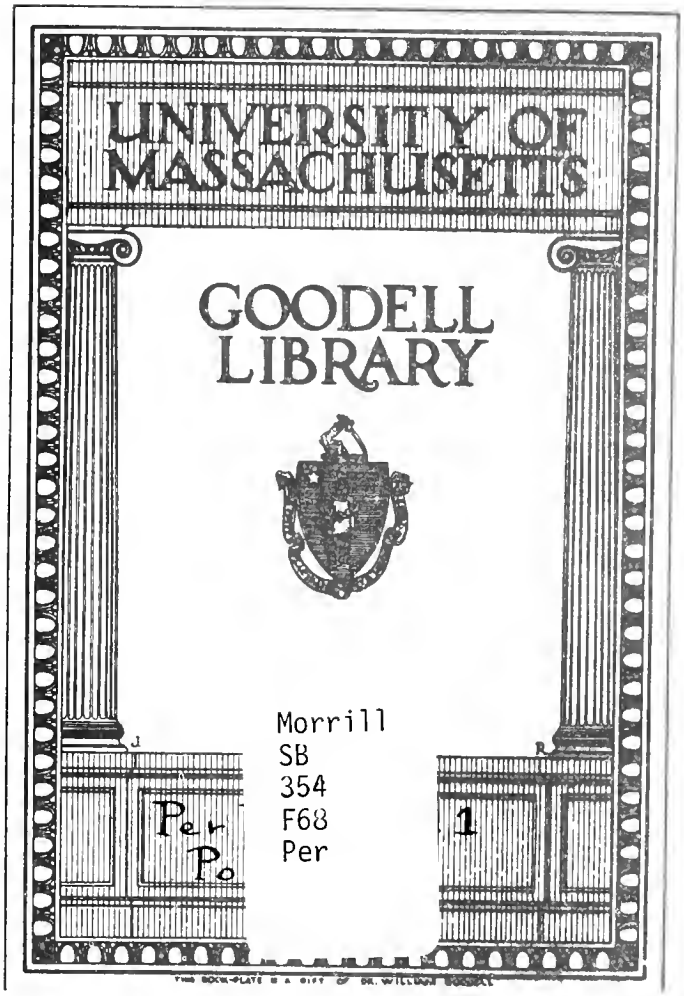
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FRUIT NOTES

JULY 1935 - NOVEMBER 1949

Extension Service
University of Massachusetts

(Set No.2)

# FRUIT NOTES

1936 - 1949 (inclusive)

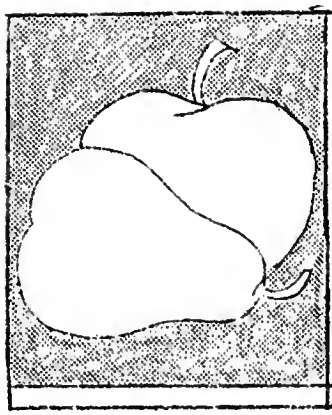
(Compiled by W. H. Thies, Extension Horticulturist)

Since 1936, this periodical has been issued by the Extension Service as a means of informing Massachusetts fruit growers on matter of current interest. Both tree fruits and small fruits have been included. The first mimeographed issue in March, 1936 was preceded by carbon copies of similar material mailed from time to time to the County Extension offices. (Two of these releases, July and August 1935, are here included).

It has been our purpose through the years to cover a wide variety of items and to have the write-ups relatively brief. Considerable attention has been given to abstracting Experiment Station reports and to the presentation of timely information. A casual survey of this material, month by month, will provide the reader with a running account of the various problems confronting the fruit grower in years past and the suggested solutions.

For various reasons, there are quite a number of missing issues in this bound volume. In several of the months no issue was prepared. In others, a demand for the extra copies exhausted the supply. The missing issues are as follows:

1936 (Jan., Feb., March, April, July, Aug., Nov., Dec.); 1937 (Aug., Sept., Oct.); 1939 (Oct.); 1943 (Aug.); 1946 (Feb., Nov.,);1947 (Jan., May, June, Sept.,); 1948 (Jan., Mar., May, Sept.,); 1949 (Jan., Feb., June, Sept, Dec.,).



# Fruit Notes

January 18, 1943

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## FERTILIZERS FOR 1943.

The following list of substitute grades of fertilizers has been announced for 1943:

| Old Grades | 1943 Grades |
|---|---|
| (1) Grades of 2% or less N. to be replaced by | 0-9-27 |
| | 0-14-14 |
| | 0-20-20 |
| (2) Grades of 3% and 4% N. to be replaced by | 3-12-6 |
| | 3-10-10 |
| | 3-12-15 |
| (3) Grades of 5% or more N. to be replaced by | 4-9-7 |
| | 4-10-10 |
| | 4-12-4 |

In addition to these grades a 3-8-7 Victory Garden fertilizer containing 2½% organic and ½% chemical N is available for use on Home or Victory Gardens. Two other grades, 5-3-5 and 6-3-6 will be available for tobacco growers.

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

## COLD INJURY TO PEACHES

The official weather bureau station at Amherst recorded a minimum temperature of -15°F. during the nights of both December 20 and 21. A minimum thermometer in one of the College peach orchards registered -17°F. on the 20th and -19°F. on the 21st. As a result, fruit buds on all but the most hardy varieties were completely killed. On such hardy varieties as Oriole, Marigold, Greensboro, and Buttercup there are probably less than 5% of live buds, in most cases only a very few, scattered over the tree. Signs are also developing that there may be considerable wood injury.

Not enough reports are available to determine how extensive the injury to peach trees has been over the state. Information from peach growers about the condition of their orchards would be welcome. It is suggested that each peach grower make a careful survey of the condition of the fruit buds and wood in his orchard. Fruit buds should be sectioned on shoots and short spur-like growths, in the tops, and around the bottoms of the trees. Also enough shoots and branches should be cut to determine the extent of any wood injury. A generous sample of trees well scattered over the orchard should be checked. Such a check-up following winter injury is particularly important before pruning is started because the kind and amount of pruning will be determined largely by the extent and severity of the injury found.

Any grower who wishes to have a sample of peach buds checked for him, may send a sample of shoots and spurs to the Pomology Department, French Hall, M. S. C. This kind of a check-up is necessarily limited and therefore not so good as one made by the grower himself right in the orchard.

J. S. Bailey

## PEACH PRUNING

It is time to be thinking about peach pruning. Under normal conditions, it would be advisable to leave the peach pruning until just as late in the spring as possible and then rush it through. By doing this, any winter injury is given as much chance as possible to show up. Then the kind and amount of pruning can be adjusted to the extent and severity of winter injury.

Because of the labor shortage, it is going to take careful planning to delay the peach pruning without delaying it too much. Also that check up of the orchard condition (see Cold Injury to Peaches) becomes even more important. If injury to the wood is severe, the trees will probably recover much better with no pruning. Thus much labor can be saved. If the fruit buds are all killed but the wood is not injured, it is a good time to lower the trees by cutting back the tops. This can be done by a few large cuts, omitting detailed pruning, thus saving labor. If there are a few live buds on the tree, the pruning should be light to save as much as possible of what will be a small crop anyway.

J. S. Bailey

The time has come when a boatload of food is just as necessary as a boatload of men or munitions. A carload of food produced in Massachusetts releases for military purposes a carload produced elsewhere.

# Do You Know:

That food production in Great Britain has increased about 50% since the war began? This increase has been attained in spite of the fact that practically all able bodied men of draft age have been taken into the armed forces.

That about 13% of our 1942 food production was used for military and Lend-Lease purposes? About a year ago it was thought that only 8 or 9% would go into those channels.

That at least 1/4 of all the food produced in the U. S. in 1943 will be used to feed our soldiers and allies? Estimates for 5 commodities are as follows: Red meats, 1/4; lard, 1/3; eggs, 1/3; dairy products, 1/3; canned fruits and vegetables, 1/2.

That about 1/3 of the people in the United States are so situated that they could be more or less self supporting? In other words, they could produce a large proportion of the food needed for home consumption.

That the last 10% increase in national food production should and can be obtained by producing for home use? Most farms can make a definite contribution to the food production program by having a garden, a few hens and one or more meat producing animals.

That if all of the new farm machinery available in 1943 could be distributed to best advantage and used efficiently, it would account for only 2%, of the needed food production? The other 98% must be produced by machinery now in use.

That the manufacture of power sprayers in 1943 is limited to 20% of that in 1940-41? It is reported that sprayer manufacturers who have 90% of the materials on hand will be permitted to purchase the other 10% to complete the manufacture of spraying equipment. There is more need this year than ever for completely overhauling present equipment, replacing all needed repair parts. Dealers in spraying equipment report many orders on hand with certain replacement parts very scarce.

That 24 of the 3070 counties in the U. S. (less than .8 of 1%) used 12% of all fertilizers put on the land in a recent year? Aroostook County, Maine, used the most, 111,446 tons spread by 4875 farmers.

That the 26,000,000 tons of manure produced annually on New York farms carry 12 times as much nitrogen as was sold in commercial fertilizers in that state in 1940? With tremendous quantities of nitrogen needed in making munitions, it is our patriotic duty to conserve farm manures and utilize them to best advantage in the food production program.

That it is the present policy of the Federal Government to support the prices of agricultural products at a sufficiently high level to encourage the production of those crops necessary for maintaining the food supply of our armed forces, allies, and our people on the home front? These crops include meat animals, oil producing crops, and the feed crops required to maintain an increased production of livestock products.

That fruit production in the United States in 1942 was the largest on record? With the exception of prunes and apricots, the 1942 crop of all major fruits was above the 10-year average. The commercial apple crop in the United States amounted to 127,655,000 bushels compared with 122,256,000 bushels in 1941.

That packing boxes and crates made in the United States in 1942 used 9,000,000,000 board feet of lumber and 200,000 tons of steel? In the State of Washington 110,000,000 board feet of lumber were required to make boxes to ship the State's 27,500,000 bushel crop of apples.

That the European red mite, which caused so much bronzing of apple foliage in Massachusetts last summer is neither a chewing, nor a sucking insect? In fact it isn't even an insect, having 8 legs instead of 6. The so-called spider mites, according to W. D. Whitcomb, wound the surface of the leaf and lap up the sap which emerges. They can feed on liquids, only, but do not have a hollow beak such as aphids through which the sap can be pumped. Instead, they have small, sharp appendages with which they pierce the tissue of the leaf.

That erosion has already ruined about 14% of the land surface in the United States? At least 75% of our cultivated area has a sufficient degree of slope to be classified as definitely subject to erosion. L. Southwick

That yield per acre is tremendously important in successful orchards today? In a Michigan study it was found that a group of "successful" growers attained an average annual yield of apples amounting to 317 bushels per acre, while a group rated as "unsuccessful," attained only 161 bushels per acre over a 3-year period. It is not enough to produce good apples. In these times, growers must produce good crops of good apples. L. S.

That from 25 to 35 million pounds of avocados are consumed annually in the U. S.? Of this amount California produces about 55%, Florida 15%, and Cuba 30%. Although this fruit is an important item in the daily diet of Central America and adjacent territory, it has achieved fame in the U. S. mostly as a salad fruit. L. S.

That a coffee substitute made from apples, dried, roasted, and ground, has been introduced in Canada? This new product sells for much less than coffee and is reported to be quite popular.

That the flesh of an apple breaks down in cooking only if an acid is present? A sweet apple, lacking the acid of a tart apple, retains its firmness and shape when cut into slices and cooked. For this reason the Delicious is less suited for apple sauce than the Baldwin.

That there are about 23,000,000 men in the U. S. between the ages of 18 and 38? Of this number it is estimated that 8,000,000 will be physically disqualified for military service. Of the remaining 15,000,000 about 10,000,000 will probably be in the armed forces by the end of 1943.

That the American Forestry Association has records of five tree species of which one or more individuals tower at least 200 feet? Tallest trees on record for the five species are: Redwood, 300; Sequoia, 272; Douglas Fir, 221; Red Gum, 200; Sugar Pine, 200. Alaska has a Sitka Spruce which measures 204 feet.

That the Agricultural Marketing Administration purchased 275,048 bushels of apples in Massachusetts last fall? Purchases involved mainly 3 varieties,- Baldwin (177,272 bu.), McIntosh (55,408 bu.) and Cortland (21,779 bu.). Nearly 8,000 bushels each of Delicious and Wealthy and smaller quantities of Stayman, R. I. Greening, Rome, Wagener, and Snow were also sold through the A. M. A. Six counties participated in the program (Middlesex, Worcester, Franklin, Hampshire, Essex, and Hampden) with sales ranging from 178,653 to 2,745 bushels.

SUMMARY OF FRESH APPLES PURCHASED IN 1942 BY THE AGRICULTURAL MARKETING ADMINISTRATION IN MASSACHUSETTS
(All Purchases on U. S. No. 1 - 2 1/4 Inch Min. Basis. Figures Represent Bushels)

Chauncey M. Rand, Purchase Representative of the Agricultural Marketing Administration in Boston, submits the following summary of the apple purchase program. Quoting from his letter of January 11, "These apples were shipped to various State Commodity Distribution outlets for school lunch programs, institutions, and direct relief. Due to limited outlets, 50,526 bushels went into storage to be used later, chiefly in school lunch programs."

| | Middlesex | Worcester | Franklin | Hampshire | Essex | Hampden | Totals by Varieties |
|---|---|---|---|---|---|---|---|
| Baldwin | 108,827 | 34,640 | 12,001 | 10,541 | 8,777 | 2,486 | 177,272 |
| McIntosh | 40,209 | 7,827 | 4,275 | 292 | 805 | -- | 55,408 |
| Cortland | 13,429 | 2,683 | 2,255 | 3,173 | -- | 259 | 21,779 |
| Wealthy | 6,123 | 995 | 532 | 215 | -- | -- | 7,865 |
| Delicious | 4,780 | 2,136 | 407 | 511 | -- | -- | 7,834 |
| Stayman | 3,100 | 12 | 100 | -- | -- | -- | 3,212 |
| R. I. Greening | 490 | 459 | 205 | 270 | -- | -- | 1,424 |
| Rome | 1,185 | 12 | -- | -- | -- | -- | 1,197 |
| Wagener | 510 | 231 | 164 | 133 | 8 | -- | 1,046 |
| Snow | -- | 11 | -- | -- | -- | -- | 11 |
| Totals by Counties | 178,653 | 49,006 | 19,919 | 15,135 | 9,590 | 2,745 | 275,048 |

An elderly farmer was heard to remark at a recent Food Production meeting, "Older men and women and children have always produced food in time of war. They will do it again."

## MAGNESIUM DEFICIENCY

Our experimental data shows that potash fertilization of apple trees may induce magnesium deficiency symptoms. This is one more possible explanation for the recent increase in the prevalence and severity of this trouble in commercial orchards in this state. It is suggested that in orchards where symptoms of magnesium deficiency have been observed, the use of potassium in the fertilizer program be discontinued, at least temporarily.

Where soils are very acid (and most Massachusetts orchard soils are), we suggest the application of high-magnesium limestone. The magnesium in limestone is only slowly available. The use of some soluble compound such as magnesium sulfate (Epsom Salts) probably will be more quickly effective in correcting magnesium deficiency, though the time required may be two or more years. Experiments along this line are underway and it is hoped that recommendations based on results of this work can be made within a reasonable time.

L. Southwick

## CITRUS FERTILIZER PROGRAM

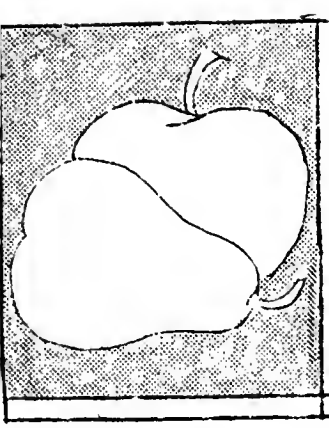
A successful citrus fertilizer program consisting of three separate applications per year is outlined in a recent annual report of the Florida Agricultural Experiment Station. The analysis of each application is as follows: Nitrogen - 3%, phosphoric acid - 6%, potash - 8%, magnesium oxide - 2%, manganese oxide - 1%, copper oxide - 1/2%. Dolomite is used to maintain the soil at pH 5.5 to 6.0, and copper-zinc sprays are applied. Thus a complete fertilizer, instead of the usual N-P-K designation, looks like this: N-P-K-Mg-Mn-Cu-Zn. There is also some evidence of isolated cases of deficiency of iron and boron. Other symptoms of malnutrition have occurred but have not been diagnosed.

No such complicated fertilizer program is required for orchards in Massachusetts. However, it is becoming increasingly evident that the program may become more inclusive as time goes on. The recent diagnosis of magnesium deficiency in apples and the previous findings of boron shortage, point the way toward a more balanced and hence inclusive fertilizer program for Massachusetts orchards.

L. Southwick

## CHANGES IN THE 1943 APPLE SPRAY CHART

The more important changes in the newly revised apple spray chart for 1943 are as follows: (1) Lead arsenate is recommended in only one of the pre-blossom sprays. Previously it was included in both the pre-pink and the pink sprays. (2) Lime sulfur no longer appears among the recommended materials. Instead, it appears as a substitute for wettable sulfur in one of the Notes. Its use under certain weather conditions may occasionally be advisable. (3) A high calcium lime appears in the list of materials for the first time. Previously the use of lime was discussed in one of the Notes. (4) As a means of controlling a severe outbreak of red mite, one of the DN materials is recommended as an emergency application.



# Fruit Notes

February 18, 1943

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## LOW TEMPERATURES AND POSSIBLE INJURY TO TREES

The official temperature in Amherst on Tuesday, February 16 (-23° F.) was the third lowest on record. Other sections of the State report unofficial temperatures as low as -40°. The second lowest in Amherst was -23½ on January 24, 1907 and the lowest was -26 on January 5, 1904. The lowest temperature recorded during the "cold winter" of 1933-34, when considerable injury to fruit trees occurred, was -22° on February 9, 1934. Have you examined your Baldwin trees or your peach trees for possible winter injury? Some observations concerning cold weather effects on fruit trees, and wartime recommendations, will be included in the March issue of Fruit Notes.

For what avail
The plough or sail
Or land or life, -
If freedom fail?

--Ralph Waldo Emerson

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

GOOD GRAPES FROM YOUR TANGLED VINE

Have you a problem grape vine? With its sprawling tangle of growth, it may look hopeless. Yet you may find the magic wand of productiveness within easy reach. An hour's work with the pruning shears, a few trellis repairs and two or three well-timed sprays or dusts will work wonders. Luscious grapes for the home table are your reward next September if you pay attention to three or four essentials.

Suitable Supports are Necessary. If your vine is already supported by a trellis or arbor, your job is partly done. It is quite impossible to keep a grape vine productive if it must attach itself to a tree or building, or if it lies on the ground. Two horizontal wires, about three and five feet above the ground, are quite ideal. An arbor is also satisfactory if the vine is well pruned each year. Whatever the support, a tangled vine can best be pruned by first cutting it loose and laying it on the ground.

Annual Pruning a Vital Factor. Fruit buds are found only on last year's growth. Pruning reduces the number of these fruit buds to a practical limit, eliminates much of the older wood and stimulates new fruiting wood for next year. A vine which has 500 fruit buds will bear larger clusters if at least 80% are removed in the pruning process. This is best done, not by trimming off the tips, but by selecting a few growths of the previous season (characterized by their lighter brown color) and by cutting the rest of the vine away. Don't be afraid to make an occasional large cut in order to remove an older portion of the vine. What we retain is more important than what we cut off. Thin the vine heavily instead of "giving it a haircut." When completely pruned it will look discouragingly thin. An amateur might consider it ruined. The real benefit from pruning, however, is seen when we compare the crop of grapes on well pruned and unpruned vines. The importance of thorough, annual pruning can scarcely be over-stressed. If pruning is properly done, in March, the current season's crop is profoundly affected, and the vine will develop good fruiting wood for the next season.

A Third Essential, - Pest Control. Few vines are highly successful without some attention to disease and insect control. The most common disease of grapes in Massachusetts is Black Rot which causes the grapes to turn brown in midsummer. Later, they turn black and dry up, resembling raisins. Copper sprays or dusts will control this disease. Powdered Bordeaux or copper-lime dust may be obtained from most dealers in spray materials. If rose bugs are numerous, special control measures are needed.

Fertilization Not Always Needed. Pruning is generally more essential than fertilizing because the average vine growing in a good soil is already sufficiently vigorous. Pruning further invigorates the remaining parts of the vine. If stimulation is needed, a garden fertilizer, barnyard manure, clean cultivation, or mulching are recommended. A mature grapevine, however badly neglected, offers promise of a crop next September, while a new vine set this spring, will require three to five years to come into bearing.

# Do You Know:

That about 1,600,000 farm workers in the U. S. left the farm during 1942? Of this number 381,000 were operators and managers and 1,234,000 were family workers and year-round hired workers. Industry took 921,000 and the armed forces 694,000.

That certain materials applied to pruning wounds do more harm than good? Shellac is satisfactory. So is white lead paint. Bordeaux paste is very efficient in preventing wood rot but lacks permanency. Compounds containing creosote tend to injure the cambium, and therefore retard healing.

That fewer apples were shipped to the Boston market from out of state up to January than in any year on record? The total volume was at least 10% more than last year and was divided approximately as follows: home grown apples, 650,000 bushels and shipped-in apples, 125,000 bushels.

That wood ashes are an excellent source of potassium and lime? Chemical analyses show that they contain approximately 5% potash, 2% phosphoric acid and an acid neutralizing equivalent amounting to 66% of a high grade agricultural limestone.

That the average water content of apples is 84.1%and that the average freezing point is 28.4° F.? For long storage life, the ideal storage temperature is 31 to 32° F., and relative humidity at least 85 to 88%. The harvested apple is a living organism with a more or less definite span of life. If it "lives too fast," either before or after picking, the time it remains in good eating condition is shortened proportionately.

That fruits develop considerable heat during the ripening process? Apples held at 32° F., generate about 660 b.t.u. per ton per day (a b.t.u. is the amount of heat required to raise the temperature of one pound of water one degree F.). At 85° F. about 6600 b.t.u.'s per ton per day are generated. For Bartlett pears, the difference in heat generated at the two temperatures is even greater. This so-called heat of respiration is a direct measure of the rate of ripening.

That apples are a more expensive crop to grow and market in dried form than either plums and grapes? Apples must be dried artificially. Raisins and prunes are the result of drying in the sun. This is one reason why raisins can be produced for as little as 5¢ per pound.

That 80% of the 12 million bushel apple crop in Wenatchee County, Washington was harvested last fall by local people? Schools opened three weeks early to permit closing during the harvest season. Stores closed part

of the week and many local people who had not handled apples previously, including wives of business men, did their share in picking and packing the bumper crop. In the same way, New England apple growers must utilize to the fullest extent all nearby labor resources instead of hoping for an influx of migratory labor.

That as many as 450 European red mite have been counted on a single leaf? In one orchard the average on 100 leaves was 225 per leaf. The new DN material was tried in New England last summer by six investigators in six different localities. In a series of 22 tests the average reduction in number of mites amounted to 97%.

That the root of a tree is more spongy in texture and lighter in weight than a branch largely because it has relatively more vessels and fewer fibers? The root functions mainly as a conductor of materials in solution. The branch must also be strong enough to withstand high winds and support a heavy crop of fruit.

That February is an ideal time to (1) overhaul farm machinery, (2) make further progress in pruning and removal of unwanted trees, and (3) order fertilizers, seeds, and other supplies?

That the large average size of apples in Massachusetts last fall was not entirely due to abnormally heavy rainfall during the growing season? A study of daily weather records up to harvest time indicates a fairly good distribution but not an excessive amount of rainfall. At the same time weather conditions preceding McIntosh harvest were apparently highly favorable for fruit swelling. Higher than normal humidity and more hours of sunshine previous to harvest time may have influenced the size of fruit. About 70% of the McIntosh crop in storage is reported to be 3 inches in diameter or larger.

That apples and field mice are common items of food for foxes? In a study of the food habits of 289 red and gray foxes taken during the winter season in New England, it was found that 128 (44.2%) had eaten apples, while 83 (28.6%) had eaten field mice. These two items of food were exceeded in popularity only by cottontail rabbits. It was found that 173 (59.8%) had eaten rabbits.

That the use of fresh, native grown fruits and vegetables in Massachusetts this year has released more than 35,000 refrigerator cars which otherwise would have been required to haul this class of food products into this area?

That raw apple is sometimes beneficial in the diet of an infant? In the Mich. State Hort. Soc. Rept. (1939) we find this statement, "Investigations have found the raw apple diet successful with infants less than 6 months of age."

That it requires more than 3 times as many peaches of 1 3/4 to 2 inch diameter to weigh 50 lbs., than of 2 3/4 to 3 inch diameter? Of the smaller size, 340 peaches are required, and of the larger size only 110.

(Note: Any large orchard owner interested in an unusually well qualified manager, now available, should communicate with H. A. Rollins, Extension Horticulturist, University of Connecticut, Storrs, Conn.)

## RUSSETING OF GOLDEN DELICIOUS

The tendency of fruit of the Golden Delicious apple to russet is one of the weaknesses of the variety. It makes the fruit less attractive and is related to its tendency to shrivel in storage. Russeting seems to be worse in the humid East than it is in the less humid or semi-arid regions in the West. From Maine comes a suggestion that there may be another factor involved. Observing differences in individual trees, scions from high russet-trees were grafted into trees with low russeting and vice versa. Under Maine conditions there seemed to be a persistency in the new location, of the tendency to russet. If you have any individual Golden Delicious trees that seem especially free from russet, the writer would be glad to know about it. It would do no harm to propagate from such trees. --J. K. Shaw

## RELATION BETWEEN DATE OF BLOOM AND DATE OF HARVEST

A recent discussion of the time of ripening of fruit varieties advances the idea that the date of full bloom gives a basis of calculating the date of harvest. The data for some of our principal varieties are as follows:

| | Days from Bloom to Harvest | | |
|---|---|---|---|
| | Shortest | Longest | Average |
| Baldwin | 134 | 138 | 135 |
| Cortland | 125 | 130 | 128 |
| Delicious | 129 | 134 | 132 |
| Early McIntosh | 88 | 94 | 90 |
| Golden Delicious | 132 | 140 | 138 |
| Gravenstein | 110 | 120 | 114 |
| McIntosh | 124 | 129 | 127 |
| Northern Spy | 138 | 144 | 143 |
| Wealthy | 103 | 116 | 109 |

This means that Baldwin, for example, will be ready to pick about 135 days after full bloom. Doubtless summer temperatures and cultural conditions modify this interval; a season warmer than usual will shorten this period and high nitrogen will lengthen it. These data are for Geneva, New York. The interval may differ somewhat for Massachusetts and would not be exactly the same for different parts of the State. However, it seems worth while for a fruit grower to note the date of full bloom and consider it in planning the date of harvest. --J. K. Shaw

## PLANNING FOR THE NEW ORCHARD

If you are planning to set a new orchard this spring, the first thing to do is to see that the site and soil are suitable. Since this is a fairly long-time investment that you are about to make, these two points are highly important. Second, why not consider contour planting of the orchard?

There are several possible advantages of contour planting of orchards and, frankly, one or more disadvantages. Among the advantages are

the holding of soil, fertilizer, and moisture, and the saving of tractor fuel. A disadvantage is a restriction in the movement of heavy implements through the orchard, which can be only on the contour or level and not up and down the slope. But this restriction frequently develops in orchards on sloping land after a number of years whether or not they were planted on the exact contour. It is not uncommon to see old orchards in which crude bench terraces have developed, which practically prohibit movement of vehicles and implements up and down the slope. Then, why not plant on the contour and have these terraces develop in the right way?

The possible saving of soil and fertilizer on cultivated sloping land is obvious. But it is frequently pointed out that orchards, especially apple orchards, are now kept in sod and therefore would not benefit from contour planting. However, young apple orchards are often cultivated during the first few years of their development, and during that period they stand to benefit from the conservation of soil, fertilizer, and moisture, and later when in permanent sod they may benefit from the saving of moisture and fertilizer. In about one out of every three or four years additional soil moisture will improve the crop. There is a terraced peach orchard at the Massachusetts State College. Within a dry spell in the summer of 1940 the soil in this orchard was found to contain a little more than twice as much moisture as was found in adjoining land which was not terraced. Practically all the rain that fell during the dry spell came in flash showers and was held on the terraced slope, whereas much of it ran off the non-terraced slope.

Contour planting of orchards is comparatively simple and easy. If interested in this method, consult your county agent, the extension horticulturist, or the undersigned.

--A. B. Beaumont

## LIME AND MANURE

"Lime and lime without manure, make both farm and farmer poor," is an old rural proverb that expresses a basic truth. Both materials or their equivalents are needed to build and maintain fertility. They are most commonly added to the soil separately, and that is the most fool-proof method of application, but now that farm labor is one of the biggest problems of production the question may well be asked if these two soil amendments may not be spread together.

Some pertinent data bearing on this question have come recently from the Vermont Experiment Station. They show that ground limestone may be mixed with both fresh and fermented cow manure with scarcely any loss of ammonia. Caustic lime caused no loss in fresh manure, even lessened it in some cases by delaying ammonification; but it did expel some ammonia from fermented manure. Even in the latter case the authors of the report think that the saving in time and labor may offset the loss of ammonia.

Perhaps the most important factor in saving the ammonia of manure is moisture. At 20° C. a given volume of water will dissolve about 700 volumes of ammonia gas. If manure is kept well moistened there is little danger of ammonia loss, but if it is allowed to dry, lime or no lime, the ammonia loss may be considerable. This point emphasizes the value of plowing under

of harrowing in manure as soon as possible after applying, or of spreading it in rainy weather. Both forms of lime, but particularly the caustic form, accentuate the loss of ammonia on drying. Superphosphates on the other hand, particularly the lower grades containing 18 to 20% of phosphoric acid, retard the loss of ammonia by fixation. Gypsum, which makes up a considerable proportion of the low-analysis phosphates, chemically absorbs ammonia under certain conditions. --A. B. Beaumont

## MORE ABOUT COLD INJURY TO PEACHES

Since the last report in Fruit Notes, a few peach growers have sent in reports which indicate very close to a complete crop failure in Massachusetts. Occasionally an orchard has 5 or perhaps 10% of the fruit buds alive. (This statement was written before the cold spell around Feb. 16.)

Two growers have reported wood injury. Further observations at the College revealed only slight injury to the tops, but severe injury to the trunks of some trees. In these injured trunks the cambium and outer sapwood were brown. In a few, the bark also had been injured.

Since the trunks of the trees are the last part to "harden off" in the fall, they are especially susceptible to winter injury following a late warm fall, such as occurred in 1942. Last fall the trees were kept growing later than usual and the "hardening off" of the trunks was delayed. The cold spell of December 20 and 21 caught the trunks only partly "hardened off," and injury resulted.

Peach growers will be wise to look for trunk injury and keep close watch of any injured trees for they will probably need special treatment later. A small elliptical piece of bark cut from the trunk will reveal what has happened and probably do the tree little harm. --J. S. Bailey

## PRUNING WINTER INJURED PEACH TREES

It is becoming increasingly evident that most peach orchards will have no crop this year. Therefore, in those orchards without a crop, now is a good time to lower the tops of any trees which are becoming too tall. Any branches which are too long and rangy should be cut back. Cutting to a side branch in two or three year old wood will reduce the tendency to sucker. After all weak, injured and dead wood is removed, further thinning should be done if necessary.

In orchards where there are still live fruit buds, a thorough checkup is desirable to find out where these buds are. Then the parts of trees, or parts of the orchard, which show signs of bearing some fruit should be left unpruned so as not to cut off any part of the small crop. The rest of the orchard should be given a light but thorough thinning out.

If the wood of top or trunk has been injured, a light but thorough thinning out will induce plenty of new wood to form fruit buds for next year. Trees which have had their wood severely injured had better be left unpruned. They usually recover better that way. However, they will benefit from light fertilization and good care through the summer. --J. S. Bailey

## ORDER BEES EARLY

According to the latest advice received, shippers of package bees are experiencing some difficulty in getting necessary supplies for shipment cases. It appears likely that the number of packages shipped will be below normal. Beekeepers who intend to use package bees are advised to order early. Fruit growers who rely on package bees for pollination should take this advice and act on it.

It is very likely that losses of overwintered bees will be larger than usual. This, together with the shortage of package bees that may be anticipated, makes it essential that arrangements for securing bees for pollination be completed early.

--F. R. Shaw

## SALVAGE AND RE-USE OF FRUIT AND VEGETABLE CONTAINERS

General Lumber Situation. The users and suppliers of lumber in 1942 were caught in a squeeze because of increased demand for lumber as a result of the larger amounts necessary for military uses and to decreased production which resulted from labor and equipment shortages. As a result of the increased demand, the estimated consumption of lumber in 1942 went up 11% over that of 1941. Also in 1942 the production of lumber failed by about 20% to equal consumption. The deficit was made up by imports and by withdrawals from inventories. This drain upon supplies has now depleted the stocks of lumber to about 50% of normal. Considering the fact that the inventory reserve represents a wide variety of sizes, species, and grades, this small stock represents a very small supply for emergencies in 1943.

By exercising the severest restrictions, it is estimated that consumption in 1943 can be held to a little over 31 billion board feet, which is about 25% below the consumption of last year. Although it is possible to reduce the lumber consumption for certain uses during 1943 from that of the past year, increases for other uses will be inevitable. These are chiefly for boxes and crates used as containers for products shipped overseas. Other military requirements, such as construction, are expected to drop. It may be necessary to restrict civilian construction this year to about one-half that of last year and to about one-third of that of 1941. This restriction would eliminate all but the bare essentials of construction and maintenance. Even with this restricted use, however, it is possible that labor, equipment, tire and replacement problems may reduce the 1943 production and imports below the requirements of these minimum essentials, and thus make further inroads upon the already scanty lumber reserves by the end of 1943. This makes any program for conserving lumber during the current year of vital importance.

Fruit and Vegetable Containers. The total estimated minimum essential requirements for containers and shipping material, such as boxes, crates, etc., has increased about 30% for 1943 over the consumption of 1942. Most of this increase has been for military shipments. Some materials are being packed in wood containers because of the scarcity of other package materials such as metals. Other types of supplies are being put in wooden packages in order to secure a more substantial container for overseas shipping.

Fruit and vegetable producers will likely be able to get along with a slightly smaller quantity of wooden containers in 1943 than was the case in 1942. Assuming 1942 packing practices and per-acre production, and the 1943 goals, the total number of board feet of lumber to package the 1943 crop will be about 1% less than that required in 1942. This will probably be further reduced through the use of containers of substitute materials and limited shipments of products in bulk. However, these adjustments cannot be sufficient to offset possible shortages of container material and increased container demands for military shipments, and thus avert a tight package situation.

Used Containers. One method of supplementing the tight fruit and vegetable container situation is by the careful salvaging and reuse of second-hand packages. Every salvaged used container made available for reuse makes a number of contributions to the general supply situation and the war effort. One of these is the fact that this container may package a product which may, in an acute container situation, not be made available to consumers. Another, the use of the salvaged package will release to other uses labor and equipment which would be necessary to make another new box or basket. In addition, it will release such critical materials as wood and metal to be used in other war activities. The salvaging of used containers offers real possibilities. For instance, there are enough board feet of wood in 1,000 salvaged apple boxes to crate an average airplane for overseas shipment. There is enough metal in 60 wire-bound orange boxes to supply the nails and straps for crating a jeep for overseas shipment. One thousand wire-bound citrus boxes have about 500 pounds of metal. Thus, if a quarter of the 18 million new wire-bound citrus boxes used each year were salvaged and reused, it would release 2,250,000 pounds of metal to be used for such vital war activities as the making of shells, tanks, and guns. This saving also benefits the fruit and vegetable growers as difficulties are being experienced in securing supplies of wire and nails for packages.

Extensive work is already being done in salvaging used containers in certain large markets. A recent survey by the War Production Board indicates that approximately 25% of all wooden fruit and vegetable containers which are shipped into New York City are salvaged. This varies greatly among the various types of containers, the percentage being very high for such packages as baskets and much lower for nailed boxes. This custom seems to be general. Used or second-hand containers are more extensively used by growers in the nearby or market garden areas than in the distant producing districts because of the difficulty and expense of shipping used containers to distant producing centers. Thus, crates, baskets and other packages which are shipped into the large consuming centers are salvaged and sold to growers in the nearby producing districts. Some estimates indicate that as much as 60% of the vegetables grown in the Chicago market garden area are marketed in second-hand containers. The proportion, of course, becomes less as the distance from the city increases, but information recently collected by Cornell University indicates that growers in some of the interior counties of New York State are depending on used containers for as much as 35% of their total package requirements.

In the larger cities used containers are collected by a number of agencies. Farmers who live in the nearby districts collect a portion from

the retail stores direct. Many peddlers collect the empty containers from retailers and restaurants. Second-hand dealers or "junkies" arrange with trash collectors to separate the containers and scrap pieces from the other material. The largest group collecting used containers consists of chain stores. Used package dealers buy containers from the "junkies," peddlers, and chain stores and sort them into the various types. These dealers also repair damaged packages and remake others into types more generally in demand. The dealers resell these sorted and repaired packages to farmers in the nearby districts, or to large second-hand wholesalers who may distribute them into the market garden districts of adjacent cities or to other production centers.

The remaking of other types of containers from such packages as orange and apple boxes has become an established business in the larger cities. From material in these boxes, crates are made for the packing of cabbage, beans, carrots, onions, and other vegetables. Reconditioning, as well as remaking, is an important enterprise. Reclaimed pieces of containers, second-hand nails and wire are used to repair damaged hampers, baskets or covers. A second-hand wire handle, a bent nail or two, with a salvaged slat, will many times restore a useless damaged container to good condition.

In addition to collecting, remaking and remodeling, careful handling by all dealers all along the line to prevent needless damage is important. Many parts of potentially good containers which might be used are thrown on fires in the markets on cold mornings. Attention to all of these factors in regard to used containers will increase the supply of fruit and vegetable packages and permit the use of material, which would otherwise be required for new containers, to be used for other vital uses. Therefore, the program which is operating rather smoothly in the large cities should be expanded and similar types should be developed in the smaller centers.

## THE VICTORY TAX

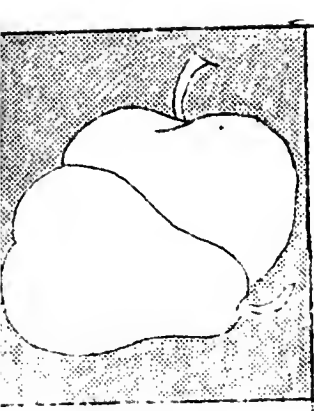
H. P. Gilmore of Westboro submits the following joint ruling recently issued by the Bureau of Internal Revenue and the War Labor Board.

"(1) The payment by an employer of the five percent Victory Tax on behalf of his employees without deducting it from the employees' pay is a wage or salary increase requiring the prior approval of the Board or the Commissioner pursuant to Executive Order No. 9250 and the Regulations of the Director of Economic Stabilization.

"(2) On January 23, the Commissioner of Internal Revenue issued a ruling interpreting the Revenue Act so that where the National War Labor Board or the Commissioner of Internal Revenue awards or approves an increase in wages or salaries retroactive to 1942, the tax need not be withheld on that portion of the increase which is applicable to work performed in 1942.

"(3) Whether the five percent tax will ultimately be collected on such retroactive pay is a matter to which the Congress may give its attention during the current session."

Quoting from Mr. Gilmore's letter, "Apple growers are not required to deduct and pay the Victory Tax, but our employees are required to pay it at the end of the year."



# Fruit Notes

March 24, 1943

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## THE FRUIT GROWER AND THE FOOD PRODUCTION PROGRAM

Fruits are recognized as an essential part of our diet. In dried form they are an important item of food for our armed forces abroad and for our fighting allies. Fresh fruits, being less easily exported, contribute in a similar way to our food needs here at home. Every good fruit grower has reason to feel that he is making a contribution to the food production program. This applies to the commercial fruit grower and to the producer of fruits for home use as well.

Whatever we grow of necessary foods, near the point of consumption, releases transportation facilities for vital use elsewhere. A carload of good apples grown on a hillside farm within easy trucking distance of Boston,

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is directly in line with our wartime economy. It would be folly for the owner of a good apple orchard to go into some other line of business and neglect the orchard. The experienced fruit grower can make his greatest contribution to the war effort by taking the best possible care of his fruit planting. If every fruit farm utilizes its resources to best advantage, there will be no need of transporting from other producing areas, the fruits needed for home consumption. Most of our needs along fruit lines can be supplied from the New England area.

We are constantly being reminded that American farmers must produce more food. From the standpoint of the fruit grower, this does not mean more bushels, without regard to grade or quality. We already have too many "cull" apples. In the writer's opinion, our job is to produce, not more apples, but more good apples. We should aim to produce an apple crop of which at least 90% will grade U.S. No. 1 or higher. Apples of lower grade are of doubtful value, even in peacetime. They become a liability in wartime when storage facilities, packages, labor, etc., are scarce. We ought not to clutter up our markets or our storages with fruit fit only for feeding to livestock.

What should be the attitude of the home gardener who is interested, not in producing fruit for sale, but for the home table? Again it should be pointed out that the owner of a small piece of land should concentrate first on vegetables, and should expand to include small fruits only if garden space and time are available. Small fruits offer much more promise of success for the backyard gardener, than tree fruits. We cannot afford to waste valuable land, fertilizers, spray materials, etc., without reasonable assurance that the investment will produce something of real value. The producer of fruits for home use should consider very carefully the factors upon which success in the home fruit planting depends. Patriotism does not demand that we spend time and money in trying to produce usable apples on an old tall tree, when the same area might produce an abundance of strawberries or of vegetables with less expense.

Massachusetts fruit growers are doing more long time planning than ever before in order to economize on labor, materials, and equipment. The food production program will be a success from both the commercial and the home garden standpoint if we limit ourselves to those food crops within reach of our available resources. By so doing, the fruit grower will make his biggest contribution to the national food production program.

## ORCHARDS DAMAGED BY SEVERE WINTER WEATHER

If a definite relationship between winter temperatures and injury in plant tissues were to exist, we would expect heavy damage in Massachusetts orchards as a result of the near record cold spell around February 16. The extent of injury, however, is dependent upon the maturity of the tissues and perhaps upon the date and duration of the damaging temperatures. The injury in Baldwin trees this winter, although very noticeable, does not seem to be as severe as in the winter of 1933-34. A partial killing of the sapwood is apparently more common than damage to the bark and cambium. As more Baldwin trees are examined we are finding considerable browning of the sapwood, particularly in the lower limbs. In most trees, however, there seems to be enough

sapwood to enable the tree to outgrow the damaged condition. The pith of the twigs and spurs, where part of the food materials are commonly stored, shows rather severe damage. Much less loose bark is in evidence on apple tree trunks than in 1934.

Not until the end of the 1943 growing season can we make anything like a reliable estimate of the extent of damage in Massachusetts orchards. It will probably vary tremendously in individual trees, and no one cultural practice will facilitate recovery. Winter injured trees cannot be "pruned into a normal condition." They may be better off with little or no pruning. Mulching will be beneficial, and if the cambium, inner bark and sapwood are reasonably intact, added nitrogen or perhaps strip cultivation will tend to encourage the development of new tissues.

In the College orchards severe injury has been observed on sweet cherry trees. Some of them are apparently beyond hope of recovery. Peach trees also show unmistakable damage. A no pruning program for such trees is strongly recommended. Only time will tell which trees or parts of trees are capable of making satisfactory growth and (barring another cold winter) of bearing a crop of peaches in 1944.

## "READY TO BEAR" FRUIT PLANTS

Whenever we consider buying fruit plants which, according to the claims of the nursery, will "bear the first season," we ought to ask ourselves whether such performance is an advantage or a disadvantage. Is the apple or two, borne the first year, of prime importance? Should we look forward to harvesting a few strawberries a month after setting the plants? In general, is early bearing conducive to success in a fruit planting? The answer is definitely "No."

All blossoms should be removed from newly set strawberry plants because any berries borne the first season will endanger the growth of new plants for next year. A strawberry plant cannot mature berries and at the same time develop strong runner plants, since the same raw materials are required for both. Raspberry plants should be cut back to a height of 6 or 8 inches at planting time in order to prevent fruiting, and thereby encourage a strong growth of new canes. Otherwise, the crop of fruit will so tax the root system until midsummer that the growth of new canes for next year will be retarded. Only a severely stunted or a true dwarf apple tree can be expected to bear the first year. If the tree does bear so early it is a sure sign that it is making very scanty growth.

With few exceptions, a fruit plant needs the first season to become established and to make vigorous vegetative growth, instead of exhausting its food resources in bringing fruit to maturity. If we focus our attention on early bearing, and overlook the kind of growth necessary for future production, we are horticulturally shortsighted.

TAKE GOOD CARE OF YOUR SPRAYER. YOU MAY NOT BE ABLE TO REPLACE IT FOR SEVERAL YEARS.

## ACTUAL FIGURES FROM A CONNECTICUT FRUIT GROWER

The following figures are taken from Seasonal Fruit Notes, prepared by H. A. Rollins of the University of Connecticut: Apples grown in Connecticut and sold in New York City, January, 1943 -- Consumer A paid 5¢ per lb. for Utility Grade apples or at the rate of $2.00 per bu. Consumer B. paid 8¢ per lb. for Fancy Grade apples or at the rate of $3.20 per bu.

| | Utility Grade per bushel | | Fancy Grade per bushel | |
|---|---|---|---|---|
| Retailer paid (retailer plans for 50% mark-up) | | $1.33 | | $2.15 |
| Wholesaler received for handling | .08 | | .08 | |
| Jobber received for handling | .05 | | .05 | |
| Jobber paid for cartage to N.Y.C. | .20 | | .20 | |
| Jobber paid for complete package | .30 | | .30 | |
| | | .63 | | .63 |
| Grower received | | .70 | | 1.52 |
| Grower storage costs | .30 | | .30 | |
| Sorting and packing | .10 | | .10 | |
| Harvesting and handling | .15 | | .15 | |
| | | .55 | | .55 |
| Value of bushel of fruit on tree | | .15 | | .97 |

You may understand why this fruit grower feels that he should make every effort to prune, to fertilize and especially to spray his trees to produce good quality fruit in 1943. Would you rather grow Utility grade apples for 15¢ than Fancy apples at 97¢ per bushel?

## TIMELY NOTES ON THE BEE SITUATION

Since fruit growers are vitally interested in bees for pollination, the following summary of the bee situation by F. R. Shaw of the Dept. of Entomology, is presented: Massachusetts beekeepers are faced with greater responsibilities now than at any time in the recent past. They must keep their colonies at maximum strength in order to produce the wax and honey necessary and have adequate pollination of our fruits and many vegetables. Last year we were asked to double the honey crop. We failed to do this partly due to the season and partly due to the fact that many colonies were not properly attended to because of lack of time and other reasons. This year we are asked to increase the amount of honey produced, to increase the supply of beeswax by one third and we may be faced with additional demands for bees for pollination, especially in view of the increase of Victory Gardens.

In view of the greater responsibilities facing the beekeeper, better planning will be necessary during the coming year. Bee supplies are limited. A quota of 57% has been established for hives and 38% for other supplies based on the manufacture of hives and supplies during 1940 and 1941. This makes necessary more careful checking of equipment. It would be well to have replacements on hand before discarding any old equipment. If you must secure new materials, place your orders as soon as possible.

Package Bees. Package bee shippers are faced with the difficulty of obtaining wire cloth, tin feeding cans, and sugar. It is entirely possible, therefore, that shipments of package bees may be below normal this spring. If you plan to use package bees, it will be necessary to place your orders early.

Price Ceiling on Beeswax. It is of interest to note that a price ceiling has been placed on beeswax and this was issued as of November 13, 1942. A cash price of 41.5 cents per pound or 43.5 cents per pound in exchange for supplies is the maximum allowed for crude domestic beeswax.

Early Examination of Bees Desirable. Due to the difficulty experienced by some in securing sugar for feeding together with the presence of a large amount of honeydew stored last season, it can be expected that the winter loss of colonies may be above normal. Colonies found to be low in stores can be fed or doubled up with other colonies having more food. If the colonies are low in pollen, soybean flour containing not over 5% fat can be given as a substitute.

## AGRICULTURAL INSECTICIDES FOR 1943

Although smaller supplies of some insecticides may be obtainable this year due to the war, the nation's farmers will still be able to carry on a suitable insect control program if conservation and substitution practices are followed. The following report is based on a study made by the Food Requirements Committee (now Food Advisory Committee) of which Secretary of Agriculture Claude R. Wickard is chairman. Insecticides included in the report are arsenic, cryolite, rotenone, pyrethrum, nicotine sulfate and copper.

The only real shortages, the Committee points out, exist in the supplies of rotenone and pyrethrum. Estimated supply of rotenone is placed at 3,600,000 pounds with 1943 requirements likely reaching 4,225,000 pounds. A supply of 16,000,000 pounds of pyrethrum is on hand but 17,250,000 pounds of this insecticide will probably be needed this year. Supplies of arsenic, cryolite, nicotine sulfate and copper chemicals seem to be sufficient, or the possibilities of increasing the 1943 output is believed good enough to assure adequate amounts of these materials for use as insecticides. It is believed that some of these chemicals, particularly nicotine sulfate, will serve as substitutes for some of the scarcer ones. Estimated requirements and supplies of the following insecticides for 1943 are given in tons: arsenic, 70,800, 70,800; cryolite, 6000, 9000; nicotine sulfate, 2350, 2400; and copper chemicals, 102,500, 105,000.

State and county U.S.D.A. War Boards are urged to assist farmers in the selection of insecticides and to request them to use smaller amounts of the more critical materials and to substitute wherever possible. Virtually all insecticides have been placed under W.P.B. control and most of them have been restricted to use for agricultural crops only. In case of some chemicals such as rotenone and pyrethrum, W.P.B. controls permit their use on just certain specified crops. For example, rotenone, in accordance with the W.P.B. regulation, can only be used in the protection of food crops other than citrus fruits, cotton, tobacco, cranberries, eggplants, cucurbits, onions, peppers, sweet corn, or as a spray, wash or dust in the treatment of cattle for the destruction of grubs. O.P.A. regulations place most insecticides under certain price

ceilings which seek to protect the farmer, supplier and manufacturer from possible fluctations in price due to the scarcity of supply.

Arsenic trioxide, from which all arsenicals are derived, is used chiefly in the control of pests on apples, cotton and potatoes. Cryolite is used to combat apple pests in the Northwest. Rotenone is the principal insecticidal constituent of timbo, barbasco, cube and derris root. It was formerly used in the control of many different kinds of pests. However, its use is now restricted to certain crops. Pyrethrum is the active ingredient of sprays, washes, powders and dusts used on certain vegetable crops and on livestock. Nicotine sulfate is widely used, and this year it must help supplant the shortage of other materials.

## SHOULD INSECTICIDES AND FUNGICIDES BE RATIONED?

In view of the situation concerning coffee, sugar, and many other commodities, this seems to be a logical question. In a recent issue of A.I.F. News, these points are brought out: To ration a thing - to limit each consumer to so many ounces a week - there must be enough so that each consumer actually can find and buy that many ounces. If insecticides and fungicides were rationed on any conceivable basis, no grower facing a real attack by insects or plant disease would get enough. And those fortunate enough to escape would not need even the amounts alloted to them.

There are more than enough of agricultural insecticides and fungicides for average needs, even though not enough to ration. Insecticides and fungicides are most vitally needed when insects or plant diseases appear - and when these emergencies come, they are needed in quantities large enough to control the pests. Using not enough is money thrown away, a total loss.

Fire fighting is a good parallel. A city would not think of rationing fire equipment, stationing so much apparatus and so many firemen in each block. Instead, apparatus and firemen are concentrated at strategic points, ready to rush to the places where fires break out. Those places are largely unpredictable - like plant pest outbreaks.

When the boll weevil is on the march, the embattled grower may use 15 pounds of calcium arsenate to the acre. Suppose this material were rationed to provide 15 pounds for each of the 25,000,000 acres of cotton. That would require 375,000,000 pounds. Yet the greatest amount of calcium arsenate ever produced and consumed in a year was 70,000,000 pounds. The annual consumption may run as low as 20,000,000 pounds. The same situation applies to many other spray and dust materials.

## CRITICAL SITUATION REGARDING WOOD FIBRE SHIPPING CONTAINERS

The War Production Board recently released information stating that in order to purchase any empty, new or used boxes, crates, cases, barrels, kegs, kits, pails, drums, tubs, baskets or hampers, either setup or knocked down, made either fully or in part from wood or corrugated or solid fibre, and used

as an outer container for delivery or shipment of materials, or any shooks, cleats, staves, headings, veneer, plywood or corrugated or solid fibre cut to size for shipping containers, preference ratings are needed.

There are five preference ratings, namely, AA-1, AA2X, AA3, AA4, and AA5. AA-1 preference rating is for defense material; AA2X preference rating is for the Lend-Lease Program. The other ratings are to be used by individuals ordering boxes from their usual sources of supply. However, if any of the AA1 or AA2X ratings are ahead of the others, then there is no possibility of one getting boxes for some time to come.

It is suggested by officials of the War Production Board that individuals desiring complete information in regard to these preference ratings (Order P-140), should confer with their local War Production Board. Quoting from this Order:

The list of fruits and vegetables with AA-3 rating is as follows: Dried apples, dried apricots and dried peaches. Fresh fruits and vegetables as follows: apples, apricots, bananas, cherries, citrus, grapes, nectarines, peaches, plums, pears, prunes (fresh), berries, beans (snap and lima), carrots, peas (fresh green), and tomatoes. The list with AA-4 rating includes cranberries, quinces, and most vegetables not listed under AA-3.

This Order nearly precludes the possibility of obtaining boxes through the usual channels. However, the War Production Board says that it is permissible for an individual to cut his own logs and have them sawn into lumber. Boxes for his own use can be manufactured from this lumber without securing a preference rating.

---R. B. Parmenter

## THREE APPLE BOXES - WESTERN, MICHIGAN, EASTERN

A General Limitation Order affecting wooden containers was filed March 1, 1943 by the War Production Board. This reduces the number of wooden boxes and crates for fruits and vegetables to 64. Three apple boxes remain, the Western Box, $10\frac{1}{2}$ x $11\frac{1}{2}$ x 18; the Michigan Box, 11 x $12\frac{1}{2}$ x 16, and the Eastern Box, 1 1/8 Bushel, 11 x 13 x 17, all inches, inside measurements. No half bushel boxes are left for apples.

A pear box, $8\frac{1}{2}$ x $11\frac{1}{2}$ x 18 and the half pear box, $5\frac{1}{2}$ x $11\frac{1}{2}$ x 18, are both provided for; also a pear lug, $6\frac{1}{2}$ x $13\frac{1}{2}$ x 20 5/8. Use of a cleat to increase the capacity is permitted on the pear lug but not on the other boxes.

The manufacture of boxes of other sizes is forbidden on and after March 4, 1943. Those having supplies on hand or other types of packages may manufacture same until May 31, 1943, and those receiving shooks which are already in transit, bought and received prior to April 1, 1943, may assemble such packages provided the work is completed by May 31, 1943.

Hampers, baskets and berry cups at present being manufactured are continued of certain definite sizes, which includes the bushel hamper and the bushel basket. Certain special containers for use by the Government are permitted.

## APPLE BOX REQUIREMENTS IN THE N.Y.-N.E. AREA

A survey of the apple box requirements in the N.Y.-N.E. area indicates that 9,500,000 new boxes will be needed. Fruit societies and state officials present the following estimate: Maine - 600,000, N.H. - 600,000, Vt. - 350,000, Mass. - 2,000,000, R.I. - 100,000, Conn. - 428,000, N. Y. - 5,433,500. Total - 9,511,500. Allowing a keg of nails per 1000 boxes, about 9,500 kegs of nails will be needed. The National Apple Institute has been given these figures to present to the War Production Board.

## VICTORY GARDENS

The Victory Garden is the very spot on which a major conflict of the war is being decided - the battle for food, health, and security. All indications are that this is another battle that is going to go the right way during the coming months. According to reports there were around 15 million Victory Gardens last summer. Quite a few of them were on farms that had never before grown a garden.

As you no doubt know, the 1942 Victory Garden campaign was a success in part because it was aided by extremely favorable weather. To come up to last year's record the 1943 Victory Garden campaign calls for bigger and better gardens and more of them. Many of these gardens will have to produce all the vegetables, particularly tomatoes, leafy green vegetables and yellow vegetables needed for the family's entire yearly needs. Our armed forces and our allies have already spoken for over half of our 1943 output of canned vegetables.

How true is the statement of the famous general who said, "An army travels on its stomach." A soldier needs plenty of food if he is to do a good job of fighting. We on the home front need plenty of food, if we are going to produce food for the soldiers and if we are going to produce the munitions and machines which the soldiers need for winning battles. Yes, all of us with plenty of food under our belts can do a much better job.

In 1942, war activities took 13% of our total food production. In 1943 it is estimated that these same war activities will take 25%. Twenty-five per cent amounts to one meal in every four. Now that doesn't mean that we will be short of one meal out of every four. By rationing we will have enough to keep us from going hungry but there is very likely to be a shortage of certain essential foods unless something is done.

In Massachusetts something is being done. Already Governor Saltonstall has appointed a Home Garden Committee to work on this problem of food production. The job of the committee is to promote home vegetable gardens in every city, town, and community in Massachusetts. Last year we had in Massachusetts hundreds of Victory Gardens but this year we are going to have thousands of Victory Gardens if this committee has anything to say about it.

Now that's just where you come in. The food that you produce in your back yard garden may be the very food that will fill the empty spot in our national market basket. Tomatoes and beans and corn and beets and carrots and cabbage, and so on through the list - if these are produced in the home garden, they will supply the family with vegetables during the summer months and the extra vegetables produced at home can be canned for use during the winter months. Then your family will be able to laugh at any food shortage which might develop.

---G. O. Oleson

# Fruit Notes

ISS MILDRED HOWARD
XTENSION SERVICE
OUTH COLLEGE

April 24, 1943

Prepared by the Fruit Program Committee
3 42 of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## RADIO SPRAY SERVICE

Following is the schedule for the broadcasting of fruit pest control information to be released by the Extension Service in the departments of Botany, Entomology and Pomology. The message released Monday afternoon will be broadcast on Tuesday and repeated Wednesday, while the message released on Wednesday afternoon will be broadcast on Thursday and repeated on Friday. Whenever occasions justify, new messages will be telephoned or wired to the stations for Wednesdays and Fridays to replace the repeat-announcements.

In compiling each message, the Extension Service will have access to confidential weather information directly from the East Boston Airport Station of the U.S. Weather Bureau, for use only in agricultural operational advices.

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Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

1. WBZ, Boston and WBZA, Springfield; 1030
   (a) The 6:00-7:00 A.M. program: at 6:20 A.M. and again at 6:50 A.M.
   (b) The 1:10 P.M. program: at 1:10 P.M.

2. WNAC, Boston (and Yankee Network): at 6:25 A.M.

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|---|---|
| WNAC, Boston, Mass. | 1260 |
| WAAB, Worcester, Mass. | 1410 |
| WEAN, Providence, R.I. | 790 |
| WICC, Bridgeport, Conn. | 600 |
| WCSH, Portland, Maine | 970 |
| WLNH, Laconia, N. H. | 1340 |

3. WEEI, Boston, The "Farmers Almanac of the Air"; at 6:15 A.M. 590

4. WLAW, Lawrence, Mass.; at ? A.M. 680

5. WTAG, Worcester, Mass.; at 6:30 A.M. daily. 580

This annual radio spray service for fruit growers will begin April 26. The first message will be broadcast on April 27. Copies of the same messages will be mailed to county agricultural agents, to certain newspaper editors who have requested them, to fruit specialists of other New England states, and to a few cooperator growers who furnish the College at regular intervals with specific information pertaining to tree and pest developments.

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The 1943 APPLE SPRAY CHARTS have been distributed. If you failed to receive a copy contact your county agricultural agent or the State College.

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ONE REASON FOR POOR SHAPED TREES

An article under this heading appeared in the April, 1936 issue of Fruit Notes. We repeat what was said at that time, firmly believing that a good framework is of much importance and that young trees should be induced to make good growth from the start. "It is easy to maintain a good framework in a tree which is making strong annual growth. A vigorously growing grafted tree, for example, tends to grow a leader type of framework while a starved or stunted tree may, when stimulated, break out in some unexpected quarter. Even in an ordinary winter when other trees suffer little or none at all, there may be just enough injury to the Baldwin wood to make it less efficient in conducting water and other materials to the growing points of the previous season. As a result, water and mineral elements become shunted into other channels where the path of conduction from the roots is shorter. And after a season of good growth these sprouts continue to grow until they themselves are wide-tracked in favor of still younger growths."

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A thought for today: "Do What You Can of What You Know You Ought to Do."

# Do You Know:

That 275 carloads of apples were recently packed in 35 freight cars? The explanation is that the apples were dried. They were forced under pressure into No. 10 tin cans. Thirty two pounds of apples, dried until they weigh only 4 pounds, go into one of these cans. A total of 200,000 boxes or 275 carloads of fresh apples (7,680,000 lbs.) were transformed into just under a million pounds of dried apples which were packed tightly into 240,000 cans. This made 40,000 cases.

That a close approximation of the date at which a given variety of fruit will mature can be made at the time of full bloom? After a three-year study, M. A. Haller of the U.S.D.A. has concluded that the number of days from full bloom to maturity is a more reliable index of maturity than pressure test, ground color, seed color, or starch test. The average number of days between bloom and harvest for a few varieties are as follows: Oldenburg apple, 98; McIntosh, 127; Rhode Island Greening, 135; Montmorency cherry, 62; Bartlett pear, 121; Elberta peach, 128.

That there are approximately 4000 acres of cultivated blueberries in the U. S. with a crop value of nearly $1,000,000? The raspberry acreage amounts to about 59,000 acres with a crop value of more than $7,000,000. Blackberries and dewberries total nearly 35,000 acres with a crop value of $3,700,000.

That the total capacity for the manufacture of synthetic nitrogen in the United States after the war will be more than twice as great as this country's maximum annual pre-war consumption of nitrogen for all purposes? The amount of nitrogen which can be supplied to farmers from this expanded industry will greatly affect crop production after the war. The problem of utilizing this unprecedented tonnage of nitrogen is to be studied by a recently organized committee of which R. M. Salter, Chief of the U.S. Bureau of Plant Industry, is chairman.

That soils of Massachusetts are by nature predominantly acid? Many cultivated plants or crops grow poorly on an acid soil while certain others may fail utterly unless lime in some form is used to correct this condition. More than 50,000 tons of liming material are used annually to increase crop yields in Massachusetts. For full details concerning this subject, see Mass. State College Leaflet No. 134, "Liming Soils."

That organic matter performs at least four important functions in the soil? (1) It gives the soil a good structure and improves its tilth. (2) It provides food for bacteria. (3) It keeps plant food available so the plants can use them. (4) It serves as a storehouse of nitrogen, available phosphorus, potash and other plant foods.

That the State of Washington takes first place in the production of apples and second in pears? This state is also second in apricots and filberts, third in cherries, prunes and plums, fourth in grapes, and sixth in peaches.

That between 2 and 2½ million pounds of apple syrup will be produced commercially this year from the U. S. and Canadian apple crop, thus opening a new market for apple growers? The new syrup has much the same qualities as glycerine and is being extensively used in the manufacture of tobacco. This new material will free millions of pounds of glycerine for use in the manufacture of explosives.

That plastic, self-lubricated bearings are now in use in large, rotary fruit juice extractors? Faced with a shortage of bronze bearings, one machinery manufacturer found that a new type of "Lucite" bearing was actually lubricated by contact with citrus juices. The new bearings are equally resistant to orange, grapefruit and lemon juices.

That a record grapefruit crop of 46 million boxes is indicated for the present season compared with 40 million boxes last season and 42 million boxes the previous season? The quantity of Florida grapefruit handled by commercial processors to the end of February this year is more than twice as much as was handled up to that date last year. Texas also has a record grapefruit crop, 16 million boxes, which is 14% more than in 1942.

That a thin film of water-miscible wax applied to apples during the packing operation is now considered as a low cost method of prolonging storage and market life of the fruit? This means of reducing losses from shriveling is being studied at the Maryland Experiment Station, using Grimes Golden and Golden Delicious, both of which are very subject to shrivelling.

That red currants may not be as dangerous in the spread of white pine blister rust as is commonly supposed? Recent studies show that white pines become infected only rarely, even at short distances, from red currant bushes. The necessity of removing red currant bushes within 900 feet of which pines has not apparently been conclusively demonstrated.

That an unbelievable total of 27 million board feet of lumber may be saved by making a few simple adjustments in the thickness of apple box boards? According to a committee in the Northwest, these suggested changes will do the trick: Reduce the thickness of the ends from 25/32 inches to 11/16 inches; sides from 3/8 to 5/16, and tops and bottoms from 1/4 to 3/16 inches. It is claimed that the slight reduction in thickness of the sides alone would save 12 million board feet of lumber in a single year.

That a gigantic machine for shredding orchard brush is now in use in the Wenatchee district in Washington? This brush shredder, purchased by a group of 40 growers last year is capable of chewing brush at the rate of 6 acres per hour. The brush is first windrowed which enables the machine to scoop up everything in its path, leaving a trail of finely ground wood chips and splinters.

That only about 19% of the apple trees in the U.S. were of non-bearing age in 1940, compared with about 24% in 1930? Even though there were only about 1/3 as many apple trees in the United States in 1940 as in 1910, the production has not declined greatly owing in part to the gradual shift to better soils, higher yielding varieties, less caustic fungicides, and better all around orchard management.

That an average ton of farm manure contains about 10 pounds of nitrogen, 5 pounds of phosphoric acid, and 10 pounds of potash? The amount of manure produced annually per 1000 pounds of live weight is about 15 tons by cows, 12 tons by horses, 10 tons by sheep or fattening cattle, 18 tons by hogs, and 4.2 tons by chickens.

That the guano birds of Peru consume about 5½ million tons of fish annually, while the people of Peru consume only 4 thousand tons. The guano birds are considered to be among the most important in the world because of the enormous quantities of fertilizer for which they are responsible.

That ragweed has at least one advantage to offset its disadvantage as a spreader of hay fever? The ragweed borer has been found to be host to several parasites of the Oriental fruit moth, a serious pest of peaches. One experiment station has even recommended that ragweed be allowed to grow in peach orchards in order to favor the development of these parasites.

That apple scab, fungus disease Enemy No. 1 of apples, is known in all apple growing regions from the Atlantic to the Pacific? It is also found in British Columbia and in Southern Canada, in European countries, and in Australia, New Zealand and South Africa. The annual loss attributed to this disease in the northern part of the United States alone is estimated at $3,000,000 while for the entire United States the loss is approximately $40,000,000.

That the entrance of apple scab into a leaf or fruit is dependent to a large extent upon temperature? If the temperature is 43° the process takes about 15 hours, at 48° 11 hours, 59° 7 hours, 68° 4 to 5 hours, 75° 6 hours. Higher temperatures tend to retard or prevent growth. Leaves must remain wet about three times as long at 43° as at 68°.

That spray lime if exposed for a period of time to the air, loses its effectiveness as a corrective for arsenical burning? This is due to the fact that the essential ingredient, calcium oxide, is changed into the carbonate form, calcium carbonate, by the absorption of carbon dioxide from the air. In the carbonate form, the calcium is ineffective in preventing spray injury.

That 29% of the farm accidents in the United States have to do with machinery? 22% involve animals; 10%, excessive heat; 9%, falls of various kinds, 9%, vehicular traffic, 6% lightning, and 15% other causes.

That about 18,500 farmers in the U.S. lost their lives last year because of accidents? In addition, it is estimated that 100 times as many were injured. Hazards are even greater now because of new help. Greater care must therefore be exercised to avoid accidents, particularly with tractors and other farm equipment.

That the average farm garden in Michigan, amounting to 1/3 acre, produces enough food to rate as one of the best cash crops? On good land, properly managed and with rows spaced three feet apart, this average farm garden requires 92 hours of work. The resulting vegetables, according to a recent study, are worth nearly $200. The average farm gardener plants 18 different crops.

## BOX CEILINGS

In order to establish a price on New England apple boxes, the Office of Price Administration has issued recently Amendment No. 3 to Maximum Price Regulation No. 320, effective April 15, 1943. This establishes price ceilings on apple boxes, cranberry boxes and field crates in the six New England states. The original regulation did not include New England. The amendment places a ceiling of $21.50 per hundred on 1 1/8 bu. apple crates, in the shook, and a price of $24.50 per hundred nailed up including delivery within 50 miles of the sawmill. The price on cranberry boxes is $28.00 per hundred in the shook, and $31.00 nailed up.

## NEW STRAWBERRY VARIETIES

The following new strawberry varieties which are being named and introduced by the New Jersey Small Fruits Council this spring have been fruited two years at Amherst. Our observations are as follows:

Julymorn (N.J. 225). Very late, very dark red, large, objectionably furrowed, firm, very tart, good production. It is reported to be desirable for canning or freezing, but is not resistant to red stele.

Crimson Glow (N.J. 311). Mid season, dark, glossy, large, good quality, but not outstanding. Not resistant to red stele.

Sparkle (N.J. 312). Late, excellent quality, attractive red, firm, good production. Promising at Amherst. Reported to be very resistant to red stele.

---A. P. French

## PRODUCTION OF FRUITS IN NORTH AFRICA

We have recently obtained from Fred A. Motz, formerly foreign marketing specialist of the U.S.D.A., some figures concerning the production of fruits in a much publicized corner of the world, North Africa. The 1938 figures for Morocco are as follows: oranges, 1,547,000 trees; almonds, 4,604,000 trees; figs, 7,366,000; dates, 1,118,000; pomegranates, 585,000; and chestnuts, 204,000.

The average annual production of various fruits in Algeria between 1934 and 1938 were as follows: oranges, 1,522,000 boxes; mandarin oranges, 1,253,000 boxes; lemons, 102,000 boxes; figs (fresh consumption) 25,500 tons, (dried) 19,200 tons; dates, 114 tons; olive oil, 15,400 tons.

The 1930 statistics show 29,800 acres in orchards in Algeria with a total of 1,400,000 trees. Among the deciduous fruits were apples and pears, 4,400 acres; plums, 5,900 acres; peaches, 3,200 acres; cherries, 2,300 acres; apricots, 2,000 acres; almonds, 4,600 acres; medlars, 959 acres. To what extent these fruit plantings are being taken care of at the present time is a question. Under Axis domination the production undoubtedly dropped. It will be interesting to know to what extent the events of last November may have changed the agricultural picture in North Africa.

## RAIN - HAY - MICE - GIRDLED TREES

That's about the order of events which has resulted in some of the worst cases of mouse injury we've seen in years. In four orchards which have come to our attention growers are faced with a real job of bridge grafting. The reasons for so much mouse injury are not difficult to determine.

A heavy hay crop in 1942 plus many unharvested drops set the stage for an unusually heavy mouse population. Ideal "cover" provided not only protection against natural enemies but a good food supply in the form of tender grass. And so Microtus raised large families and many of them. With well established runs around the bases of apple trees the next step was to supplement the grass diet with generous samples of succulent inner bark. Another factor which worked to the advantage of the mice was this. At the time when mouse bait would normally have been distributed help was scarce and difficult to get. Many growers took a chance on mouse injury, -- and lost. There will probably be a renewed interest in the use of zinc phosphide bait next fall, thanks to a combination of circumstances which favored the furry Enemy No. 1 of the orchard underworld.

## HERE'S AN IDEA

At apple harvest time next fall apple growers who are fortunate enough to have a crop will undoubtedly be scouring the neighborhood for "scarcer than hens' teeth" apple pickers. Good apple boxes will be not only expensive but difficult to get. Available storage space must be used to good advantage. Considering all these things, why not make sure that at least 90% of the apples you grow this season are worthy of your efforts at harvest time, your packages and your storage? Grow only good stuff. Solve the low grade fruit problem by not growing low grade fruit.

Even in normal times apples below U.S. No. 1 grade are likely to be more of a liability than an asset. In wartime they become increasingly so. Walter R. Clarke of Ulster County, New York, writing in the Rural New Yorker, has this to say about apple grades and prices. "I believe it is true that the retail prices of apples are as high as we can expect for the nop notchers, Fancy and good No. 1's, but our trouble comes in the growing, handling and selling of that 30 or 40 per cent between cull and these top notchers. Carefully worked out figures show a loss of almost 20 cents per box on that percentage of our crops. This loss, taken from the gain made on the good 60 per cent, does not leave enough profit for the grower and his investment to keep him happy, growing apples."

## FRUIT PEST CONTROL IN GREAT BRITAIN

The ingenuity of the people of Great Britain is well illustrated in a group which has come to be known as Britain's "Golden Angels." The girls of Great Britain are doing work of every description during these wartime days that have taken men from their normal posts of work. Included are the multitude of tasks that must be done in the orchard. The girls are being trained thoroughly in the use of all apparatus and in the technical principles of spraying. Recently, a corps of spraying girls was formed in an endeavor to free orchards and fruit plantations from pests. One of the sprays generally used has the effect of turning the skin a bright golden yellow. As a result, the spraying girls have become known throughout Britain as the "Golden Angels." (Let's hope that the material they are using is not liquid lime sulfur.)

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J. H. Putnam, former county agent in Franklin County, says, "Right now there is only one thing we should all be thinking of: that is what we can do to help win this war. No sacrifice is too great - no surrender of ordinary rights too momentous - no privation too hard to bear. Why should we grumble about rationing of sugar, and oil, and gas, parity - subsidy, labor troubles, and heavy taxes, when our boys are offering their all - even their lives?"

## THE PLACE OF SMALL FRUITS IN THE HOME GARDEN PROGRAM

Home owners throughout Massachusetts are wondering whether or not fruits of various kinds should be included in the Victory Garden. To answer questions along this line, the Department of Pomology has prepared the following statement covering the various smallfruits.

Where space is limited and the garden is a wartime measure only, small fruits should not be grown in preference to vegetables. However, they make a welcome and valuable addition to the diet. Where space is available and the garden is to be continued for two or more years, some of the small fruits may well be included. No small fruit plant should be allowed to fruit the first season except "everbearing" strawberries, which are not generally satisfactory. Small fruits should not be planted in the middle of the vegetable garden.

Strawberries bring the quickest returns. Plants set this spring will bear a crop next spring. Fifty plants should supply a family of four. For best results new plants should be set each spring. Grapes usually bear the third year and continue for many years. Quicker returns may be had from renovation of old vines, since they are capable of producing a crop the next fall. Red Raspberries bear a small crop the second year and should come into full bearing the third year. Boysenberries are not recommended for general planting in this state but may succeed on lighter soils. Blueberries come into full production so slowly that they are not well adapted to the wartime garden.

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One definition of Entomology - "Gettin' right in among the bugs and watchin' 'em work."

# Fruit Notes

May 24, 1943

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## CURCULIO EMERGING FROM HIBERNATION

As this issue of Fruit Notes is being prepared, the following message comes from W. D. Whitcomb of Waltham: "Fifteen (15) curculio beetles were jarred from the trees Friday morning, May 21. This is the first collection this year and represents about 2% of the expected total number. If warmer weather occurs in the next few days, the calyx spray with lead arsenate will be very helpful in controlling this pest. Curculio collections will be made Monday, Wednesday, and Friday mornings for about one month. Cankerworms are quite abundant in some places and are beginning heavy feeding on unsprayed apple and shade trees."

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

## APPLE SCAB SITUATION

Whatever we may say about the present season, this much at least is true. It's different. From the apple grower's standpoint, the season is characterized by late bud development, early scab development, and day after day of wrong kind of weather for spraying. Below normal temperatures in April delayed fruit buds to an almost unprecedented degree. Bud development has been lagging approximately two weeks behind 1942. This spring when McIntosh buds had reached the Delayed Dormant stage we were reminded that on the same date in 1942 the buds were in the Pink stage. Fruit buds, being very sensitive to temperature, refuse to open up until the weather is reasonably warm.

While the apple buds were biding their time, the apple scab in the old leaves on the ground was steadily developing. At the Pre-Pink stage of bud development there were about as many mature spores in the old leaves as we normally find at blossoming time. We may safely say that a larger percentage of scab spores were either mature or already released by the time the blossoms were ready to open than has been the case in all the years we've been fighting scab in Massachusetts. Careful studies of old leaves from various sections of the state, made by O. C. Boyd on May 19, revealed the interesting fact that a mere 10 to 20% of the scab spores still remained in the old leaves. This represents an unusual spore discharge - not from the standpoint of the calendar, but of bud development.

Spray Message for Massachusetts Fruit Growers (No. 8), issued May 19, carried this timely suggestion: "If apple trees came into bloom before the Pink spray could be completed, it is advisable to finish that spray with sulfur alone. Apple varieties subject to scab and cedar rust need protection throughout the blossom period, particularly if wet weather threatens. Either a sulfur dust or a wettable sulfur spray may be used, but lead arsenate should be omitted. The protection from the Pink spray can be expected to last only five or six days at most. Where apple scab infection occurred on May 10 to 12, the new scab spots should begin to show up around May 24."

Apple leaves were not held back by cool weather to the same extent as apple buds. As a result, there is more leaf area in evidence on McIntosh spurs at blossoming time than in a normal season. Baldwin trees, on the other hand, always show a considerable leaf area at blossoming time. This year there is much less difference in the leaf area on McIntosh and Baldwin spurs. Following is a summary of the scab situation in Amherst, prepared by O. C. Boyd.

| Date | Length of wetting period (hrs.) | Fruit Bud Stage | Minimum time for Scab infection at prevailing temp. | Date when scab spots may be expected to appear on leaves |
|---|---|---|---|---|
| 5/3 | 18 hrs. | Late Del. Dorm. | 22 hrs. | - - |
| 5/8 | 14 hrs. | Early Pre-Pink | 15 hrs. | ? (May 21-22) |
| 5/10-12 | 60 hrs. intermittent<br>45 hrs. continuous | Late Pre-Pink | 15 hrs. | May 24-26 |
| 5/18-19 | 24 hrs. | Early bloom | 8-10 hrs. | May 31-June 2 |
| 5/19-20 | 10 hrs. | Early bloom | 12 hrs. | ? (June 1-3) |
| 5/21 | ? | Full bloom | 12 hrs. | ? (June 3-4) |

# Do You Know:

That only about 20,000 of the 625,000 known species of insects in the world, damage crops and other property, or spread disease? Of the 80,000 U. S. species, only 600, or less than 1 in 100, are considered destructive.

That the overwintering spores of Black Rot of Grapes are sufficiently mature to cause infection by the time the new shoots are 2 to 4 inches long? Fruit infection which occurs several weeks later is the result of summer spores which come from the early infection on the new growth.

That every fruit plant of a given variety in existence, whether Howard 17 strawberry or McIntosh apple, is a direct vegetative descendant of the original seedling? One Baldwin tree in Massachusetts is said to be of the third generation. In other words, it was grafted from a tree which was grafted from the original Baldwin. The latter is listed as a casualty in the hurricane of 1815.

That the waste in paring, coring and trimming apples for commercial canning of sauce amounts to more than twice as much in the $2\frac{1}{4}$" size as in the 3" and up? The losses per 100 lbs. amount to about 43 and 18 lbs. respectively. Numbers of apples per 100 lbs. are about 665 and 268. Losses in the $2\frac{1}{2}$" and 2 3/4" sizes amount to 30 x 23 lbs. respectively.

That more than 9,000,000 tons of commercial fertilizers were used in the U. S. in 1941? Of all the states, North Carolina used the largest amount - more than 1,000,000 tons. Of the total tonnage used in the country, federal agencies (AAA & TVA) distributed about 800,000 tons.

That the total cash income of American farmers in 1941 amounted to $11,830,000,000? This is the largest income received since 1920 when it totalled $12,608,000,000. The increase in 1941 over 1940 was $2,700,000,000.

That the stone walls in Massachusetts, if placed end to end, would be long enough to circle the globe at least 5 times, or reach more than half way to the moon?

That several fruit bulletins from Massachusetts State College have recently been revised? Among them are: "Peach Growing in Massachusetts," "Grape Growing in Massachusetts," and "Top Grafting Fruit Trees." Another revised bulletin, "Spraying and Dusting Fruit Trees," will be off the press soon.

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EVERY FOREST FIRE IS AN AXIS FIRE. Lt. Gen. H. A. Drum says, "Forest fires destroy a priceless source of raw material and also serve the enemy by endangering vital installations."

APPLE BLOSSOMS (A Borrowed Editorial)

Seeing an apple tree in bloom makes it easier to understand Johnny Appleseed's passion for planting orchards in the wilderness. A well-ordered orchard is a magnificent sight at this time of year, but even more breath taking must have been the beauty of the trees the old wanderer planted all up and down the Ohio Country when most of it was still Indian Land. Primitive Christian that he was, old Johnny must have exclaimed many times at the beauty of God's works and the bounty of His benevolent hand.

Those who walk the hills today get the same feeling when they come upon an orchard abandoned to meadow grass and gone wild. The old trees, gnarled with struggle and untrimmed for years, lift their blossom-laden branches as offering to the sun, and all around them stand the young wildlings, sprung from seed and surviving only by their own strength and hardihood. The air is sweet with their fragrance and loud with their company of bees. Every stage of beauty lines the branches, from the flush of the bud to the wide-petaled whiteness of full bloom.

The abandoned apple tree and its seedlings belong with the wild rose and the blackberry tangle; with the rose in particular, which the botanist meticulously points out is its cousin once or twice removed. And it is the particular possession of May, when Spring is no longer in doubt and Summer has not yet really turned on the heat. It belongs with warm rain and the first buttercups and scarlet tanagers telling the morning what a lovely thing it is to be alive.

Johnny Appleseed knew what he was about.

PRICE CEILINGS FOR APPLES

A committee representing the apple growers of the northeastern states, including John Chandler and John Lyman, has prepared the following statement for the OPA after considering all angles of the apple industry:

The Northeast has become the arsenal of the United States. Industry has expanded beyond the most optimistic estimates. Agriculture in the Northeast is not extensive in the light of the over-all picture, but agriculture is definitely rising to the emergency with greater than anticipated production under handicaps of shortages of labor, machinery, materials, etc. The apple growers of the Northeast produced and harvested one of the largest crops on record in 1942 and marketed it in a very orderly manner at fair prices to the consumer. Indications in the orchards this spring point to a crop of apples which will probably be smaller than that in 1942, but may not be smaller than an average crop for the five years prior to 1942. Thus, we should not expect a real shortage of apples - neither should be expect a run-away market.

The apple growers of the Northeast feel that we have a definite part to play in the production of food for the successful conduct of the war. We are anxious to grow, harvest and market a crop of the best apples

possible and, given the proper market support, it will be done. Any move to establish ceiling prices which will weaken this support will have a definite destructive effect on the production of apples.

Following a meeting of the National Apple Planning Committee and a meeting of the apple growers of the Northeast, at which price ceilings were discussed, it was concluded that ceiling prices on apples would be impractical and have a tendency to discourage the greatest production of apples.

Apples are highly perishable, subject to the vagaries of weather, deterioration and many other factors beyond the control of growers. Arbitrary controls introduced into such situations do not provide for sufficiently flexible adjustments for these rapidly changing conditions.

However, if our Government is committed to ceiling prices on all commodities, to control inflation and protect the consumer from run-away prices, the apple growers stand ready to cooperate with it.

To make the plan simple and easily understood by the consumer and easily enforced, we suggest that should there be such a price ceiling, it be a price ceiling to the consumer with no other control along the line. This price should be set high enough to encourage the largest production of the best grade of the most desirable variety grown in the most remote areas of production.

We feel that should such a ceiling be established with an average crop of apples well distributed in all producing areas, as was predicted by the National Apple Planning Committee, it would provide a chance for the law of supply and demand to work as nearly normally as possible.

IN CONCLUSION: 1. We do not believe arbitrary price controls are for the best interests of the producers or the consumers in that they discourage production and hamper distribution.

2. If a ceiling is to be applied, it should be applied only on the retail price.

3. The Apple Industry is highly competitive, both within itself and with other fruits. If a price ceiling is applied, we suggest it be applied at a level that will interfere as little as possible with the normal law of supply and demand.

## FARM LABOR PROBLEM BEING SOLVED

With emergency farm labor assistants appointed for all counties and with state and federal agencies coordinating their efforts, Massachusetts is rapidly developing a program which should effectively handle the farm labor problem.

The program developed by the Massachusetts Farm Labor Committee is right in line with the federal farm labor plan which went into effect

May 1. Hence the program already started will continue under the supervision of the Massachusetts State College Extension Service at Amherst. In close cooperation will be the Massachusetts Farm Labor Committee appointed several months ago by Governor Saltonstall, the high schools, the U.S. Employment Service, and other interested groups.

In dealing with the farm labor problem first attention should be given to the full utilization of all labor resources within the community. Where there is not enough labor available locally the farm labor assistants will attempt to recruit workers from nearby communities. The need of year-round workers on farms presents a much more difficult problem. There is no supply of year-round workers. Consequently close cooperation with local selective service boards is needed to keep present necessary year-round workers on productive or essential farms.

The county agricultural agents have full responsibility for the recruitment and placement of farm workers in their respective counties. They will be assisted by these newly appointed emergency farm labor assistants. These men will do everything in their power, but it will be necessary for any farmer who has a farm labor problem to take that problem to the county agricultural agent's office. For Suffolk County the emergency farm labor assistant is John B. Casey, head master of the Jamaica Plain High School.

In close cooperation with the farm labor program will be the woman's land army and the 4-H farm labor project.

--Roy E. Moser
State Supervisor
of Emergency Farm Labor

LIST OF EMERGENCY FARM LABOR ASSISTANTS IN MASS.

| County | Name and Address | Office Telephone |
|---|---|---|
| Barnstable | **Dr. Edmund deS. Brunner, Emergency Farm Labor Assistant**<br>Cape Cod Extension Service<br>Barnstable, Mass. | Barnstable 86 |
| Berkshire | Wells Conklin, Emergency Farm Labor Assistant<br>Berkshire County Extension Service<br>Federal Building<br>Pittsfield, Mass. | Pittsfield 8285 |
| Bristol | Carl L. Erickson, Emergency Farm Labor Assistant<br>Bristol County Agricultural School<br>Segreganset, Mass. | Dighton 3611 |
| Essex | Wm. P. Scott, Emergency Farm Labor Assistant<br>Essex County Agricultural School<br>Hathorne, Mass. | Danvers 50 |

| County | Name and Address | Office Telephone |
|---|---|---|
| Franklin | George C. Hubbard, Emergency Farm Labor Assistant<br>Franklin County Extension Service<br>Court House<br>Greenfield, Mass. | Greenfield 9698 |
| Hampden | George W. Harris, Emergency Farm Labor Assistant<br>Hampden County Improvement League<br>1499 Memorial Ave.<br>West Springfield, Mass. | Springfield 6-7204 |
| Hampshire | Wm. R. Kershlis, Emergency Farm Labor Assistant<br>Hampshire County Extension Service<br>15 Gothic Street<br>Northampton, Mass. | Northampton 2556 |
| Middlesex | Wm. H. Slayton, Emergency Farm Labor Assistant<br>Middlesex County Extension Service<br>19 Everett Street<br>Concord, Mass. | Concord 845 |
| Norfolk | Hilmer S. Nelson, Emergency Farm Labor Assistant<br>Norfolk County Agricultural School<br>Walpole, Mass. | Walpole 268 |
| Plymouth | Frank T. White, Emergency Farm Labor Assistant<br>Plymouth County Extension Service<br>Court House<br>Brockton, Mass. | Brockton 4993 |
| Suffolk | John B. Casey, Emergency Farm Labor Assistant<br>Headmaster, Jamaica Plain High School<br>Jamaica Plain, Mass. | Arnold 4074 |
| Worcester | John A. Gatti, Emergency Farm Labor Assistant<br>Worcester County Extension Service<br>Federal Building<br>Worcester, Mass. | Worcester 3-5477 |

## NEW METHOD OF PRESERVING FRUITS

The British made a request when we began to ship them fruits under the Lend-Lease program. Would we please just preserve them in sulphur dioxide solution, and ship them over in wooden casks? That was a big surprise for our food men. Wouldn't the British prefer fruits canned in bright tin containers? No, the British really wouldn't. Well, the British were eating the fruit, so let them have it the way they wanted it. And the sulphur dioxide method is saving tin.

So the big American canners turned out the British fruit orders the

way they wanted it: 250,000 barrels have gone to them in this sulphur dioxide solution during the past three years. The sulphur dioxide method is simple. Take strawberries, for example. The berries roll straight from the field to the freight loading platform, alongside the railroad tracks. They're washed, hulled, and dumped into wooden barrels with a 2% sulphur dioxide solution. The barrel is sealed, put on the freight car, and it's on the way to England. The whole thing takes half an hour. Millions of pounds of these sulphited strawberries are being shipped to England this season.

The preservation of peaches takes a little longer because they have to be peeled and pitted. Last year we shipped, in this manner, citrus pulp, peaches, strawberries, raspberries, and dewberries. This year we'll probably add cherries. Fruits preserved in sulphur dioxide are used for preserves, jams, ice cream, and pies.

These sulphited foods, such as strawberries, have to go through a special step when they're taken out of the wooden casks to start on their way to jams and pies. They must be boiled vigorously for 45 minutes. That drives off the sulphur dioxide in the steam. And with it, the bitter sulphur taste. Oddly, the sulphur dioxide solution takes most of the color out of fruits. But when they boil for 45 minutes, the color comes back. And that's important, because who wants to eat pale yellow strawberry jam?

## WINTER KILLING OF RASPBERRIES

The following table gives an estimate of the amount of winter killing in a planting of young raspberries set at the State College in the spring of 1942. To get a better measure of the true cold resistance of the varieties, canes which were on the ground and therefore protected by snow were ignored in making the estimate. On all varieties it was very noticeable that big, vigorous, branching canes were injured worse than smaller, less vigorous canes.

| Red Varieties | % Injury | Red Varieties | % Injury |
|---|---|---|---|
| Sunrise | 0 | Cuthbert | 25 |
| Tahoma | 5 | Taylor | 28* |
| Indian Summer | 5 | Washington | 30* |
| Latham | 9* | Ohta | 35 |
| Ranere | 10 | Milton | 44* |
| Chief | 11* | Viking | 45 |
| Lloyd George | 15 | Marcy | 68* |
| Cayuga | 20 | Newburgh | 75 |

| Purple Varieties | % Injury |
|---|---|
| Ruddy | 5 |
| Columbian | 50 |
| Marion | 75 |
| Sodus | 90 |

*Figures starred are averages of several plots; others are based on one plot.

--J. S. Bailey

## CONTROLLED ATMOSPHERE STORAGE

The controlled atmosphere or so-called "gas" storage room at M.S.C. was opened April 30 just a little over seven months after it was sealed up on September 25, 1942. The McIntosh apples from this room which was held at 40° F. were more firm, crisp and juicy and definitely higher in eating quality than similar apples held at 32° in a common cold storage room. This was due to the fact that in the controlled atmosphere storage where the oxygen supply was drastically reduced and the carbon dioxide was maintained at a relatively high level, the apples "lived" at a comparatively slow rate even at the 40° F. temperature. As previously described, apples use up oxygen and give off carbon dioxide. In the tight room, this process contined until the oxygen level was down to 2% or at times slightly lower. The carbon dioxide increased, of course, but was not allowed to get above 10% because of possible toxic effects. This was accomplished by periodically removing this gas by passing the atmosphere of the room through a special "washer." The contents of oxygen and carbon dioxide were measured every other day or so to determine when "washing" or ventilation were required to maintain the artificial atmosphere.

One trouble not encountered heretofore was a soft scald type of injury which may have been due to an insufficiency of oxygen during the intervals when the oxygen level was below 2%. This experience indicates the special care that must be exercised in operating a storage of this kind. However, the peculiar difficulties encountered with this type of storage are far from insurmountable as proven by the successful operation of several controlled atmosphere storages in New York State. It is reported that McIntosh out of these storages this spring brought from one to two dollars a bushel above the wholesale market price of regular cold storage McIntosh. Perhaps, with the return of peacetime conditions, controlled atmosphere storage may find a place in Massachusetts, at least on a limited scale.

--Lawrence Southwick
--O. C. Roberts

## THE FUNGICIDE AND INSECTICIDE SITUATION

The following information is based upon recent reports chiefly from the Agricultural Insecticide and Fungicide Association, the Agricultural Chemicals Section of the Office of Price Administration, and the Chemicals Division of the Food Production Administration.

Lead Arsenate: The production for 1943, which will be 10% less than in 1942 but 10% greater than in 1941, is to be completed by June 30. A restrictive order precludes its use on shade trees, ornamentals, lawns and golf greens at least until after sufficient supplies are assured to protect essential crops. The supply available for food and fiber crops is expected to equal that used for the corresponding crops in 1942.

Calcium Arsenate: The present schedule calls for a substantial increase over the supply in 1942. Sixty per cent of the total production will be completed by June 30 compared with 40 per cent at that date last year.

Copper Fungicides: Until recently, the 1943 schedule indicated 80,000,000 lbs. of copper sulfate for agriculture, the same amount allocated for that purpose in 1942. The Office of Food Production Administration recently announced that this figure would likely be increased to 100,000,000 pounds, in view of the increased acreage of potatoes and vegetables throughout the country. That office estimates that 75,000,000 pounds will be needed to protect potatoes, tomatoes and fruits. It also cautions that "..... although the supply of copper compounds will be the largest in history, every effort must be made to conserve supplies."

Rotenone: The nation's supply is drastically limited and strictly allocated. The country used in 1941 about 8,500,000 pounds of roots, and in 1942 about 6,500,000 pounds. The Food Production Administration estimates that "this year.....close to 3,000,000 pounds will be available to meet the requirements of the crops and uses as set forth in amended Conservation Order M-133 " This limitation order restricts the use of rotenone on crops to peas for weevil and aphids; to beans for the Mexican bean beetle; to sweet corn for the European corn borer; and to cole crops other than cabbage (that is, to broccoli, cauliflower, brussels sprouts, kale, etc.) for caterpillars and aphids. Rotenone dusts manufactured in 1943 may contain not more than 0.5 per cent rotenone, and they may not contain any pyrethrum. Derris and Cube powders may not contain more than 4 per cent rotenone. Regarding the dilutions for Derris and Cube preparations in spray form, the amended Conservation Order M-133 "permits the use of 4 per cent rotenone spray powder in accordance with common practice."

Pyrethrum: Although supplies are substantial, their use in agriculture is drastically limited because of military needs. A limitation order now in preparation, it is reported, permits the use of pyrethrum on all Cole crops (cabbage family); on vegetables in the home, farm and community gardens; on beet-seed crops; on corn, beans and potatoes; and on grapes and cranberries.

Cryolite: Supplies for 1943 are much greater than ever before -- 15,000,000 pounds as compared with 6,000,000 pounds in 1942. Cryolite may be used in place of arsenicals on shade trees and ornamentals, and as a possible substitute for lead arsenate on apples and pears. It is also being recommended for the control of chewing insects on various vegetable crops.

Nicotine Sulfate: Provision by U.S.D.A. for the production in 1941-43 of about 1,800,000 pounds through a tobacco diversion program, in addition to the quantity ordinarily obtained from tobacco wastes, insures an ample supply for insecticidal purposes. A production of about 3,000,000 pounds is estimated for 1943.

Calcium Caseinate: Domestic production is now low because of milk problems. The situation, however, is expected to improve with the advance of the season.

These are Adequate: Cyanides, Fish Oils, Hormone Sprays, Spray Oils, Paradichlorobenzene, Borax, Spreaders and Stickers, Zinc Oxide, and Zinc Sulfate.

--O. C. Boyd and A. I. Bourne

# Fruit Notes

June 18, 1943

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



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## FRUIT PROSPECTS

Early estimates of the 1943 apple crop indicate at least 10 million bushels less than in 1942. The peach crop will be about 20 million bushels less. This 30-million-bushel shortage is only about 5% of the Nation's fruit crop. The 19 major fruits, grown in this country, grossed in 1942 the respectable total of 15,107,259 tons.

At a fruit meeting at the Chandler farm in Sterling, June 11, attended by more than 150 growers, the following estimates of the 1943 crop, in comparison with 1943, were obtained. The total represents about 25% of the commercial crop in Massachusetts.

| | 1943 | 1942 | % increase or decrease |
|---|---|---|---|
| McIntosh | 461,000 bu. | 500,000 bu. | -7% |
| Baldwin | 67,000 bu. | 115,000 bu. | -40% |
| Delicious | 33,000 bu. | 26,000 bu. | +27% |
| Other varieties | 78,000 bu. | 93,000 bu. | -16% |
| Total | | | -12% |

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Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

## THE WOMEN'S LAND ARMY

As part of the United States Crop Corps, the Women's Land Army has been organized nation-wide, to help with the gigantic task of producing enough food for our boys in service, our allies, and civilians.

The idea of women working on farms is not new. Throughout history they have done many tasks. And so it is today - women are already working, and still more - are willing to work on farms in Massachusetts.

Members of the Women's Land Army must be at least 18 years of age and must secure from their local doctor a certificate stating they are in good physical condition for hard farm work. Women may enroll as either full-time or part-time farm workers but must agree to work at least one month. It is not necessary to have had farm experience. In fact, many farmers prefer training their own help for specific farm work.

To hold the patriotic place with WAACS, WAVES, Marines, and SPARS, members of the Women's Land Army are eligible to wear the uniform designed for farm labor. It consists of a dark blue coverall, a light blue shirt, a hat of two shades of blue, and a dark blue jacket.

On a fruit farm there are many jobs that women have done and can do, such as: help with the spraying and pruning, picking, grading and packing of fruit, and driving the truck to market. In some cases, it might be more efficient, if the members of the Woman's Land Army took over some of the responsibilities in the home, and so relieve the farm homemaker to work outside on the farm.

Arrangements may be made by one or two neighboring farmers who might have need for part-time employment of a woman to help on their farms. Together they could keep her employed full-time. In other cases, a group of 6 or 8 women might be housed in the village center, and several farmers arrange for the transportation of workers to their farms nearby.

Your County Agricultural Agent or Emergency Farm Labor Assistant located at the County Extension Office are able to help you in locating members of the Women's Land Army to work on your farm.

--Beatrice E. Billings

## CURCULIO ON NON-BEARING TREES

Having jarred five curculio beetles from a small peach tree a few days ago at the Derby farm in Leominster, we were interested in knowing if this insect is commonly found on trees without a crop of fruit. So we put the question up to W. D. Whitcomb of Waltham. He answered as follows: "The collection of curculio beetles on peach trees without fruit is not unusual. In the early part of the active season there is considerable migration during which the beetles apparently are searching for fruit for oviposition. Curculio beetles definitely feed on blossom petals but I have no record of feeding on foliage. It is quite possible, however, that they feed slightly on the leaf petiole and possibly on tender shoots."

# Do You Know:

That grapes are produced commercially in 44 states and on a farm-home scale in every state in the Union? For the 16 years preceding 1939 the average annual farm value of grapes in the United States amounted to about $49,000,000. California leads all other states in gross tonnage, with about 90 per cent of the total, while New York, Michigan, Ohio, and Pennsylvania are the heaviest producing states in the eastern and central parts of the country.

That 150,000 pressure canners are being manufactured for this year's canning season? On request of the Department of Agriculture, WPB is allocating enough material for this much needed equipment. These canners will be distributed under a rationing system through County USDA War Boards.

That the early June price of strawberries on the Boston market this season is about twice that of 1942? The quotations for last year ranged from 17 to 20 cents. This year the price was about 37 cents.

That blueberries tend to keep their Vitamin C content longer than other berries thus far tested? Being thicker skinned they injure less easily and as a result the oxygen of the air which is destructive to the vital ascorbic acid is less likely to reach the cells beneath the skin.

That ammonium sulfamate is very effective in killing chokecherries? J. S. Bailey and L. Southwick used this material at several concentrations and found that the speed of killing was proportional to the concentration.

That the use of peat in planting apple trees is under some growing conditions of very doubtful value? In an experiment at M.S.C. started in 1939 there is no significant difference between the check and untreated trees at the present time.

That codling moth and Oriental fruit moth spend the winter as fully grown larvae in silken cocoons ? The bud moth spends the winter as a partly grown larva while the gypsy moth spends the winter in the egg stage.

That frozen food lockers, which were practically unknown during the first World War, now occupy an important place in our food preservation system. Approximately 3,200 plants, serving more than a half million families, almost three-fourths of them farmers, were operating in 44 states on January 1, 1941.

That 5 bushel baskets contain enough lumber to box 1500 rounds machine gun ammunition? Save containers. Use them again. Men, machines and materials once used to make food containers are now doing war work.

## STORAGE TEST OF CARDBOARD AND FIBER APPLE BOXES (1943)

Tests of a number of the newer apple boxes have been under way at the State College during the past winter and spring. The purpose of this test was to gain an idea of the way in which common types of cardboard and fiber boxes would hold their shapes in storage and to what extent they would continue for several months to carry the weight of a stack without throwing such pressure on the fruit as to ruin it.

About 50 boxes were involved in the test. Most of the leading manufacturers in the Northeast were represented, some with several boxes.

The test was set up in duplicate: one set of boxes was placed in a storage room run at about 40° F. with relative humidity at about 90 per cent. The other was placed in a room run at about 35° F. with humidity at 85 per cent.

Each box was placed on an inverted wooden box to keep it off the floor and it supported a weight equivalent to a stack of filled boxes. The heights of the stacks ranged from two to ten boxes.

The boxes were placed in the stacks at intervals from the first of February to the first of March as they arrived, and the test ended June 1. Observations and careful measurements of bulging and settling were made at frequent intervals.

All boxes, including those with wood-frame ends, showed some bulging of the sides and ends which increased with time. On the sides this varied from 0.2 inch to 1.9 inches. In general, the boxes with no wooden supports settled most, and as might be expected the settling was most rapid. Even the "waterproof" fiber boxes bulged and settled after several weeks under humid conditions. Five cardboard boxes failed to hold up to the end of the test and toppled over. Each was under a stack of six to eight boxes. Where placed under three or four boxes, they stood up better.

### Tentative Conclusions

1. Water-resistant fiber holds up longer than cardboard but the difference after two or three months is much less than was expected. All such material softens in storage.

2. Boxes with glued tops and bottoms and smooth all around are not only inconvenient to close but difficult to lift and handle. They are much more likely to be dropped or thrown than others, although they need not be handled roughly.

3. Hand holes provide for easier handling but open the way to serious bruising and lacerations by fingers and fingernails with fruit as soft as McIntosh is likely to be in late winter. Snap-on covers or panel ends facilitate handling.

4. Apples were in poorest condition in air-tight boxes. Ventilation should be provided if apples are to be stored for several months.

5. Boxes with wood-frame ends and side rails stood up best under normal stacking in storage. Diagonal pieces placed inside the box helped a great deal. Side rails of fiber bulged more than wooden ones.

6. Where wood is used for support, vertical pieces should be cut full length or there will be compression and slumping as in other boxes.

7. None of the boxes was as satisfactory as a wooden box for storage purposes, although almost any of them could be used with careful provision to offset their weaknesses. They cannot be handled like wooden boxes. No all-cardboard or all-fiber box should be stacked more than three or four high without a staging of some kind to carry an increased load. They must be ventilated if they are to stay in storage long. Ventilation is probably somewhat less important at 32° F. than at a higher temperature. Also, boxes are likely to soften and settle faster at higher temperatures. (Report prepared June 3, 1943).

--L. Southwick and A. C. Ballard

## DO BEES INJURE RIPE FRUIT?

A recent letter was received relating to the injury of fruit by bees. The inquirer stated that last year she lost bushels of grapes due to the bees piercing the fruits and then leaving them to decay.

In 1886, McLain demonstrated that honeybees are incapable of injuring sound fruit. He placed a colony of starving bees in a cheesecloth tent. In the same tent a considerable quantity of ripe grapes were placed. The bees starved to death and did not injure the grapes, thus demonstrating their lack of ability to puncture the fruits from which they could have obtained food.

Honeybees will visit grapes, plums, and other sweet fruits after these have been injured by some other agency. Birds and yellow jackets are capable of injuring fruit. Honeybees cannot penetrate the skin of a grape or a plum due to the structure of their mandibles.

--F. R. Shaw

## COMPETITION BETWEEN GRASS AND FRUIT TREES

It is rare for the trees in a newly planted orchard in grass sod to make good growth. They cannot compete successfully with grass for moisture and fertilizer nutrients. Fredd R. Trask of Sterling has a young orchard of one-year whips, mostly McIntosh set in the spring of 1942, that has made good growth in grass sod. The increase in trunk diameter during the fruit season was from 0 to 14 millimeters, the majority increasing 6 to 11 millimeters. Most newly planted trees increase about 3 to 6 millimeters. The soil in the Trask orchard is rather moist for fruit trees. It was formerly used for truck crops and therefore must have been well fertilized. If young trees are to compete with grass, there must be an ample supply of water and plant nutrients. Under most conditions, young trees should be cultivated or mulched.

--J. K. Shaw

THE PACKED LUNCH FOR THE FARMER'S HELPER

Boys and girls who work hard in the fields and barns all day need good nourishing food. If they are to get each day the foods necessary for good health and energy, the noon meal must provide one-third of the day's requirements. Each lunch should contain: (1) Milk. (2) Meat or a meat alternate such as cheese, eggs, fish, dried beans or peanut butter. (3) Vegetables and Fruits - one serving of vegetable and one of fruit, or two servings of vegetable. (4) Whole wheat or enriched bread, with butter or fortified margarine. (5) Something sweet.

Milk may be taken as a drink or used in cocoa or milk soup, if a thermos bottle is available.

The Meat or Meat Alternate is usually most conveniently put into a sandwich; the devilled egg, slices of meat or meat loaf, cheese, or a piece of chicken may be wrapped in waxed paper and carried that way.

Vegetables and Fruits (one should be raw). Suggested are: Vegetable sticks - carrot, turnip, green pepper, or cucumber. Shredded or chopped in sandwiches. Tomato or celery whole, and leaves of lettuce wrapped in waxed paper. Cooked carried in a jar - tomatoes, green beans, peas, asparagus. A piece of fresh fruit - any kind available: prunes and apricots stewed; a handful of raisins or a few figs uncooked; stewed fruits of all kinds; jellied fruits - use juice to replace part of water.

Bread may be bakery or homemade. It may be varied with raisins, prunes, peanut butter or other additions. At least half the bread should be from whole grain and all white bread should be enriched.

Simple desserts are best and must necessarily be used now, with sugar and fat rationed. In addition to fruits mentioned above, some suggestions are: custard, simple puddings (bread, tapioca, fruit); fruit and spice cake; gingerbread; simple cookies. Frosted cakes and pies will not often be available, which is just as well.

Sandwiches must provide the basis of most packed lunches. Have variety - dark as well as white, hearty as well as sweet. Keep the bread thin and the filling thick and moist. Some suggestions for fillings are:

1. Vegetables. Uncooked - tomato (sliced), carrot (ground or grated), spinach (shredded or chopped), cabbage (shredded), lettuce, parsley, watercress, and green peppers, with or without dressing.

2. Dried fruit - grind together 1/2 cup raw raisins, 1/2 cup raw apricots, 1 cup cooked prunes, 1/2 cup prune juice and 1 tablespoon lemon juice, and let stand over night. This will keep for a week in a cool place.

3. Apple - grind raw apple in skin and mix with equal parts of cooked, dried prunes and raw raisins ground.

4. Meat (sliced, chopped or ground) with or without dressing. A little chopped pickle or green pepper may be added to the dressing.

5. Fish, fresh or canned, mashed and mixed with salad dressing. Use with lettuce, cucumber sliced or chopped, chopped cabbage or spinach.

6. Liver spread - 1 cup ground cooked liver, moistened with salad dressing. To this may be added 2 teaspoons grated onion, 2 teaspoons finely cut chives, 2 tablespoons minced parsley, or 1 tablespoon chopped pickle.

7. Egg, hard-cooked or scrambled, with salad dressing. Chopped celery, lettuce, spinach, cabbage, or crisp chopped bacon may be added.

8. Cheese. (a) American - grate and mix with salad dressing. (b) Cottage or cream - with chopped dried fruit, nuts, olives, marmalade, jam, jelly, preserved ginger, or grated raw apple.

9. Peanut butter (softened with salad oil, milk, cream, or salad dressing) with grated carrot, chopped raisins or prunes, or sliced raw apple.

10. Parsley or chive butter. Cream butter or reinforced margarine, add equal parts finely chopped parsley or chives.

11. If bread is well flavored or moist, a very delicious sandwich is made with only butter or reinforced margarine. This is particularly true of some of the quick breads to which fruit and nuts have been added.

--May E. Foley

## ADDITIONAL NITROGEN RELEASED TO INCREASE 1943 CROP YIELDS

Additional nitrogen fertilizer has been released by WPB on 1943 crops. The fertilizer is of two kinds: (1) A very limited quantity of nitrate of soda (15 per cent nitrogen); (2) a relatively large supply of ammonium nitrate (30 per cent nitrogen). There is no restriction on the use of this supply.

This will be sold by fertilizer dealers direct to farmers. Farmers who can use this fertilizer should place their orders immediately with their usual fertilizer dealer so that orders may be assembled in carload lots for quick distribution.

Dealers' margins on this material will be very small, and little expense can be incurred by the dealer in canvassing farmers for their needs. The material must be moved as rapidly as possible and it is hoped that it can all be distributed in the month of June.

It may be used to advantage on vegetable and forage crops and pastures. Hay lands from which the first crop is removed may be treated immediately with 100 to 200 pounds of ammonium nitrate to increase the second crop. On pastures it should increase the production of late season grasses.

Ralph W. Donaldson of the Massachusetts State College sees in this supply of fertilizer an opportunity for farmers in Massachusetts to substantially increase their yields of hay and pasture forage.

If you know of farmers in your town who can use nitrogen fertilizer to advantage, urge them to place their orders immediately. Further information concerning this may be secured from your local fertilizer dealers.

--S. R. Parker

## HALF AND HALF

A combination fungicide made up of half lime sulfur and half wettable sulfur has been rather widely recommended and is being used by a number of Massachusetts growers. The danger in using this combination is discussed in a recent issue of the New York Weekly News Letter. We quote from this letter. "In some years not favoring arsenical injury the injury with the half and half sprays has been less than with summer strength (1-50) lime sulfur. A grower who has used the mixture for two or three years with little injury may refuse to believe that the half and half spray is dangerous until a favorable season arrives and he receives devastating evidence of how unreliable the formula actually is. Half and half has been recommended in Canadian schedules for several years. Little injury was noted until 1942 when widespread serious spray burn was the result.

Ohio workers reported in 1930 that lime sulfur in combination with lead arsenate released more free arsenic when diluted 1-80 than 1-60, and 1-60 more than 1-40. They reported this effect was corrected by high-calcium lime. In 1932 they found that, even with 8 pounds of lime, lime sulfur at great dilution 'is not always as safe as desired.' Dutton reports that in Michigan, lime sulfur at 1/4 to 1/2 gallon per hundred with lead arsenate produced immediate and serious burning which was worse with 1/4 than with 1/2 gallon. He found adding lime would usually check the immediate injury 'but was not always dependable.' He found the elemental sulfur in combination sprays had no part in the injury which was 'entirely the result of extreme incompatibility of very weak lime sulfur with lead arsenate.' By 1940 the Ohio workers reported that flotation sulfur gave better control of apple scab than the half and half mixture and that the addition of the elemental sulfur added little to the fungicidal value of the half strength lime sulfur alone. Later Ohio reports summarize data compiled over a number of years and conclude half and half is both more dangerous and less effective than flotation sulfur paste."

## WHERE WATER STANDS

The effects of submerging the roots of an apple tree are clearly shown in some recent investigations in Ohio. One-year trees were placed in a specially built chamber where environmental conditions resembled days in May and June in central Ohio. The trees were growing in soil in 10-gallon butter tubs. Tests consisted of measuring photosynthesis (food manufacture), transpiration (water vapor loss), and leaf growth shortly before and after the roots were submerged.

In these tests photosynthesis showed a downward trend the day after the flooding began. Transpiration showed a definite downward trend a week

later. Both processes were almost stopped within three weeks. The rate of increase in number and size of leaves on the shoots also was markedly inhibited. On the basis of several of these tests it was concluded that under these conditions leaf metabolism was injured from one day to two weeks after start of the flooding period. The length of time the trees could resist the effects of excess water seemed to depend upon the variety, the initial vigor of the trees, and the evaporating power of the surrounding air. Some trees could be killed in a week, others would remain alive for two months. If, in some cases, the water were drained from the soil two weeks after the submersion period started, the trees did not recover for two weeks or more. Some trees never returned to their original status. In a number of Massachusetts orchards the water table was so high this spring as to make it impossible to get on the land with a power sprayer before blossoming time. It is easy to visualize the handicap under which such trees are growing. They may survive and produce some apples over a long period of years. They cannot possibly produce maximum crops, however, where the soil is so poorly aerated even during the early part of the growing season. Large annual yields are associated with deep rooting and good aeration of the soil.

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A slogan for Victory Gardeners - "WEED 'EM AND REAP."

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## HANDLING APPLES FROM TREE TO TABLE

A well illustrated publication under this title (Circ. No. 659), has recently been written by D. F. Fisher of the Bureau of Plant Industry. It is available from the Superintendent of Documents, Washington, D. C. (price 15 cents). Following are the topics discussed:

The grower's responsibility. When to pick apples, Criteria of maturity. When to pack apples. Factors affecting condition during storage. Maturity at harvest. Storage temperature. Gas storage. Atmospheric humidity. Storage with other products. Fungus diseases. Bruising and other mechanical injuries. Physiological diseases. Effects of packaging. Prepackaging for the consumer. The shipper's responsibility. The dealer's responsibility. The industry's responsibility.

We quote a few introductory statements in this Circular. "The condition of apples offered for sale by grocers and other retail vendors is sometimes disappointing to the purchaser. To the extent that the demand for apples is influenced thereby it affects the market price of the fruit and the returns to the grower. The factors of condition that are most important are the stage of ripeness of the fruit and its freedom from decay, bruising, and other injuries. Growers who invest a season's work in pruning, fertilizing, spraying, and cultivating their orchards with all the care and expense necessary to produce a clean crop of high-quality fruit cannot help being disturbed by the poor condition of apples offered by retailers, which also constitutes

one of the greatest handicaps to success of organizations established by the apple industry to advertise and otherwise promote the sale and use of apples."

## CUTTING HAY IN AN ORCHARD

In an attempt to furnish some timely and up to date information on the question, "How essential is the cutting of hay in an orchard?" the writer asked William G. Colby, Research Agronomist, a few pointed questions, as follows: "If hay is cut and left lay, are moisture or mineral elements conserved?" "Is the cutting of a heavy growth of grass (2 to 3 tons per acre) more beneficial than the cutting of a light growth (1 to 2 tons per acre)? "Which is influenced more, transpiration from the grass itself or evaporation from the surface of the soil?" Dr. Colby replied as follows:

"The questions you raised in your memorandum of May 28 concerning the desirability of cutting grass in orchards raises a number of questions which unfortunately cannot be answered positively one way or the other. There are a number of factors involved whose relative importance is largely a matter of personal opinion. Nevertheless, I offer the following suggestions in the hope that they may be of some value.

"In my previous report four years ago, I suggested that cutting grasses after they have reached full maturity results in much reduced aftermath or rowen growth. In the case of bluegrass and orchard grass, this stage will be reached within a week or two. Some of the hay grass like timothy and redtop will require another three or four weeks. Cutting late may result in lower total dry matter yields for the whole season and will thereby reduce both the mineral and moisture requirements. In reply to your question as to whether or not moisture or mineral elements are conserved when a heavy crop of grass is cut and permitted to remain, I would like to say that in the case of minerals, they are conserved so far as the grass sod is concerned, but it is unlikely that this organic material will decompose and thereby release these mineral elements in such forms as they might be available to the trees. The grass sod would undoubtedly take them up again.

"With respect to moisture, it is probable that transpiration from the grass itself will be more affected than evaporation from the surface of the soil since any grass cover which produces two or three tons of hay to the acre will have such a dense sod that little bare ground is exposed whether the grass is cut or not. With a light vegetative cover (one to two tons per acre) it is probable that cutting would have a temporary effect at least in reducing evaporation from bare ground surface. It would be my guess that transpiration from the grass itself would be considerably reduced with a heavy grass cover if it was cut late and the hay allowed to remain. There are undoubtedly other factors other than those I have named but which lie more in the field of pomology than in the field of agronomy. On the whole, I would be inclined to favor cutting the grass in orchards if such were possible so far as time, equipment and help are concerned. Cutting grass also tends to eliminate weeds and tends to favor sod forming grasses over 'bunch' grasses.

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## WORMS WILL NOT WIN THE WAR

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# Fruit Notes

July 20, 1943

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents:



## MEDITATION ON WEEDS (A Borrowed Editorial)

It is estimated that there are more than 25,000,000 Victory Gardens in the United States worthy of the name. Doubtless there are nearly as many more which the official tabulators - a snooty race at best - consider it undignified to count, though their owners would want to put in a good word for them in the Shakespearean vein of "a poor thing, but mine own."

The figure is important, now that the season of thriving weeds has arrived. It will explain a vast change which will be noticed in American character these coming months. Nothing converts one to philosophy like a lusty crop of witch grass in the corn or an eager host of pussley in the onion patch.

Bugs are a challenge to war. Weeds, developing their growth unobtrusively, call out the virtue in a man. Over them he meditates upon the newer concepts of space and time. They inveigle him into botanical surmises, school his temper, harden his will, stain his fingers, tutor him in the lore of a backache, instruct him in the art of hoeing, and send him to Hesiod for solace when all is done. He is not amazed to learn that there are more than 2,000,000 different kinds of plants. He can verify the figure himself! How much calmer we shall all be by Autumn!

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Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

"THE FIRST DAY ON A FARM"

Massachusetts farmers are facing the biggest job of training new workers they have ever had. Hundreds of people, inexperienced in farm work are going on farms to assist in the planting, cultivating and harvesting of crops and the care of livestock. In general, these people will be willing but are completely inexperienced. The results obtained from this inexperienced help will depend a great deal upon the "breaking-in program"which farmers employ.

Greeting the New Farm Worker - There's a Wrong Way and a Right Way

A schoolboy has decided to help with farm work, and has been assigned or directed to go to a certain farm. He has just arrived by bus and finds Farmer "A" in the barn wherethe following conversation takes place:

Farmer "A" - "Hello, Bub. What do you want?"

Boy - "I was sent here by Mr. Green, the County Agent, to help you with your farm work."

Farmer "A" - "You look pretty puny to me to be much good on this farm. How old are you, anyway?"

Boy - "I am sixteen, sir. While I'm not as tall as some of the boys I think you will find I can take it. I have delivered papers for the past two years and played on the scrub football team."

Farmer "A" - "Well, you'll find farming isn't football. It's hard work from before daylight until after dark. We farmers have a hard life and you'll soon find that out. Did you ever work on a farm?"

Boy - "I have never worked on a farm before, sir, but I am certain I can learn if you will show me."

Farmer "A" - "Well, take that fork and go down there and clean up that cow stable. Let's get going."

Such an approach makes a boy or any other eager and enthusiastic but inexperienced worker feel that the farm job is the hardest, most difficult to learn, and will dampen enthusiasm, shatter morale and cause him to work below top effectiveness.

Let's see how the young farm worker might better be handled. (Boy gets off from a bus and finds Farmer Bill Smith in the barn.)

Mr. Smith - "Good morning. Aren't you John Brown, the young man Mr. Green told us would come out to help with the farm work this summer?"

John - "Yes, sir, I am John."

Mr. S. - "Well, I'm William Smith. They call me 'Bill.' Mind if I call you 'Jack?'"

J. - "No, sir, that's what all my friends call me."

Mr. S. - "Fine, I'm glad you are here to help us, Jack. Let' sit down here and get acquainted and I'll tell you something about our place. Have you ever worked on a farm, Jack?"

J. - "No, sir, but I have worked summers delivering groceries and I carried a paper route. Then of course, I worked around our yard but it isn't farm work."

Mr. S. - "Well, don't worry about that, Jack, I know you are going to like farm work and I will show you all about the jobs you will have to do. Farming is mighty fine work. It is mostly outdoors where we have plenty of fresh air and sunshine. By the way, that's why lots of people play golf: to get plenty of fresh air, sunshine and exercise. Well, we have all three right here on this farm. You are working with growing plants and animals and you learn a lot that will be of real interest and help you as long as you live. By the way, my wife wants to meet you. She told me to bring you up to the house when you came. Boy, is she a good cook! She puts out lots of good food and plenty of it."

They go into the house where Mr. Smith introduces Jack to his wife who carries on a pleasant conversation with him, telling him she is glad that he has come to help them.

Mr. S. - "Well, Jack, let's go out to the barn now. Just as you were coming I was about ready to start cleaning out the cow stable. That isn't the most interesting work we do around here but it is a job that has to be done every day. You see, on this farm we produce milk, and babies in the cities drink this milk. The milk has to be clean and sweet and wholesome. We can't produce good cleann milk in a dirty cow stable so we try to keep our stable and our cows nice and clean all the time. Do you want to take that fork over there and we will clean this up and when we get done we will do something else."

This conversation continues with the main object of getting acquainted. Jack is shown his room. The importance of dressing safely is explained to him so no loose tie or long unbuttoned sleeve or any part of his clothing would be likely to causo him to trip or be caught in a machine.

The first dayy on any new job is the most important for developing attitude and morale. The new worker should be made to feel that his contribution is important, that he is doing necessary work, that he will not be expected to know all the answers but he will be carefully shown how to do each job. If he is not accustomed to rather vigorous work, he should be told not to go too fast or hard unless he is able to do so without unusual tiring or fatigue. (Adapted from a talk given at Baltimore, Maryland, February 12, 1943 by L. J. Fletcher, War Activities Committee, American Society of Engineers.)

--Roy E. Moser

# Do You Know:

That McIntosh apples can become infected by scab during July only if they remain wet continuously for 35 to 40 hours? During August a wetting period of 40 to 60 hours is required for scab infection while 3 to 5 days of continuous wetting are necessary in September, according to O. C. Boyd. At the same time young leaves may become infected in 6 to 8 hours while older leaves require 15 to 20 hours.

That per capita consumption of food in peace time is somewhat more than 3 pounds a day while soldiers require 5¼ pounds? In a theater of war, a fighting man eats two-thirds of his food out of tin cans.

That 83.8 million of the 127.5 million bushels of apples grown in the United States in 1942 were sold commercially as fresh apples? Other channels of distribution accounting for the balance (expressed in millions of bushels) are: Food distribution administration - purchases, fresh, 2.5; Cold packed, .5; Canned, 11.8; Dried, 7.9; Other Mfg., 9.; Farm household, 5.; Unharvested, 7.

That Barnstable County, Massachusetts ranks 52nd among the counties of the United States in strawberry acreage and 17th in strawberry production? This indicates that strawberry growers in the Falmouth area have a per acre yield of approximately three times the average yield in the United States.

That several fruits, including cherries, plums, grapes, and currants, will develop normal color in dense shade? The red coloring material in apples, however, requires at least partial exposure to sunlight for its development.

That a valuable oil is now being extracted from the seeds of grapes? Grape seeds contain 10 to 17 per cent oil on a moisture-free basis. The 900,000 tons of grapes normally used in making wine in California will yield more than 3,000 tons of oil. The oil is semi-drying and may be used in paint.

That Yakima County, Washington is the leading apple producing county in the U. S.? The crop last season from about one and a quarter million trees amounted to more than 10,500,000 bushels.

That a silvery condition in apple leaves, commonly known as Silver Leaf, is caused by a wood rotting fungus? The silvering is due apparently to a toxin or poison produced in the trunk or branch and carried upward into the leaves.

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Extension Leaflet No. 26, "Cultural Practices in Bearing Apple Orchards," by J. K. Shaw, has been completely revised and brought up to date. It includes the following sections: Ideals in Apple Growing, Plant Food Requirements, Response to Cultural Methods and Fertilizers, Different Elements of Fertility, Minor Elements, Water Supply, Types of Soil Management, and War Emergency Practices. A copy may be obtained from your county agricultural agent.

SEEN AND HEARD IN THE FIELD

Apple roots under a decaying mulch. It is difficult to imagine more nearly ideal conditions for apple root development than those existing just beneath a decaying mulch. Moisture supply, aeration, mineral elements (including nitrogen in nitrate form), and the absence of competition from grass, combine to favor growth and maintenance of the apple roots. This condition is well illustrated in several Nashoba orchards where a mulch accumulated over a long period of years is paying good dividends. It takes about three years before the nutrient materials stored up in dry hay are again made available for the tree. Decay is hastened by nitrate applications.

Ben Davis affects adjacent McIntosh. A striking example of cross pollination was recently observed at a twilight meeting at Apple d'or Farm where a block of McIntosh trees adjoins a block of Ben Davis. Where the two varieties are adjacent, the set of McIntosh is exceedingly heavy, much more so than where the McIntosh trees are next to Baldwins. The old Ben Davis may not be much of an apple to eat out of hand, but it ranks well with Delicious, Cortland, Astrachan and others as a pollenizer.

Fighting scab successfully in a difficult season. When someone asks the question, "Doesn't everyone have a lot of scab in McIntosh trees this year?" we can truthfully say that scab is almost completely under control in a number of the larger commercial orchards. One such orchard has received no lime sulfur and needs none. The sprayer has a capacity of 30-gallons per minute and maintains a pressure of 600 pounds with two 8-nozzle "brooms" in operation. Wettable sulfur has been supplemented by sulfur dust. The foliage looks unusually well. Of course, not all McIntosh growers can justify so large a sprayer. Neither can they afford both a sprayer and a duster. Lacking these highly desirable pieces of equipment, a grower must of necessity take more time in spraying each tree. Faulty coverage is probably responsible for at least nine-tenths of our scabby foliage and fruit.

A would-be strawberry grower. An individual writing to the State College for information on strawberries said, "Last year I placed a handful of fertilizer in each hole where I set my strawberry plants, and the plants failed completely. This year I'm going to try lime," (An example of "spoon feeding" at its worst, - all too common among amateurs. It illustrates the difference between building up soil fertility in advance, and handing out generous gobs of this and that for immediate consumption.)

Biennial McIntosh. One Sterling McIntosh orchard has alternated for the past four or five years between very heavy and very light crops. Terminal growth is less than normal. The trees look relatively thin, and the cover crop is lacking in vigor. All signs point to a nitrogen shortage. The soil is fundamentally good but needs a thorough overhauling. If, through soil improvement, a hay crop of two tons or more per acre is produced, the trees should then make the kind of growth which accompanies annual bearing.

Young apple trees show brown leaves. In one end of a South Amherst orchard of 2-year-old apple trees, the leaves show severe browning. It isn't spray injury because they haven't been sprayed, and it isn't at all typical of

magnesium deficiency. The soil is strongly acid and lacking in organic matter. Leaf analyses show very little potash. An old orchard was removed before the present trees were set. The young trees will undoubtedly respond to a program of soil improvement including an application of dolomitic limestone and a complete fertilizer. Other possibilities are stable manure and heavy mulching. Or as one individual remarked, "Jack up the trees and put some soil under them."

Strawberry crown girdlers invade a house. At a recent twilight meeting a grower referred to a particular beetle which he had found in considerable numbers in his house. He had no difficulty in capturing half a dozen which he mailed to the State College for identification. They proved to be the Strawberry Crown Girdler, which has a habit of seeking shelter in houses.

A good idea, except - At another meeting a grower said that he had seen many curculio beetles feeding on dock leaves in his orchard and wondered if this pest might be poisoned there instead of in the trees. There seems to be only one thing wrong with the idea. The insect in question is definitely not curculio.

Apple maggot and cold storage. We hesitate to waste the time of readers of Fruit Notes with this one, but it provoked some discussion at a twilight meeting. It was offered by the owner of an orchard whose standards in pest control may be judged by the fact that his first spray for scab was applied after bloom. He claims to prevent apple maggot damage in winter apples by placing them promptly in cold storage. The truth of the matter is that most of the maggots fail to survive very long anyway in a hard apple and even though they are destroyed within a few days or a month at most by cold storage temperatures the apple still bears the telltale tunnels, and from a grading standpoint is "railroady" or maggot infested. The storage idea is not new. In fact, it has been carefully investigated to determine the effect of cold storage on this unwelcome summer visitor. (We shall continue to recommend poisoning the fly instead of freezing the maggot.)

## PRODUCTION IN A 45-YEAR-OLD APPLE ORCHARD

A row of eleven 45-year-old McIntosh apple trees in a State College orchard has been cut down,, not because the trees were no longer producing profitable crops but because they were expensive to maintain, the fruit was somewhat inferior in color and the land was needed for a new planting more suitable for modern research work. The crop in 1942 was the second largest in the life of the orchard.

Records of the yield of these McIntosh trees from 1920 to 1942 inclusive, have been kept. The average annual yield of the 11 trees from the 22nd to the 45th year was 25.4 bushels per tree or 686 bushels per acre of 27 trees. The prize tree produced 88 bushels in 1939 and averaged 38 bushels per year or 1064 bushels per acre for the 23 years; the lowest yield from a permanent tree was 23 bushels, or 621 bushels per acre. Two of the 11 trees were replaced dur-

ing the 43 years and one weakened and died shortly before the row was removed. Omitting these three trees the average annual yield was 30 bushels per tree, or 810 bushels per acre.

Yields of four additional varieties for a period of 14 years, 1923-1936 inclusive, are available. The average annual yields of all five varieties for this period were R. I. Greening, 16 bushels; Wealthy, 13 bushels; Ben Davis, 15 bushels; Baldwin, 10 bushels; and McIntosh, 22 bushels. This shows one reason why McIntosh is preferred by our growers; it yields more, largely because it is an annual bearer. Wealthy and Ben Davis could well be planted more than 27 trees per acre so they should be regarded as better producers than the above figures indicate.

--J. K. Shaw

## UNSCRAMBLING VARIETY PUZZLES IN THE NURSERY

The 23rd annual examination of nurseries for trueness-to-name began on July 12, and it will require about a month for three men to complete the work. It is some job to learn and remember the varietal characteristics of the many varieties of apples, pears, plums, cherries, and peaches that will be examined. We propagate many varieties in our own nursery where they can be studied at various stages of development. There are now in our nursery varieties of various tree fruits as follows: apples, 61; pears, 47; plums, 59; cherries, 36; peaches, 53, ornamental crab apples, 31. Total 287 varieties. They include many varieties that are new or little known and which may appear in nurseries either as new introductions or substituted for other varieties. The numbers given above do not include "strains" or bud sports of apple varieties such as Starking, Red Spy, and about 20 possible sports of McIntosh. Many varieties are represented by both one-year and two-year trees. We have 25 clonal stocks of apples, several of which are used for the apple varieties. There is a total of nearly 1000 distinct lots of trees in our nursery. Is it any wonder that nurserymen sometimes make mistakes?

A bulletin describing and illustrating nearly 100 varieties of apples is in press; one showing 42 varieties of cherries has just been published, and others dealing with pears and plums are in preparation.

--J. K. Shaw

## MAGNESIUM DEFICIENCY

The season is at hand when magnesium deficiency may show up in apple orchards. The typical symptoms are relatively easy to see although other causes may manifest symptoms which are quite similar. So one should not be too hasty in assuming that a shortage of magnesium is necessarily the cause of a suspicious orchard trouble that merely "looks something like" the symptoms described for magnesium deficiency.

In late July or early August, apparently healthy trees will suddenly show leaf scorch in the form of irregular brown blotches. These blotched sections along the leaf edge or more likely on the blade itself are dead areas and naturally interfere with normal leaf functions. The older leaves near the

bases of the present year's shoot growths are affected first, but soon leaves farther up the shoots may show the trouble. Affected leaves often drop off, and branches which appeared normal in June and early July may lose all their leaves by mid-September except for a few close to the tips of the shoots. Sometimes, however, the scorched leaves seem to cling tenaciously, especially on older trees, and more often with some varieties than others, spur leaves are likely to scorch severely without dropping. Yellow banding and mottling of leaves are symptoms of the deficiency with some varieties, but not so much with our main varieties, McIntosh, Baldwin and Delicious. Magnesium deficiency not only seems to increase preharvest fruit drop but "hormone" harvest sprays are much less effective on such trees.

As reported before, magnesium deficiency is usually associated with acid soils although this is not necessarily the case. Also, heavy use of potash has seemed to increase the trouble. Suggested control measures include the application of adequate amounts of high magnesium limestone worked into the soil if possible, plus the supplementary use of magnesium sulfate (Epsom salts) or some other soluble magnesium compound. However, this deficiency has been somewhat difficult to correct in England and Canada where it has been recognized for a number of years. It yields less readily and less quickly to treatments than deficiencies of nitrogen, potassium, or boron, for example. For some reason, affected trees are slow to take up added magnesium. It is important, therefore, that growers determine as soon as possible if their trees are affected with this deficiency so that control measures can be started.

Experiments are under way at Massachusetts Experiment Station and elsewhere to determine the effectiveness of various treatments.

--Lawrence Southwick

## HARVEST SPRAYS AND DUSTS

In 1942, spray and dust applications to control preharvest drop were compared in the Experiment Station orchards at Amherst on Duchess, Wealthy, amd McIntosh. Applications on mature McIntosh consisted of about 30 gallons of spray and 3 pounds of dust, and on Wealthy and Duchess similar liberal applications according to tree size. The following selected data give a good picture of the results in general. Spray concentrations are 10 parts per million (p.p.m.) unless otherwise noted. (The numbers indicate commercial brands of sprays and dusts.)

| Variety | Treatment | Date of Application | End of Test Period | Percent Drop |
|---|---|---|---|---|
| Duchess | check | - | Aug. 14 | 54 |
| | dust (#4) | Aug. 5 | Aug. 14 | 29 |
| | spray (#1) | " " | " " | 7 |
| Wealthy | check | - | Sept. 5 | 22 |
| | dust (#2) | Aug. 21 | " " | 22 |
| | spray (#1) | " " | " " | 21 |
| | spray (#2) | " " | " " | 12 |
| | spray (20 p.p.m.) | " " | " " | 8 |
| | spray (40 p.p.m.) | " " | " " | 4 |

(Continued)

| Variety | Treatment | Date of Application | End of Test Period | Percent Drop |
|---|---|---|---|---|
| McIntosh | check | - | Sept. 19 | 26 |
| | dust (#1) | Sept. 8 | " " | 26 |
| | dust (#2) | " " | " " | 18 |
| | spray (#2) | " " | " " | 16 |
| | dust (#2) | Sept. 8 & Sept. 11 | " " | 14 |
| | spray (#1) | Sept. 8 | " " | 10 |
| | dust (#1) | Sept. 8 & Sept. 12 | " " | 8 |
| | spray (#1)(20p.p.m.) | Sept. 8 | " " | 7 |
| | spray (#1) | Sept. 8 & Sept. 12 | " " | 5 |

Tentative conclusions:

1. On Duchess and Wealthy, dusts were less effective than sprays.

2. On McIntosh, results with dusts were somewhat more favorable than on Duchess and Wealthy.

3. Two successive applications of dusts or sprays resulted in better control of preharvest drop than single applications.

4. Increasing the concentration of the active chemical in sprays gave better results on Wealthy.

It is suggested that growers in this state do not dilute commercial drop-control materials below standard strength. In general, spraying may be expected to be more reliable than dusting. Both sprays and dusts should be applied during hot weather if possible. Spraying in the middle of the day is usually best while dusting in the early morning when foliage is wet with dew may be advantageous.

--Lawrence Southwick

## MODIFIED RECIPES OF OLD TIME NEW ENGLAND PRODUCTS WILL SAVE SUGAR

Many New England farm families having available cull apples, a cider press and some means of evaporating the cider such as a maple sugar pan, can make themselves all the sweet syrup or sweet apple sauce they can use this winter.

Apple cider when it is freshly made from sound apples contains between 10 and 13% fruit sugars, and about one half of one percent of fruit acid. If six quarts of cider are concentrated by boiling to one quart, a syrup will result which contains about 60% sugar and about 3% acid. This amount of acid is too much for most people's taste and it masks the natural sweetness of the syrup. The acid can be eliminated very simply by adding 1/2 level teaspoonful of baking soda per quart of fresh cider. After the soda is added and the foaming subsides, the cider should be boiled down to a syrup which should be filtered through cheese cloth, heated to boiling, and filled into pint jars or bottles which are sealed and processed in a boiling water bath for 15 minutes.

For the production of apple syrup in any quantity it is suggested that a maple syrup pan or evaporator be used. Care is necessary not to caramelize the juice. About 1/3 to 1/2 ounce of baking soda per gallon of fresh cider is required to partially neutralize the acid. The syrup is ideal for pan cakes, waffles or for any use for which maple syrup or corn syrup is commonly used. If held through the winter it can be used for canning acid fruits and berries next season. Following are a few suggested recipes:

Sweet New England Boiled Cider Apple Sauce. Take 1½ pounds of firm, medium tart, solid apples; peel, halve, remove cores and cut each half in quarter slices. Cook these slices slowly in 1 cup of the above syrup for 10 minutes in a sauce pan with lid on. Pack the apples in pint jars and cover with the syrup they have been cooked in. Seal and process in boiling water bath for 15 minutes.

New England Apple Butter (without added cane sugar). Take 12 pounds of solid, tart apples (Baldwins, Spys, etc.). Wash apples, cut out calyxes, halve, remove seeds and cut into thin slices. Cook in large kettle with one gallon of sweet (unconcentrated) cider. When thoroughly soft, put through colander or sieve. Return pulp to pan and concentrate by boiling until quite thick. (Use care or it will burn.) When thick add 1 quart of sweet cider syrup and 1 tablespoonful of cinnamon and ¼ tablespoonful of cloves. Continue cooking with constant stirring until the boiling material will heap up well on the spoon and flow from the spoon in sheets. Pour the hot butter into clean, dry jars, and seal and process in a boiling water bath for 15 minutes.

Please note the following:

1. Only freshly prepared sweet cider contains the sugar necessary in the preparation of this syrup. Fermented or old cider will not make a sweet syrup.

2. Do not use benzoated or preserved cider. A bitter syrup will result if preserved cider is concentrated.

3. The addition of too much soda will cause the cider to turn very dark. If this darkness is caused by soda alone, the addition of more fresh cider will brighten the syrup.

4. Be careful not to burn or caramelize the syrup. The finished syrup should be a light red and have a sweet apple flavor without a pronounced caramel taste.

5. Do not attempt to concentrate cider in a container which has an exposed iron surface. A black syrup will result.

(If further information is desired, write to the Department of Horticultural Manufactures, Massachusetts State College, Amherst, Mass.)

--F. P. Griffiths and J. J. Powers

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Inexperienced apple pickers need careful training. Some suggestions will be offered in August FRUIT NOTES.

# Fruit Notes

September 8, 1943

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## SOME SUGGESTIONS FOR HANDLING INEXPERIENCED APPLE PICKERS

At least 2,000 apple pickers will be needed in the Nashoba area this season, in addition to those to be recruited locally. At least a third of these individuals will be picking apples for the first time. It will therefore be highly desirable that time be taken at the start to instruct these new workers in the easiest and best way of removing apples from a tree. Let's not assume that the newcomer knows just how we want the apples handled.

In the rush of getting the apple crop picked in a few days, many growers are in so much of a hurry that they give the new picker a basket and ladder, and tell him to "go to it." Where apple pickers are paid by the bushel, there is a strong urge to get off just as many bushels as possible in a day without

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too much regard for bruises or pulled stems. It may be a good idea to pay a liberal hourly wage the first day, and then go on a bushel basis the second day. If at all possible, an experienced picker should supervise the work of not more than 8 or 10 inexperienced pickers. To send out a group of high school boys without previous instruction or adequate supervision is one of the easiest ways to reduce the value of the crop. No factory superintendent would think of breaking in a new worker that way.

First of all, a new picker should be shown how to separate an apple from the spur, with the stem intact. The stem will separate easily from the spur if the apple is tilted upward instead of being pulled off. And instead of pressing the fingertips into the cheek of the apple and giving it a pull, it is an easy matter to cup the apple in the palm of the hand and break it off with a lifting motion. Not more than two apples at the most should be held in the hand at one time, and then only if they can be held without touching each other. The apple is then laid into the basket or pail and not dropped into it. Speed in picking does not require pulling apples from the tree nor dropping them into the container. Some of the fastest pickers harvest fruit which shows the least bruises.

Then, such simple matters as picking apples from the lower part of the tree first should be stressed. All apples within reach of the ground should be picked before placing the ladder. This prevents bruising from the ladder itself or through dropping apples from higher branches. In placing a ladder, caution the new picker about setting it evenly on the ground and always against a stout branch, and not at too great a slant. Even though the picker is not too concerned about taking a tumble, explain to him that ladders cost money and are not easily obtained. Also, advise against trying to pick from the ladder, apples which are almost out of reach. Reset the ladder, if for only a dozen apples.

Patience, tact, diplomacy, and occasionally firmness will be needed with those new pickers. Pay them well and at the same time help them to help themselves in doing an important job.

## NURSERY INSPECTION - 1943

For the 23rd consecutive year, men from the Massachusetts State College have completed the examination for trueness-to-name of nursery fruit stock in the Northeastern part of the country. This year 18 nurseries located from New England to Michigan and Virginia were examined and misnamed trees correctly named or cut down. The report on a rather large nursery of an examination for the first time reminds one of the old days when we really found misnamed trees. Repeated visits always greatly reduce the number of mixtures, and smaller nurseries may be found completely free of misnamed trees. In some nurseries all salable stock was examined and in some only certain fruits were gone over. Peaches are in a class by themselves. Unlike other tree fruits, certain varieties are so much alike in the nursery row that they can be identified only with difficulty or not at all. Nevertheless, many misnamed trees are detected. A list of the nurseries examined may be obtained on request from the Department of Pomology, Massachusetts State College, Amherst, Massachusetts.

---J. K. Shaw

NOTE: The Fruit Notes mailing list is in the process of being revised. If you have received a letter (on pink paper) regarding the revision and desire to continue receiving this publication, be sure it is properly filled out and returned to the Mailing Room.

# Do You Know:

That the principal subsistence of the United States comes from about 30 crops? All told, our farmers grow about 300 different crops. This is about the average of temperate zone nations. China, on the other hand, produces and harvests about 6,000 different plants of nutritional value, which is one reason why that country has been able to survive the Japanese onslaught.

That allowing pears to remain on the tree until sufficiently mature reduces the astringent properties, tendency to wilt in storage, and on susceptible varieties, scald in storage? Leaving the fruit on the tree too long causes deterioration in quality and may cause trouble in storage or transit such as core breakdown and too rapid softening. Fruit rots are generally more prevalent in pears that are harvested and packed when too mature.

That the term "Horticulture" originally referred to the growing of crops within walls as distinguished from the growing of crops in open fields? Today the term relates to the cultivation of gardens or orchards, including the growing of vegetables, fruits, flowers, and ornamental shrubs and trees. There is no hard and fast line of distinction between horticulture and agriculture although the wheat or corn farmer is strictly an agriculturist, while the grower of any of the specialty crops, whether for food or ornamentation, may be considered as a horticulturist.

That mid-day seems to be the ideal time for applying hormone sprays? Preharvest sprays containing napthalene acetic acid used on Williams, Delicious, and Stayman Winesap apples were more effective when applied at certain concentrations at mid-day than at mid-morning, according to L. P. Batjer of the Bureau of Plant Industry, Beltsville, Maryland. He found that early morning sprays required nearly an hour to dry compared with a half hour at noon, but that apparently absorption was much more rapid at the higher temperatures. 75° F. may represent the critical point above which the temperature may not be an important factor.

That no less than 7 different brands of materials intended for preventing preharvest drop of apples are advertised in one of the fruit magazines? All of these materials contain the same essential ingredients and all may be expected to produce similar results if properly applied. None of them may be relied upon to give good results if haphazardly applied.

That borax applications on apple trees susceptible to internal cork tend to reduce the preharvest drop of fruit as well as the drop through harvest, as compared to trees not receiving borax? An application on trees previously free from internal cork, has no apparent effect on the dropping tendency, according to experiments performed at Ithaca, New York.

That about 3½ million pounds of apple syrup were made in 1942? This year it is hoped that at least 15 million pounds will be produced for the pur-

pose of replacing glycerine used in processing tobacco. Tests at Michigan State College demonstrate the practicability of using dairy equipment in condensing apple juice. The dairy industry is becoming interested in apple syrup because this material can be substituted for sugar in the manufacture of ice creams and sherbets. One gallon of apple juice or cider can be condensed to 1 1/3 pounds of apple syrup.

That methods for extracting and preserving the juices of small fruits for beverage purposes have been developed at the New York State Experiment Station at Geneva? Strawberries, raspberries, dewberries, blackberries and elderberries have been used in the studies and satisfactory products obtained, particularly where the different juices have been blended with apple juice. Because the small fruits generally come on with a rush, making it difficult to handle the fresh fruits to best advantage, the possibilities of extracting juice from frozen fruits have been explored. With attention to certain details, frozen small fruits have proved to be an even more satisfactory source of juice than the fresh fruits.

That water core is likely to be more prevalent in the fruit of trees bearing a light crop? An examination of the fruit of 7 Duchess trees at Urbana, Ill. by W. A. Ruth has revealed these facts: (1) On all the trees, well colored apples and those with red tinted flesh tended to show more water core. (2) There was no correlation between size of fruit and water core. (3) Apparently a high leaf-apple ratio favored the development of water core but various other factors were also involved.

That softwood cuttings of beach plums taken in mid-June have been rooted successfully when treated with a root inducing substance? W. L. Doran and J. S. Bailey, using a rooting medium consisting of a mixture of 2 parts of sand to 1 part of peat moss, obtained 67% rooting on 4-inch cuttings of short new shoots or laterals treated with indolebutyric acid. The basal ends were emersed for 4 hours prior to planting, and rooting was obtained in 25 days.

That the utilization of commercial fertilizers in New England last year amounted to about 4% of the total used in the United States? New England consumption amounted to 390,327 tons while that in the United States amounted to 10,005,238 tons. Massachusetts used 81,876 tons, or a little more than half as much as Maine where 153,442 tons were used.

That the brilliant red color showing in the foliage of chokecherries for several weeks is due to X-disease, an incurable ailment of peach trees? Any grower planning to set peach trees next spring should first consider the destruction of all chokecherries within at least 200 yards.

That Hood River Valley fruit growers are asking their employees to take 10% of their pay in war bonds?

That each time a 16-inch gun is fired, 120 pounds of nitrogen goes back into the air from which it originally came?

## "HORMONE" SPRAYING AND DUSTING FOR LESSENING PREHARVEST DROP

With the McIntosh harvest season near at hand, the following comments and suggestions concerning "Hormone" sprays and dusts may be of interest:

1. Sprays are probably somewhat more reliable than dusts.
2. Apply spray on McIntosh as soon as sound apples begin to drop. A second application 4 or 5 days later should increase effectiveness and will probably be justified this year.
3. With dusts, two applications are recommended.
4. Spray, as nearly as possible, during the hottest part of the day. Applications are not very effective when the air temperature is below 70° F.
5. Apply dusts when air is quiet, preferably when trees are wet with dew and during hot weather.
6. Use plenty of material. Thirty gallons of spray or three pounds of dust are none too much for mature McIntosh trees. Thorough coverage is absolutely essential.
7. Use spray materials at standard strength (10 parts per million). This strength is usually recommended by the manufacturer. For increased assurance of effectiveness, use 1½ to double the standard concentration, especially when only one application is to be made. However, the standard concentration is likely to be sufficient if the spray is applied thoroughly and under favorable weather conditions, particularly as regards temperature.
8. Do not use lower than standard strength spray.
9. If McIntosh trees show severe symptoms of magnesium deficiency, drop-control applications probably will not be effective.
10. Remember that after about 10-12 days following an application, the "sticking" effect may be dissipated, resulting in heavy dropping. This is especially true with McIntosh and harvesting must be planned accordingly.

---Lawrence Southwick

## MAGNESIUM DEFICIENCY

Symptoms of magnesium deficiency are now prevalent in apple orchards. Dead, brown areas on leaves, often accompanied by yellowing, are typical of the trouble. Growers who feel certain that this trouble is present at all in their orchards are asked to drop a card to the undersigned at Mass. State College. We are endeavoring to get an estimate of the prevalence of magnesium deficiency in this state.

---Lawrence Southwick

## OUTBREAK OF SPOTTED TENTIFORM LEAFMINER

A general infestation of the Spotted Tentiform Leafminer has broken out in eastern Massachusetts orchards, principally in Middlesex County. Although all available reports on this insect state that "it has not been recorded as doing serious injury," the foliage in several orchards in this area is already definitely damaged. Many leaves have 10 or more mines in them and there is some yellowing and defoliation. The mines are about ½ inch long and ¼ inch wide, being pulled together in a fold or "tent" on the underside of the leaf.

The insect is named from the spotted appearance of the mine on the upper surface of the leaf where the chlorophyll is eaten in spots rather than completely. A similar leaf miner eats out the chlorophyll in the mines completely and is called the Unspotted Tentiform Leafminer.

The life history and seasonal history is very sketchily reported and apparently they have not been completely studied. References state that the moths emerge in the spring and the larvae pupate in September, spending the winter in the mines in fallen leaves, all of which indicates one generation annually. However, the infestations recently observed definitely show 2, and perhaps 3 generations this year.

On August 11 to 13, moths were emerging and laying eggs for a generation which will develop in September and October. These moths "flew up" in clouds from the heavily infested trees resembling a bad infestation of leafhoppers in September.

It is evident that the usual sprays of lead arsenate and sulfur have little effect on these leafminers since well-sprayed leaves were badly infested. Nicotine sulfate and probably other ovicidal sprays should be effective but they must be timed carefully and applied thoroughly. Theoretically, 7 to 10 days after the moths emerge, at which time the larvae are hatching and starting their mines, will be the most effective time to spray. Preliminary trials with nicotine sulfate and with DN-111 did not kill full grown larvae and pupae in the mines.

---W. D. Whitcomb

## PRESENT STATUS OF APPLE LEAF-CURLING MIDGE

The Apple Leaf-Curling Midge is now generally spread throughout eastern Massachusetts orchards. No practical control of this pest in commercial orchards by spraying has been discovered due principally to the necessity for spraying the unfolding buds each 3 or 4 days during the egg laying period of the midge flies and to the migration of flies from tree to tree and orchard to orchard.

Operations which will reduce the abundance of the insect and delay its establishment in newly infested orchards are:

1. Spraying with oil emulsion or DN on the trunk and larger branches, especially within loose bark, cavities and crotches at dormant or delayed dormant application.
2. Broadcasting naphthalene flakes at rate of 2 pounds per 100 square feet under infested trees about blossom time.
3. Cultivating under the trees about blossom time.
4. Using nicotine sulfate in the calyx and 1st cover applications.
5. Pulling and burning water sprouts during July and August to kill the second and third generation maggots.
6. Hand picking of infested leaves, especially on grafts and small trees.

---W. D. Whitcomb

## ORCHARD SPRAYING EXPERIMENTS NOW UNDER WAY IN AMHERST AND WALTHAM

Regardless of the many changes which have been forced upon us as a result of the war effort, the battle against insect and disease pests continues uninterrupted. In fact, the study of new materials by the departments of Entomology, Botany, and Pomology has been intensified rather than diminished.

In order that fruit growers throughout the state may be informed of the nature of the experiments which are being conducted for their benefit, both at State College and Waltham Field Station, we are listing them in this issue of "Fruit Notes."

1. A study of proposed substitutes to replace or supplement present standard materials and practices giving special attention to replacement of materials subject to curtailment because of the war emergency. These include some of the non-arsenical compounds such as fixed nicotine sprays and nicotine-pyrethrum compounds. (Amherst)

2. Tolerance tests on standard varieties of apples of early summer applications of DN sprays. The purpose of these tests is to determine the relative safety to foliage of applications at different periods of the growing season and under different conditions of temperature and humidity such as may be encountered in summer applications for the control of red mite. (Amherst and Waltham)

3. Compatibility of Fermate, with and without lime, in standard spray combinations. (Amherst)

4. A study of materials which are being sold as bee repellents. The purpose of these experiments are:

a. To determine the effect of a particular repellent, in combination with a standard orchard spray, upon blossoms and leaves of fruit trees.

b. To determine how the repellent may act and the duration of such action.

c. To determine the efficiency of each material as a repellent to bees. (Amherst)

5. The effect of measured gallonage as an indication of thorough coverage. This is a continuation of last year's experiment using Plum Curculio as the test insect.

6. A comparison of Cryolite with lead arsenate and the compatibility of Cryolite with Fermate. (Waltham)

7. A study of the effect of a complete spray schedule using DN-111 and Fermate with lead arsenate added in the calyx and first cover sprays. (Waltham)

8. A study of the comparison of Fermate with various standard wettable sulfurs. This experiment with test plots in various orchards throughout the state is associated with the Northeastern Spray Conference Cooperative Project. (Amherst)

9. A study to determine the effect of the addition of lime to the standard lead arsenate-wettable sulfur mixture upon the initial deposit and loss of sulfur from weathering. (Waltham and Amherst)

10. A study of the comparative scab control and rate of loss from weathering of coarse and fine grades of wettable sulfur. (Waltham)

11. A study of the effect of different rates of dilution of wettable sulfur and the fungicidal value of lead arsenate. (Waltham and Amherst)

12. A study to determine the effect of various wettable sulfurs and lime sulfur in burning out scab. (Waltham)

13. A study to determine the cause of fruit russetting and the time during the spraying season when apples are susceptible to this type of injury. (Waltham)

14. A study of substitutes for sulfur and lead arsenate in relation to insect and disease control and the prevention of fruit russet injury. (Waltham)

---O. C. Roberts

SIDELIGHTS ON THE 1942 HARVEST

Last year when many types and ages of individuals picked apples, the experiences of va rious growers are proving of great help in the 1943 harvest. Several growers have remarked that some of their most valuable pickers were husband and wife combinations. Together they finished the tree completely, the man placing the ladder and picking the upper branches while his wife picked from the ground.

Part time workers also did a good job in many orchards. Ambitious factory workers who found it possible to put in three or four hours picking apples in a nearby orchard came to the orchard with a definite purpose in mind and made an excellent showing. In contrast certain people who spent 8 or 10 hours in the orchard picked less efficiently.

A disastrous experience with a group of high school boys under no supervision is worth mentioning. Experiences of this kind must be avoided this fall. One grower said that he hired 25 high school boys who in his absence staged a pitched battle with Fancy apples. The next day he "fired" all but one of the 25. Without in any way excusing the boys for their actions, the writer believes that the grower was as much at fault as the boys. At least his ability as a tutor is subject to criticism. And perhaps he doesn't recall his own 'teen age shortcomings.

Another experience involved a group of junior high school youngsters who were transported to an orchard under the mistaken notion that anyone could pick apples and were then told by the owner that he did not need them. To make matters worse, they were compelled to walk home, a distance of about three miles. These youngsters are not interested in picking apples this fall. We must build good will not only among consumers but among prospective pickers. Next year may be worse than this from the standpoint of getting efficient apple pickers.

A few firemen found their way into apple orchards last fall and did a first class job. Being accustomed to climbing ladders, they were right at home picking the tops of trees. It is unfortunate that we haven't enough firemen in Massachusetts to pick the entire crop.

One grower paid his pickers in part with apples, and with good apples at that. One paid a bonus to pickers who stayed through the season. Still another rewarded his key men in a special way during the picking season. Unable, because of duties other than picking, to cash in on the good wages received for piece work, they gained through a substantial voluntary "raise." We pass these ideas along for what they are worth.

# Fruit Notes

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October 21, 1943

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## THE MOUSE SITUATION IN MASSACHUSETTS ORCHARDS

Imagine setting 128 mousetraps on an orchard area of one acre, and catching 64 mice the first night and 30 the next! That was the experience of workers in the Fish and Wildlife Service who conducted a recent survey in a Brimfield orchard. This orchard has a heavy grass cover, and at the time of the survey in September, mouse signs were very much in evidence.

Quoting from a letter written by Robert M. Borg, September 29, "The mouse population in Massachusetts is high. There are more mice per acre in the western than in the eastern part of the state. Every tree base examined in all orchards covered, even where there was sparse cover, was infested with mice. And in one orchard in Franklin County out of 30 tree bases examined 12 trees were partially girdled. Many other orchards visited had a few trees partially girdled. The mouse population will vary from 80 to 100 or more to the acre. In one orchard near Brimfield actually 94 mice per acre were trapped. This high population is due in general to a favorable growing season, hence good cover and food conditions. With the present high population of mice, and if weather conditions are favorable, the mouse popu-

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

lation may reach extremely dangerous and damaging proportions. Orchardists should check their orchards immediately after the apple crop is harvested and where girdling occurs, the orchard should be treated at once with zinc phosphide apple bait to reduce the population and eliminate further damage to the trees."

In view of the large number of mice now present in our orchards, every apple grower in Mass. should place mouse control on the priority list, insofar as fall jobs are concerned. We cannot afford to lose vigorous young fruit trees at a time when maximum yields from our present plantings are urgently needed. Another job which should be completed even before we tackle the mouse problem, is that of finishing the apple harvest and getting the apples properly stored. October 25 should be the deadline for the apple harvest. In years past, too many apples have been lost by severe freezing in late October or November because they were either unpicked or left standing unprotected in a shed. All marketable apples should be stored in a cool, moist, rat-proof building. If a suitable storage is lacking the apples should be sold before cold weather sets in.

## STRAWBERRIES IN THE FALMOUTH AREA

Records have been assembled from four commission merchants by County Agent Bertram Tomlinson covering strawberry receipts from Falmouth growers for the years 1943, 1941, and 1939. The total shipments received by these concerns during the three years were as follows: 1943 - 419,800 quarts; 1941 - 652,515 quarts; 1939 - 938,606 quarts. The numbers of growers involved were respectively, 109, 150, and 211, while the average numbers of quarts per grower were 3840, 4350, and 4450.

From these figures it will be seen that the receipts of strawberries in 1943 were less than half those in 1939, that slightly more than half as many growers were in the strawberry business in 1943 and the average number of quarts per grower was somewhat smaller than in 1939. These facts indicate a shortage of help and to some extent disappointing prices in previous seasons. It is estimated that the above data includes approximately 75% of the Falmouth strawberry crop. Based on these figures the 1943 Falmouth strawberry crop was 35.6% below the 1941 crop, and 52% below the 1939 crop.

The drop in acreage for 1944 is not expected to equal that of the previous year. Strawberry growers on the whole made good returns on their investment this year, and despite the labor shortage, every effort has been made to maintain production up to the 1943 level. In many cases, this is being done by holding over a greater proportion of the old beds than would be done normally. Much depends on winter and spring weather conditions, but the crop outlook for 1944 is about the same as for this year. There has been a gradual increase in the quantity of berries shipped in the 24-quart crate which is now the most popular package. 84% were shipped in that type of container in 1943 and only 42.5% in 1939.

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WANTED - BOYSENBERRY INFORMATION. Many Boysenberry plants have been sold in New England. A summary of growers' experiences with this new fruit will be of interest. If you are experimenting with Boysenberries in your garden or on a commercial scale please jot down on a penny postcard any comments you may have to offer and mail to the writer.

# Do You Know:

That the output of 3,800 typical farms is required to load an average ship with Lend-Lease foods? The following list of items might constitute such an output: Eggs laid in one year by 230,000 hens; Milk production from 6,000 cows for one year; Meat from 5,000 hogs; Lard from 27,000 hogs; Wheat from 850 acres.

That total fruit production in the U. S. in 1944 will probably be about 11% smaller than in 1943? Prospects are that only the prune and grape crops will be larger, by 12 and 11% respectively, while deciduous tree fruits and grapes are expected to yield about 17% less than last season. Citrus fruit prospects are about as favorable as a year ago.

That large amounts of ammonium nitrate fertilizer are likely to be available for fruit growers during the coming season? This material carries about 33% nitrogen or approximately twice as much as nitrate of soda. It does not keep well in handling and if stored should be kept cool and dry. This new fertilizer may be widely used in New England orchards next spring.

That a number of items of farm machinery are no longer being rationed? An increase in the allocation of steel for farm machinery in 1944 has resulted in the removal of the following items from the rationing list, beginning October 16: dusters, disc harrows, tractors, moldboard plows, cultipackers, land rollers, grain binders and threshing machines. All other heavy machinery is still rationed.

That apple scab infection was so severe in certain unsprayed orchards this season as to result in almost complete defoliation by early September? O. C. Boyd and Thomas Sproston report commercial losses from apple scab ranging from a trace to 25% in sprayed orchards, and 50-100% in unsprayed orchards. A few inexperienced growers have attributed the browning of McIntosh leaves and later defoliation to spray injury, whereas lack of scab control was largely responsible.

That a total of 194,775 tons of lime, enough to make 3,900 car loads, is used every year in the United States in connection with agricultural insecticides and fungicides? Fungicides make about 2/3 of the total or 125,000 tons, and the insecticides make the remaining 69,775 tons. In apple orchards where large quantities of sulfur are being used, without lime, the soil is becoming so acid that the growth of ordinary grasses and weeds is greatly reduced.

That the attempt to control harmful insects dates back to the early days of the Roman Empire? Caterpillars on fruit trees could be controlled, according to Cato, by moistening the tips of the twigs with the gall of a green lizard. Pliny recommended that the bones of a mare's head be hung on

poles around the garden to control canker worm. In Pliny's time, all inhabitants in the area which is now the North Africa battle zone, were ordered to wage war against the locust. People were compelled to hunt the locust eggs and crush them, or to crush the young and adult stages. Neglect of this duty was punishable by severe penalties.

That a nation-wide poll places the total number of Victory Gardens in 1943 at 20,000,000? As a conservative estimate, all Victory Gardens grown this year total about 4,000,000 acres and produced 8,000,000 tons of food. An estimate of 25,000,000 families did some home canning during the summer and fall; 22,000,000 Victory Gardens, a 10% increase, is expected in 1944.

That the decaying remains of plants exert a very beneficial influence by facilitating the penetration of rainfall on a sloping area? Careful measurements in Ohio showed that 5=1/2 inches of the total annual rainfall soaked into the soil in a cultivated field, while 13 inches soaked into a forest soil. In an orchard, we may approach the conditions of a forest floor by applying a heavy mulch and by improving the cover crop.

That for the seventh consecutive year, American farmers set a new food production record in 1943? Nevertheless, there is not enough food in total to satisfy all the demands and there are definite shortages in a number of our favorite foods. The increases during the past seven years are indicated by the following percentages: 1937 - 101%; 1938 - 103%; 1939 - 106%; 1940 - 111%; 1941 - 115%; 1942 - 126%; and 1943 - 131%.

That about 5,000,000 pounds of dynamite are used annually for agricultural purposes? The various uses include ditching, land clearing, drainage, irrigation, stump blasting, and to a limited extent, fruit tree planting. Ditching constitutes one of the largest agricultural uses.

That 59 soil series and eight land types have been recognized in Massachusetts. Glacial till soils are most abundant and of these the Gloucester series is the most extensive, comprising 20.6% of the land area. Glacial outwash soils are second in expanse and of these the Merrimac is the most important, occupying 10.4% of the total area. A Key to Mass. Soils has recently been prepared by A. B. Beaumont, and is now available for distribution. If interested, ask for Special Circular No. 64.

That a codling moth infestation is likely to be more severe on trees adjacent to a packing house where boxes are stored during the winter, or to a pile of apple wood? In one case where a Massachusetts apple grower cut down a number of old trees and piled the wood next to the orchard, the infestation was so severe on adjacent trees that each apple showed one or more codling moth blemishes. The infestation was so heavy that the grower removed the entire crop from these trees during the summer and destroyed it.

That a mulch of straw or other suitable material on a strawberry planting may increase the yield by at least 50%? The ideal time for mulching a strawberry planting is about the time the ground freezes. In most localities this means early November. If mulched too early there is some tendency to smother the plant and if mulched too late there is likely to be some crown injury from low temperatures.

That detailed information is now available on the freezing of fruits, vegetables, and meats for home use? A mimeographed publication, Special Circular No. 1043, can be obtained from your county agricultural agent or from the State College. At least three new frozen food locker plants have been made available in Mass. during the past season. In addition quite a number of individuals have installed lockers for private use.

That complete immunity to ivy poisoning is rare? L. W. Kephart of the U.S.D.A. says, "Ivy poisoning is caused by a waxy or gummy substance present in most parts of the poison ivy plant even after long drying. Direct contact with this substance is necessary for poisoning to take place, but contact need not necessarily be with the plant itself, since poisoning may occur by touching clothing, tools, dogs, horses, or other objects which have been in contact with poison ivy. Many persons believe themselves immune to ivy poisoning, but complete immunity is rare. Severe poisoning frequently occurs after many years of freedom from the disease, although the circumstances causing this change are unknown."

That an excellent series of articles on Rodent Control by Robert M. Borg is now appearing in the American Fruit Grower? A heavy mouse population, amounting in one orchard to 94 per acre, threatens severe damage in Mass. orchards. Now is the time to do something about it. To obtain the recommended material, zinc phosphide, and directions for its use, consult your county agricultural agent.

That the term, "ready to bear" fruit trees is a misnomer? Any nursery advertising such nursery stock is deceiving the prospective buyer by inducing him to believe that certain nursery trees, usually sold at a high price, will bear a good crop the first year after planting. Any experienced fruit grower knows that it takes considerable time for a fruit tree to become established and that any fruit borne the first or second year is likely to be borne at the expense of vegetative growth. The apple or two borne the first season is less significant than the bushel or two which it may bear at 8 years of age.

## THE TIME FACTOR IN FRUIT GROWING

Through the centuries poets and philosophers have stressed the importance of grasping opportunities as they pass instead of lamenting their loss afterwards. "There is a tide in the affairs of men which, taken at the flood, leads on to fortune - -". "Strike while the iron is hot." "Time and tide wait for no man." Nowhere is the truth of this philosophy better illustrated than in the fruit business. The fruit grower cannot do in November what he should have done in October. A few illustrations may be in order. Mouse bait must be applied before the mice have turned from a diet of grass to a diet of bark. If curculio are most active on May 30 it doesn't do much good to apply a first cover spray on June 2. A hormone spray will be infinitely more effective if applied a day before the McIntosh crop shows a heavy drop than a few days later. We have all seen farmers who get around to start haying operations in mid-July while a thrifty neighbor has his haying completed by July 1. As we look forward to a busy 1944 we may well keep a calendar and so far as possible do today those tasks which should not be put off until tomorrow.

## THE FRUIT SITUATION AS RELATED TO 1944 FOOD PRODUCTION GOALS

At a Food Production Conference held in Amherst October 13 and 14, attended by representatives of all interested farm agencies and organizations, Massachusetts goals in each commodity were carefully considered. The Fruit Committee submitted the following report:

### Apple Production in Massachusetts

The apple crop in 1942 amounted to 3,400,000 bushels. In 1943, it amounted to 2,552,000 bushels while the 1934-1941 average amounted to 2,484,000 bushels. In 1944 we may reasonably expect a crop somewhat larger than in 1943 although not as large as the record crop of 1942. The 1944 crop may total approximately 2 3/4 million bushels. This estimated increase over 1943 will be due in part to a larger prospective McIntosh crop and to the fact that next year is the "on year" for the Baldwin variety in many orchards.

Unlike most vegetables, and to a certain extent, eggs, apple production cannot be greatly increased over a period of a year or two, even under the best orchard practices. The number of fruit buds which may develop into apples in 1944 was determined several months ago. Weather conditions at blossoming time and also the amount of nitrogen available to the tree will be important factors in the actual set of fruit. The apple grower can, of course, greatly influence the percentage of apples which develop to maturity since he has at least partial control over insects and diseases. He can also influence the number of bushels to some extent as he increases the size of individual fruits through fertilization and mulching.

The goal of the Massachusetts apple grower in 1944 will be to produce maximum yields on present plantings. To do this will not require saving every tree in the state regardless of age, height or degree of crowding. In many orchards high production of marketable fruit will be greatly favored by removing filler trees. In many cases this will involve cutting out every other diagonal row. In older orchards where the trees are too tall to be sprayed and harvested efficiently the tops should be lowered by pruning. Since labor is such an important item in apple production our orchards should be put in order. This is an ideal time to lay plans for more efficient spraying and easier harvesting in 1944.

### Needs of Massachusetts Fruit Growers

Equipment. Difficulties in controlling apple scab in 1943 emphasize the need for both spraying and dusting equipment. Every fruit grower must of necessity have a good sprayer. Any grower with 20 acres or more should also have a good duster. Since dusting can be done with less time than spraying, and since it provides needed protection at critical times, dusting should be considered as a necessary supplement to spraying, particularly in our larger orchards. We will need 100 percent as many dusters as were delivered in 1940. We will also need at least 80 percent as many sprayers as were delivered in 1940. Sprayer and duster repair parts must be made available. Growers report that repair parts were very slow in being delivered last season. A good supply of all needed parts must be made available for prompt delivery, including

scarce metal parts such as stainless steel balls, aluminum heads for spray brooms, etc. Wherever such parts are needed a strong claim should be made by the interested grower. A considerable quantity of rubber hose will also be needed for replacement on our older sprayers. All of these items should be ordered early. Early placing of orders will undoubtedly influence the number to be delivered and will also insure having the equipment in working order at critical times.

Spray and Dust Materials. Supplies of all needed insecticides and fungicides for 1944 appear to be adequate, although manpower will be a critical factor in their manufacture. Distribution may be a factor. This emphasizes the need for getting orders in early. Standard materials including lead arsenate and sulphur are not likely to be more restricted than in 1943. Not enough pyrethrum was available last year for use on cranberry bogs. In view of this fact, more pyrethrum should be made available in 1944.

Fertilizers. If our orchards are to produce to the limit of their capacity we must have enough nitrogen to maintain good tree vigor and to develop the 1944 crop. Certain forms of nitrogen, particularly ammonium nitrate, will apparently be available in quantity. Arrangements must be made to release enough nitrogenous fertilizers at the right season to supply our orchard needs. Fall application of nitrogen is not recommended. There is danger of winter injury at this latitude from such treatment. Farther south that danger does not exist. For this reason our growers must have an adequate supply of nitrogen for early spring application. Where sufficient nitrogen for a broadcast application is not available, a ring application is recommended. The wider use of nitrogen in impoverished orchards will help to attain the fruit production goal in 1944.

The supply of phosphorus will apparently be ample for orchard needs. Potash will be scarce, although this will not greatly handicap our growers since Massachusetts orchards, in general, are well supplied with potash. Most growers can well afford to release potash supplies for other uses. A liberal potash application tends to encourage magnesium deficiency. Symptoms of magnesium deficiency are now very prevalent in many orchards. The general use of high magnesium, or dolomitic limestone, is therefore recommended. Liming of orchards can best be accomplished through the AAA Program. Dolomitic lime in bulk shipment, spread by means of an end gate spreader, will constitute a valuable addition to the orchard fertilizer program. Mulching is also strongly recommended.

Marketing. No particular problem can be foreseen at present,

Packages. More wooden boxes will be needed in 1944 than in 1943 on account of the larger prospective McIntosh crop. Containers made from substitute materials are entirely unsuited for storage use since they do not hold up under the high humidity conditions existing in a storage. High priorities should be given to wooden containers for all fruits including apple boxes, cranberry boxes, strawberry crates, peach basketc, etc. Delivery of apple boxes should be made before July 1.

Transportation. Since fruits are highly perishable, and during peak seasons the fruit grower is dependent upon truck transportation, trucking

facilities must not be reduced in 1944.

Storage. In view of a somewhat larger crop in 1944 more storage space will be needed than was available during the past two years. To prevent the waste which occurred in 1942, amounting in some localities to 10% of the crop, adequate storage facilities for the 1944 crop are imperative.

Labor. Fruit growers will benefit greatly by the arrangements now being worked out which will permit experienced workers to transfer to another essential industry during the off season and later return to the fruit farm when needed. Labor requirements, except during the harvest season, should present no more of a problem than in 1943. Harvest labor needs are likely to be greater in 1944 because of the larger prospective McIntosh crop. These needs should be thoroughly surveyed during the summer. Consideration should also be given to the discovery and training of crew bosses in advance of the harvest season. Our experience in recruiting and placing harvest labor in 1943 will prove valuable in 1944 when labor conditions are likely to be more difficult than they were this season. Many growers have expressed their appreciation of the efforts of Labor Coordinators, Extension Service workers, newspapers, etc. in helping to solve the harvest labor problem.

Ladders and Picking Baskets. These items were scarce in some localities in 1943 and plentiful in others. In order to accommodate larger numbers of pickers on weekends and other ruch periods fruit growers must provide themselves with extra ladders and containers. Early orders and wider distribution of these items will facilitate the 1944 harvest.

Credit. Present farm credit facilities are adequate.

Price Supports and Ceilings. In view of the fact that present ceiling prices are established at levels lower than those at which apples were moving freely, support prices not far below the present ceilings are recommended. A satisfactory price will provide an effective incentive for maximum production in 1944.

## CEILING PRICES ON FRESH APPLES

Following is an abstract of a statement on this subject, prepared by Ellsworth W. Bell:

Ceiling prices on sales of fresh apples have been established by Amendment 9 to MPR 426, effective October 7, 1943. This order covers any and all apples for TABLE USE except the Lady variety and crabapples. Apples for processing are not covered by this order and, in the opinion of the Regional Office of the OPA, establishes one price for table apples of all kinds, varieties and packs, whether loose-packed, wrapped in individual wrappers, gift wrapped, or in any other form.

For apples sold by growers and delivered to retailers, insitutional users such as hotels, restaurants, schools, etc., government procurement agencies and other persons, except to ultimate consumers and intermediate sellers, the prices in Table 1 will apply for less than carlot sale (L.C.L.)* and less

than trucklot sale (L.T.L.)* For such sales by growers, delivered to intermediate sellers (persons who buy for resale to retailers, institutional users and other persons except ultimate consumers), the prices in Table 2 will apply.

For sales of carlot (C.L.)* or trucklot (T.L.)* quantities of apples produced in and sold in New England, delivered at any terminal market or wholesale receiving point (except C.L. or T.L. shipments by C.L. distributors or brokers), the prices in Table 1 and 2 less 1¢ per pound shall apply, depending upon the type of receiver. For example, the grower's ceiling price will be figured as follows:

(1) Growers making C.L. or T.L. sales, delivered to a retailer, uses Table 1 price schedules less 1¢ per pound. In other words, under Table 1, a C.L. or T.L. sale of 40-pound containers will be 40¢ lower than the $2.85 price quoted for similar containers in October.

(2) Growers making L.C.L. or L.T.L. sales, delivered to a retailer, uses the ceiling prices indicated in Table 1.

(3) Growers making C.L. or T.L. sales, delivered to an intermediate seller, uses prices indicated in Table 2, less 1¢ per pound.

(4) A grower making L.C.L. or L.T.L. sales, delivered to an intermediate seller, uses the prices indicated in Table 2.

For a grower making a C.L. or T.L. sale not delivered at any terminal market or wholesale receiving point, for example at his farm, there appear to be no pricing provisions in the language of this order. The price ceilings prevailing in this type of selling (f.o.b. farm), is being worked out and announcements will be made later.

For sales by growers to the ultimate consumer, the schedule of prices in Table 3 will apply. These prices apply to Zone 1 which covers all of the North Atlantic states, all of the East-North-Central states, with the exception of certain counties in Michigan and Wisconsin, and all of the South Atlantic states with the exception of Georgia and Florida. These ceiling prices cover all types of sales by growers, made by parcel post or express, as covered in the footnote under Table 3.

*A carlot sale (C.L.) or a trucklot sale (T.L.) means a quantity of fresh apples transported in one car or truck or other conveyance at one time out of which 75% or more by weight is sold to one person. The sale of the remaining quantity to another person may be considered a less than carlot sale (L.C.L.) or less than trucklot sale (L.T.L.). For example, if a truckload of 100 bushels of apples is sold to one person, the sale would be considered a trucklot and would take the ceiling price for such a quantity. If 80 bushels were sold to one person and 20 bushels to another person, 80 bushels would be considered a trucklot sale and the remaining 20 bushels would be considered a less than trucklot sale. On the other hand, if 70 bushels or less than 75% were sold to one person, and the remaining 30 bushels to another person, the entire load, according to the order would be a less than trucklot sale. A 75% figure would apply to any quantity of apples sold, whether 50 bushels or 500 bushels, if transported in one car or truck.

# Ceiling Prices for Fresh Apples in Massachusetts (Zone 1) According to Amendment 9 to MPR 426
(Effective October 7, 1943)

Table I. Ceiling prices for L.C.L. and L.T.L. sales, delivered basis, to retailers, institutional users (hotels, restaurants, schools, etc.) government purchasers and any other person except ultimate consumers and intermediate sellers.

| Month | Dollars per container for specified container sizes (Minimum net weight of fruit) | | | | | | | | | | | | | | | | Dollars per pound of fruit for all containers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 35 lbs. | 36 lbs. | 37 lbs. | 38 lbs. | 39 lbs. | 40 lbs. | 41 lbs. | 42 lbs. | 43 lbs. | 44 lbs. | 45 lbs. | 46 lbs. | 47 lbs. | 48 lbs. | 49 lbs. | 50 lbs. | |
| Oct. | 2.49 | 2.56 | 2.64 | 2.71 | 2.78 | 2.85 | 2.92 | 2.99 | 3.06 | 3.14 | 3.21 | 3.28 | 3.35 | 3.42 | 3.49 | 3.56 | 0.07 1/8 |
| Nov. | 2.62 | 2.70 | 2.78 | 2.85 | 2.92 | 3.00 | 3.08 | 3.15 | 3.22 | 3.30 | 3.38 | 3.45 | 3.52 | 3.60 | 3.68 | 3.75 | .07 1/2 |
| Dec. & Jan. | 2.76 | 2.84 | 2.91 | 2.99 | 3.07 | 3.15 | 3.23 | 3.31 | 3.39 | 3.46 | 3.54 | 3.62 | 3.70 | 3.78 | 3.86 | 3.94 | .07 7/8 |
| Feb. & Mar. | 2.89 | 2.97 | 3.05 | 3.14 | 3.22 | 3.30 | 3.38 | 3.46 | 3.55 | 3.63 | 3.71 | 3.80 | 3.88 | 3.96 | 3.04 | 4.12 | .08 1/4 |
| Apr., May, June | 3.02 | 3.10 | 3.19 | 3.28 | 3.36 | 3.45 | 3.54 | 3.62 | 3.71 | 3.80 | 3.88 | 3.97 | 4.05 | 4.14 | 4.23 | 4.31 | .08 5/8 |

Table II. Ceiling Prices for L.C.L. and L.T.L. sales, delivered basis, to intermediate sellers (for resale to retailers, institutional users and other persons except ultimate consumers), and for sales in an auction market. (Zone 1)

| Month | Dollars per container for specified container sizes (Minimum net weight of fruit) | | | | | | | | | | | | | | | | Dollars per pound of fruit for all containers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 35 lbs. | 36 lbs. | 37 lbs. | 38 lbs. | 39 lbs. | 40 lbs. | 41 lbs. | 42 lbs. | 43 lbs. | 44 lbs. | 45 lbs. | 46 lbs. | 47 lbs. | 48 lbs. | 49 lbs. | 50 lbs. | |
| Oct. | 2.32 | 2.38 | 2.45 | 2.52 | 2.58 | 2.65 | 2.72 | 2.78 | 2.85 | 2.92 | 2.98 | 3.05 | 3.11 | 3.18 | 3.25 | 3.31 | .06 5/8 |
| Nov. | 2.45 | 2.52 | 2.59 | 2.66 | 2.73 | 2.80 | 2.87 | 2.94 | 3.01 | 3.08 | 3.15 | 3.22 | 3.29 | 3.36 | 3.43 | 3.50 | .07 |
| Dec. & Jan. | 2.58 | 2.66 | 2.73 | 2.80 | 2.88 | 2.95 | 3.02 | 3.10 | 3.17 | 3.24 | 3.32 | 3.39 | 3.47 | 3.54 | 3.61 | 3.69 | .07 3/8 |
| Feb. & Mar. | 2.71 | 2.79 | 2.87 | 2.94 | 3.02 | 3.10 | 3.18 | 3.26 | 3.33 | 3.41 | 3.49 | 3.56 | 3.64 | 3.72 | 3.80 | 3.88 | .07 3/4 |
| Apr., May, June | 2.84 | 2.92 | 3.01 | 3.09 | 3.17 | 3.25 | 3.33 | 3.41 | 3.49 | 3.58 | 3.66 | 3.74 | 3.82 | 3.90 | 3.98 | 4.06 | .08 1/8 |

Table III. Ceiling Prices for sales by growers to ultimate consumers in Massachusetts (Zone 1)

| Month | Zone I Cents per pound |
|---|---|
| Oct. | 9 1/2 |
| Nov. | 10 |
| Dec. & Jan. | 10 1/2 |
| Feb. & Mar. | 11 |
| Apr., May, & June | 11 1/2 |

Footnotes to Table III

These ceiling prices cover all types of sales by growers to ultimate consumers including, e.g. all sales of gift packages by express or mail, fancy holiday packages, etc.

Where community prices for apples sold at retail are established by district or regional offices of the OPA, the maximum prices stated above shall not apply.

# Fruit Notes

November 23, 1943

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## GOOD ADVICE ON APPLE MARKETING

The following statement comes from John Chandler, Sterling apple grower and Executive Secretary of the National Apple Institute: "At the risk of being called visionary, your Secretary wishes to make a suggestions which he believes will prove practical in the long run.

The combination of a very short apple crop, a greatly accelerated demand, and the preclusion by the apple price ceilings of realizing higher prices for fine packs is tending to discourage careful grading and packing. At the same time, the definite and substantial periodic mark-ups in the ceiling regulations are tempting growers to withhold their apples until the last possible moment. Unfortunately both of these practices are working against the years of work which all of us have put into building a greater demand for apples. If there are periods during which the housewife cannot buy apples at all, and if, when she can get them, they are not of the quality, size or condition she wants, her thoughts will turn to other foods and we will have crossed a good customer from our list. By the same token, the store manager, the distributor and all those who depend on regular supplies of apples will lose their interest in our product in some degree.

Would it not be better if we all undertake to supply our usual trade with a normal supply of properly packed apples? This will mean some financial sacrifice. Yes. But let us remember that we are experiencing an extraordinary year, in which most of us can earn a fair profit, even if we pack and sell in the

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

normal way, and particularly let us remember that other years are coming, years of large yields when, regardless of ceilings and mark-ups, none but the best will command the maximum price and when we will be obliged to sell when the market can absorb our apples regardless of mark-ups. Then we will need our outlets, our customers and their good will. What was that parable about the goose that laid the golden egg?"

## WINTER INJURY TO GRAPE VINES

That grape varieties differ widely in their relative susceptibility to severe winter tempera tures is shown by the results of an examination of the College vineyard last spring combined with a study of yields this fall.

During the winter of 1942-43 there were two periods in Amherst when the minimum temperature was abnormally low. The first of these periods came on December 20 and 21 when the minimum temperature on both dates was 15 degrees below zero. The second period came on February 15 and 16 when the minimum temperature was 19 below and 23 below, respectively. While some injury may have occurred in December, the greater portion of it probably occurred in February. From the following observations on the relative amount of injury it will be noted that Concord, Worden and Fredonia withstood the low temperatures remarkably well.

Agawam - Practically dead.
Athens - Vine 50% injured.
Brighton - Vine 50% injured; also remaining blossom buds injured.
Brockton - Canes all injured; trunk O.K.
Bronx - Trunk dead.
Buffalo - On one vine, 25% of canes injured; on other vine, trunk dead.
Catawba - 75% injured.
Concord - Practically no injury.
Davenport Seedling (blue) - Blossom buds 50% killed.
Davenport Seedling (green) - 25% of vine injured.
Delaware - 75% of buds injured. Practically no injury to vines.
Dunkirk - 10% of vine injured.
Eden - Trunk dead.
Fredonia - 10% injured.
Hanover - Trunk dead.
Hector - One trunk dead; other vine, 25% of canes injured.
Iona and Keuka - Trunks dead.
Lindley - 60% of vine injured.
Merrimac - 50% of vine injured.
Muscat Hamburg - 85% of vine injured (other pure Viniferas - trunks dead).
Niagara - 90% of buds injured; practically no injury to vines.
Ontario - 10% of canes injured.
Ruby - Trunk dead within one foot of ground.
Salem - 50% of vine injured.
Seneca and Urbana - Trunks dead.
Wayne - 60% of vine injured.
Wilder - 50% of vine injured.
Worden - Practica lly no injury.
Yates - One trunk killed nearly to ground; trunk of other vine O.K. but some cane injury.

---O. C. Roberts

# Do You Know:

That the number of jars of fruits and vegetables preserved in Massachusetts last season is estimated at 61,000,000? The total value is about $9,764,000 or 900,000,000 ration points.

That peach and apricot pits may be transformed into charcoal which is very satisfactory for use in gas masks? Extensive tests of this material have recently been made in Oregon.

That the Delicious apple is probably the most important variety in the United States? This variety occupies more acres than any other and is more widely distributed. Its commanding position is due in part to high quality and to the publicity it has received.

That the total business of the 900 fruit and vegetable cooperatives in the United States last year amounted to 325,000,000 dollars? This year's total tonnage, packed largely for military and lend-lease purposes, will be much larger.

That the yield of pecans from wild or seedling trees in the United States exceeds that from trees of improved varieties? More than 56,000,000 pounds of pecans were harvested from the wild or seedling trees last year while less than 48,000,000 pounds were harvested from trees of improved varieties.

That approximately 2,000,000 bushels of Fancy or higher grade apples in Washington and Oregon have been ordered set aside by the WFA to meet the requirements of the armed services for fresh apples? The regulations require all persons who own (on or after November 6) 500 bushels or more of apples grown and located in either of the two states, which meet the respective state standards for Fancy or higher grades, to set aside 15 percent of each variety of these apples for purchase by the armed services or any other governmental agency specified in the order.

That British scientists working on the fruits of the Rugosa Rose, which is used in that country as a hedge plant, have found it to be even higher in Vitamin C than oranges? As a result they are using it to make marmalades and vitamin concentrates to fortify the lack of these elements in wartime diets.

---A. M. Davis

That the Floweringquince, sometimes called Mexican Firebush, and more commonly referred to as Cydonia japonica (now correctly Chaenomeles japonica), produces occasional fruits which are not altogether satisfactory for flavoring, but will make a good jelly? A mixture of the fruits of the Japanese Quince, so-called, and either our native apples or some other fruit such as some of the flowering crabapple fruits, produces a delicately flavored and delightfully colored jelly.

---A. M. Davis

## MOVIE FILMS AVAILABLE AT MASSACHUSETTS STATE COLLEGE

Movie films on a wide variety of subjects may be obtained through E. S. Carpenter, Secretary of the Extension Service, M.S.C., Amherst, Mass., for showing to interested groups anywhere in Massachusetts. These films are both educational and entertaining. Any group interested in the loan of one of these films may communicate directly with Mr. Carpenter. Following are brief outlines covering two films which have recently been deposited at the State College for general distribution:

Guardians of Plenty - colored - sound - 1 reel - 800 feet. This film is both entertaining and informative for any audience, but especially for anyone interested in growing gardens or any commercial crop where pest control is involved. It shows what goes on in an up-to-date research laboratory during the development and critical testing of new fungicides and insecticides as well as the demonstration of the effectiveness of old, standard materials. The close-up color views of such pests as the house fly, the fruit codling moth, aphids, Japanese beetle, are interesting and even fascinating in most instances. It demonstrates very convincingly how important is a spreader or sticker when added to an arsenical spray for codling moth control. It leaves no question in the mind of the audience regarding the scientific training and experience, as well as the technical, accurate equipment that are back of the discovery and testing of fungicides and insecticides that are eventually placed on the market for use in pest control. Available December 1, 1943 to June 30, 1944. Made by Du Pont.

Soldiers of the Soil - black and white - sound - 1 reel - 1350 feet - running time 40 minutes. Put out by Du Pont but advertising not objectionable. A dramatic movie illustrating the importance of agricultural production in the war effort. The story is built around a young man who is on the home farm with his father and a brother who has lost his eyesight in the war returns. The young farmer decides to enlist in the Marines because he feels he is not doing his part to help win the war. The blind young man speaks at the Sunday service in the Village Church not on his experiences in the war, but on the importance of maintaining agricultural production on the home front. The deferred brother finally decides to stay at home and maintain production. Made by Agricultural Extension Division of Du Pont.

## REPORT ON THE BOYSENBERRY

Two replies have been received in response to our request for information about the boysenberry, in October Fruit Notes. Report No. 1 (from New Hampshire): "We have had boysenberries for several years, and under our conditions have found that practically all the canes winter-kill every year. The only ones that live through are those which are naturally covered by leaves or rubbish, which sometimes happens because they lie so close to the ground. We think that they are a terrible nuisance to take care of, and the production on the canes that live through the winter has not been overabundant. Taken all in all, I consider they have no commercial value and very little value even as a home fruit. They should be classed as a novelty. This applies equally to Nectarberry, Thornless Boysenberry, and Thornless Youngberry. Of the whole lot, Boysenberry is probably the best."

Report No. 2, "My attempt winterkilled. Berry when ripe is like a skin full of water. Color bronze, yield light, but flavor fairly good. It may be different elsewhere and have some home garden possibilities."

CORRECTING MAGNESIUM DEFICIENCY

The use of magnesium sulfate spray applications on magnesium deficient apple trees at Massachusetts State College this past season has shown that this method may be a practical and effective treatment. Four special sprays were applied to young trees in an orchard showing considerable foliage scorch and leaf fall in 1941 and 1942. Applications were made at approximately pink, calyx, first and second cover. The sprays contained 16 pounds of Epsom salts per 100 gallons of water and were applied as special applications. Incidentally, it is probably safe (although we have no definite data) to add the Epsom salts to the regular spray mixture thus largely eliminating any extra application cost for the magnesium. Compared with the check or unsprayed trees, those sprayed showed much less foliage scorch this fall. Of the 146 sprayed trees, 65% showed no deficiency symptoms, compared to only 20% for the same number of unsprayed trees. Beneficial effects of magnesium spray applications have also been reported from New York and Maine.

Soil applications of magnesium compounds have likewise shown promising results at Amherst. Both Seawater Magnesia and Epsom salts applied at the rate of 5 pounds per small tree in the fall of 1942 were beneficial in reducing scorch prevalence and severity in 1943. These results are not in line with experience elsewhere, where benefits have not been apparent for some years following soil treatments. However, the trees at Amherst are young (just beginning to fruit) and are growing under a heavy mulch system of culture. It is probable that both of these factors have a favorable influence on the intake of magnesium from compounds applied to the soil. Tests in an older orchard gave no indication of benefit from the soil applications.

In orchards showing serious magnesium deficiency, the application of magnesium in sprays seems to be a logical procedure. For instance, with trees requiring 20 gallons of spray for adequate coverage, 12.8 pounds of Epsom salts would be provided per tree in the 4 applications described above. Thus, in addition to the immediate corrective effect of a foliage application, the amount of magnesium applied (and most of it gets to the ground sooner or later) is equal to or even greater than that in the suggested soil treatment.

Further experimental work is planned, but in the meantime growers should be doing something to correct serious magnesium deficiency conditions. Where soils are very acid (and many orchard soils are), magnesium limestone should be applied and worked in, if possible.

---Lawrence Southwick

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WANTED - APPLES OF OLD VARIETIES. An exhibit of apple varieties which were common 50 years ago will be staged at the 50th Anniversary of the M.F.G.A. to be celebrated at Horticultural Hall in Worcester, January 5 and 6. If you have a dozen specimens of one or more interesting old varieties available for this exhibit, please communicate with S. Lothrop Davenport, chairman of the exhibit committee, North Grafton, Mass. Among the varieties needed are these: Hubbardston, Porter, Blue Pearmain, Mother, Black Gilliflower, Ben Davis, etc.

QUESTIONS AND ANSWERS ON APPLE PRICE CEILINGS

The following Questions and Answers were released October 29 by the Office of Price Administration for the guidance of the trade in pricing apples sold for home consumption under Amendment No. 9 to Maximum Price Regulation No. 426 (Fresh Fruits and Vegetables for Table Use, Except at Retail) which went into effect early in October. (Key words in each Question are underscored.)

1. Q. To what point does the first ceiling on shipments of apples apply within a state?
   A. The first ceiling which applies to intra-state shipments is the carlot or less-than-carlot ceiling price in any terminal market or other wholesale receiving point.

2. Q. Is it permissible to price loose apples by the bushel or packed by the box?
   A. No. Apples must be sold on a minimum net weight basis. Under some circumstances, apples may be sold by the bushel or in any other container, loose or packed, if the minimum net weight of the fruit is marked on the container, and the price charged is not more than the applicable ceiling price for that weight.

3. Q. Suppose a grower sells a trucklot of apples to a retailer making delivery in his own truck, would he then be entitled to the maximum price for sales to retailers?
   A. No. He is entitled to the maximum trucklot price for sales to retailers which is the same price as the maximum trucklot price to any other kind of purchaser. There is a carlot or trucklot ceiling price for every market, which is always the same price within the particular market for sales to any kind of purchaser.

4. Q. Under what circumstances can a grower or shipper perform the functions of an intermediate seller and obtain the allowances therefor?
   A. The only circumstances under which a grower or shipper may obtain part or all of the intermediate seller's markup occur when he sells less-than-carlot or less-than-trucklot quantities delivered to a retailer or to an intermediate seller.

5. Q. If a person buys from three or four different growers and makes up carlots, is he entitled to the carlot distribution markup?
   A. No. In order to qualify as a carlot distributor a person must buy unbroken carlots and resell unbroken carlots.

6. Q. If a grower consigns apples to a commission merchant who sells in less-than-carlots to retailers is the grower entitled to the proceeds after deducting transportation charges and commission?
   A. Yes, but the grower selling through a commission merchant establishes his ceiling price by taking the carlot delivered price in the market or other wholesaler receiving point plus the usual commission of the commission merchant. The ceiling price is not permitted to exceed the applicable less-than-carlot price to retailers or to wholesalers. If a commission merchant sells in carlots, the price is the carlot market ceiling price.

7. Q. If a grower sells a half-car of apples through a broker to each of two wholesalers or jobbers, what ceiling price applies?
   A. The ceiling price is the less-than-carload ceiling price for sales to intermediate sellers.

8. Q. Is it permissible for the grower to add a brokerage charge to the f.o.b. ceiling price, when making an f.o.b. shipping point sale?
   A. No. Brokerage may only be added when a carlot is sold delivered by a broker in the terminal market or other wholesale receiving point.

9. Q. May a shipper or grower qualify as a carlot distributor?
   A. No. Original shippers are specifically excluded from taking a carlot distributor's markup.

10. Q. May a chain store share with the original shipper in any of its markup out of the consumer retail price?
    A. No.

11. Q. What is the maximum price a grower or grower's sales agent can quote to a chain store organization?
    A. If the grower or his agent is selling f.o.b. shipping point in one of the states listed, Idaho, New York, Oregon, Pennsylvania, Virginia, Washington and West Virginia, the grower's ceiling is the f.o.b. price listed. If the grower or his agent is selling carlots delivered in the market, the ceiling is the applicable less-than-carlot ceiling price to retailers less one cent per pound. If the grower is located in a state having f.o.b. ceilings, the ceiling for a delivered carlot sale is the f.o.b. price plus freight to the market or other wholesale receiving point. If the grower or his agent is selling less-than-carlot to an intermediate seller, delivered in the market, his ceiling price is the applicable less-than-carlot price. If the grower is selling less-than-carlot to a chain retailer, delivered to the premises from which the retailer resells to consumers, the price is the less-than-carlot ceiling price for sales to retailers.

12. Q. Can a grower legally make an additional charge for boxes or other containers?
    A. No, nor may a seller accept any deposit for any reason, whether he is trading in containers or lending the money to the buyer.

13. Q. What price ceiling applies for sales to the Army or Navy?
    A. If the sale to the Army or Navy is in carlots or trucklots, the ceiling price is the same as the carlot or trucklot ceiling price to any other carlot or trucklot buyer. If the sale to the Army or Navy is in less-than-carlot or less-than-trucklot quantities, the ceiling price is the applicable less-than-carlot or less-than-trucklot price for sales to retailers.

14. Q. Is a seller permitted to "roll a car unsold" in October for a market arrival and sa le in November?
    A. Yes. If delivery (see question and answer 36) is made in November the November ceiling price applies.

15. Q. Are freight subsidies a part of the apple price ceiling program?
    A. Yes. Freight subsidies on western apples shipped into eastern zones have been undertaken by the War Food Administration.

16. Q. May the agent of a seller in his terminal market selling through an auction return to the grower any amount of excess of the commission or charge of the agent?
    A. There is a specific ceiling price for sales at auction. The seller may receive the proceeds of the auction sale less all auction charges, less the agent's usual commission and less any other charges.

17. Q. Do the maximum prices to retailers and intermediate sellers apply on apples grown and shipped from Michigan or other states not covered by f.o.b. ceilings?
A. Yes.

18. Q. Do the maximum prices covering sales in an auction market apply to purchases by an ultimate consumer in an auction market?
A. Yes.

19. Q. Is there any allowance made for grower's sales agents?
A. Growers' sales agents obtain their maximum prices if they are making sales f.o.b. shipping point.

20. Q. Can a subsidiary of a chain organization purchasing unbroken carlots legally add the carlot distribution markup when reselling unbroken cars?
A. Yes.

21. Q. Has any consideration been given to price differentials for grades and varieties of apples to be made by regional or district offices of the OPA?
A. The regional and district offices of the OPA have the authority to establish community ceiling prices at the wholesale and retail levels, but amendment 9 was not intended to provide a basis for the making of varietal and size differentials.

22. Q. In cases where it has been the custom to add cartage for out-of-town deliveries to retailers or institutions, is it permissible to add such charges to the maximum prices?
A. No. The uniform zone prices established in amendment 9 include normal delivery charges to the place where the retailer or institutional buyer is located. However, consideration is being given to provide higher less-than-carlot prices for delivery to retailers or institutions located substantial distances from primary receiving points where carlots or trucklots can be received.

23. Q. Define a commission merchant.
A. A commission merchant is an agent of a grower or shipper, located in the terminal market or other wholesale receiving point, who sells in less-than-carlot or less-than-trucklot quantities to wholesalers, retailers or institutions, who usually sells through a store and extends credit and who remits to the grower or shipper the net proceeds of a sale deducting therefrom his commission and all other applicable charges.

24. Q. A grower takes a trucklot of apples to Cumberland, Maryland, and sells in less-than-trucklot quantities to retailers. Does he determine his maximum price by reference to the table covering sales to retailers?
A. Yes.

25. Q. A grower does not have time to go to Cumberland, Maryland and visit each store to make sales, but he is in a position to sell in lcl quantities by phone to the retailers. He loads his truck and sends it to a central point where the apples are picked up by the buyers. He finds that sales of this kind are considered pool trucks. Why is there a difference in the ceiling price for this method of sale as compared to less-than-carlot sales to retailers?

A. Because the expenses involved in making this kind of a sale are considerably less than if the grower himself performs the function of selling delivered to the premises of the retailer. If the grower after having taken his phone orders, delivers individually to each retail buyer he takes the less-than-carlot price to retailers.

26. Q. Does a grower or shipper have the option of selling delivered to a market or f.o.b. shipping point in order to obtain the highest possible legal return?

A. Yes, but the grower or shipper will not obtain a higher return on any but an intra-state shipment (see question and answer 34).

27. Q. In selling to truckers who come into the producer's area covered by the f.o.b. ceiling price, is the grower allowed to sell at a price higher than the net f.o.b. ceiling price?

A. No.

28. Q. In selling the consumer a few baskets of apples, may the grower take the ceilings on sales to consumers or does he have to make physical delivery?

A. Delivery is not necessary. The grower in this case takes the ceiling for sales to consumers.

29. Q. If a shipper sells direct to a jobber is the shipper entitled to the brokerage or carlot distributor allowance?

A. No.

30. Q. Where a shipment is made from a point within a state covered by f.o.b. ceilings to another point within the same state, but crosses another state's lines en route, is such sale an intra-state sale and therefore not subject to the f.o.b. ceiling price?

A. Such a sale is an intra-state sale since the point of ultimate delivery controls the price to be charged.

31. Q. Suppose a seller does not wish to weigh each box. May he take a representative sample?

A. Any sampling runs the risk that the boxes will weigh less than the legal minimum weight. If a seller "guesses wrong" as to the weight, he is in violation.

32. Q. May a carlot distributor invoicing buyers include brokerage providing brokerage is paid by the carlot distributor?

A. No. The maximum price for sales by carlot distributors is the price set forth in paragraph (c) (2) of amendment 9 and no further addition may be made. In any one transaction, both the carlot distributor's markup and brokerage charge cannot be taken. These allowances are mutually exclusive.

33. Q. What is the ceiling price for export sales of apples?

A. Export sales of apples may be made at prices which are composed of the domestic ceiling prices per pound, plus certain premiums for packing, plus freight. The Second Revised Export Price Regulation covers export sales of all commodities covered by domestic ceiling price regulations.

34. Q. When the terminal market price is greater than the f.o.b. shipping point price plus freight, protective services and other charges from the states having f.o.b. ceilings, does the higher terminal market price become the maximum price?

A. The delivered price in carlots or trucklots for any interstate shipments of apples from any one of the states having f.o.b. ceilings, is the f.o.b. ceiling price plus freight to the market or other wholesale receiving point. The carlot delivered price computed by subtracting 1 cent per pound from the less-than-carlot or less-than-trucklot price to retailers applies only to intra-state shipments in states having f.o.b. ceilings and to both inter-state and intra-state shipments of apples from states having no f.o.b. ceilings.

35. Q. A carlot or trucklot of apples is placed in terminal cold storage by a grower under an arrangement that delivery to a retailer is to be made from time to time in less-than-carlot quantities, with the grower paying cartage to the retail store. Would the maximum price to retailers for the appropriate month and zone be the ceiling price for such transactions?

A. Yes, provided that sales of this type are made to retailers in less-than-carlot quantities.

36. Q. What constitutes "delivery" for the purposes of establishing a maximum price?

A. There are four tests to be applied for the purposes of determining when title passes to the buyer and delivery has taken place. (1) If at any time delivery has been made to a carrier not owned or controlled by the seller, "delivery" has taken place. (2) If at any time actual physical delivery has been made to the buyer, "delivery" has taken place. (3) If at any time the particular lot being sold has been car marked or completely segregated for the account of the buyer, "delivery" has taken place. (4) If at any time there has been legal agreement between the buyer and the seller to the effect that title shall pass to the buyer upon actual physical receipt of the goods, then delivery takes place when the buyer physically receives the goods. In other words on a "delivered sale" if the buyer and the seller agree that title shall remain in the seller until such buyer physically receives the goods, "delivery" has not taken place until the buyer actually receives the goods.

37. Q. Can a shipper, cooperative or grower's sales agent offer less-than-carlot quantities of apples through brokers at auction?

A. Such sellers may legally sell at auction. The ceiling price is the same as the ceiling price for sales to intermediate sellers. Auction fees and brokerage must come out of (not be added to) the ceiling price for less-than-carlot sales to intermediate sellers.

38. Q. If decay exists in a package of apples, may the fruit be invoiced at the weight marked on the package, or must an allowance be made on the invoice covering the amount of decay?

A. The apples in this package must be sold on the basis of their per pound ceiling price, derived from the net weight marked on the package, without regard to the condition or quality of the fruit.

# Fruit Notes

December 30, 1943

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## TO PLANT OR NOT TO PLANT PEACHES

This past season peaches were a "golden harvest." Six to nine dollars a bushel makes a few acres of peaches look like a gold mine. But looks can be deceiving. So if you're planning to plant peaches, let's consider a few facts and what they mean.

The 1941 crop was 37% below the 1942 crop and 24% below the ten year (1932-41) average. With the exception of Michigan, Pennsylvania, and New Jersey, which had fair crops, the crop in the eastern half of the United

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

States was very short. The New England crop was a total failure. It is unusual for so many of the eatern peach sections to have crop failures in the same year.

According to the 1940 United States Census, there were in the United States in 1939 47.1 million peach trees of bearing age and 21.7 million not of bearing age. Assuming that 1/3 as many trees not of bearing age as those of bearing age are required for normal replacements, there is an excess of 6 million young trees. In another 4 or 5 years, these should be at the peak of their production. This indicates a considerable increase in peach production with its consequent influence on price just as trees planted in 1944 are coming into bearing.

Therefore, prices in 1943 were far above normal because of unusual circumstances. Normal prices will tend to decline due to increased production of young trees already planted and coming into bearing.

However, the picture for the commercial grower in Massachusetts is good if he uses his knowledge and skill to best advantage. The number of peach trees in Massachusetts, both bearing and nonbearing, is the lowest in many years. Locally grown peaches have always found a ready market at satisfactory prices. However, six or seven dollars a bushel cannot be expected from locally grown peaches if the national crop is large.

On the other hand, the novice better follow the time honored advice to "make haste slowly." Just consider a few of the difficulties:

1. The orchard site is very important. Massachusetts is on about the northern limit of peach growing. Unless the peach orchard is well situated, frequent winterkilling of buds will make the orchard unprofitable, and killing of the trees may ruin it. All too frequently crops are lost even in favorably situated orchards.
2. Variety selection is important. A beautiful picture and glowing words guarantee nothing.
3. Among the insects and diseases to be controlled are the following serious ones:
    a. The oriental fruit moth, which is the chief cause of wormy peaches, has been in Massachusetts for many years. No adequate control has been worked out for this pest.
    b. The peach tree borer is a serious pest. A single borer can ruin a young tree before it reaches bearing age.
    c. The yellow-red virosis (X-disease) has come into Massachusetts recently. This virus disease can be controlled by eliminating all chokecherries in the vicinity of the peach orchard, but this is no small job.
    d. The plum curculio, which also makes peaches wormy, is sometimes controlled with arsenate of lead. However, peaches are very susceptible to injury by the arsenic in this material.
4. Peach orchards, except very small ones, require mechanical equipment for their care. Under war conditions this equipment is high priced and hard to get.
5. It costs money to bring an orchard into bearing. A crop failure or two at the wrong time may turn that gold mine into a millstone.

The experienced peach grower knows where to locate his orchard as regards site and soil. He knows varieties and what to look for in a new one. He has the equipment and knows how to use it. But most important of all, he has the "know how" for growing and handling peaches. The novice who has all this to learn had better "stop, look, and listen" to make sure that he gets onto the train and not onto the track.

-- J. S. Bailey

## CONTROL OF PEACH TREE BORERS

Dr. Oliver I. Snapp, the originator of the eythylene dichloride treatment for the control of peach tree borers, has been looking for something more safe and equally effective. He reported recently that propylene dichloride, even when 1/4 to 1/3 less is used, is as effective as ethylene dichloride and much safer. However, his experiments have not progressed to the point where he is recommending propylene dichloride for general use.

-- J. S. Bailey

## DANGER IN HEAVY EARLY WINTER PRUNING

An apple grower told at a recent meeting that he had started to do a very drastic job of lowering the trees in an excessively tall orchard. Some of the trees had been slashed back to about half their former height. Words of caution from others at the meeting about heavy pruning before midwinter will probably set him thinking. The following is quoted from the October issue of "Food for Victory with King Apple," (University of Illinois):

"Experience in Illinois indicates that fall and winter pruning of apple and peach trees may result in serious tree-killing when the pruning is followed by sub-zero temperatures. During the winter of 1935-36 a 30-acre block of peach trees pruned from December to February was killed to the ground by a Feburary sub-zero cold wave. The rest of the orchard, which was unpruned, was killed back to a height of about six feet. During the severe winter of 1929-30 a block of Wealthy and Duchess trees in the University orchard at Urbana, which had been pruned before the cold wave, was so heavily damaged that more than half the trees eventually died. The heavier the pruning, the greater is the hazard. Pruning wounds heal better when cuts are made in the spring. If it becomes necessary to prune during the winter because of labor shortage, it is suggested that stubs about a foot long be left on all cuts more than 2 inches in diameter. These stubs may then be cut off in early spring when the danger of sub-zero temperature is past. This will enable the branch to be taken out of the orchard during the winter."

Similar observations were made in Massachusetts after the severe winter of 1933-34. There is apparently much less danger from fall and early winter removal of weak, drooping branches or parts of branches, than from heavy cutting of vigorous branches.

In a recent release to Connecticut growers under the heading, "Tall Trees are Expensive," H. A. Rollins says, "If you cannot reach the tops of your apple trees with a 20-foot ladder it is time to lower the tops by pruning, so that you can spray, thin and pick the apples more easily next year.

Growers are finding it very expensive to produce apples on the tall trees and almost impossible to get them picked with inexperienced labor. Some growers, in recent years, have lowered the tops of their tall trees by rather drastic pruning. Others are planning to do something about it this winter. To avoid winter injury, large cuts should be made in late winter after the danger of extremely low temperatures has passed. Unless cuts are made so that the main limbs will be partially shaded, sunscald on the tops of the branches may cause serious injury. If the tops are pruned heavily, the rest of the tree should have only a light pruning. Plan your pruning program now before you forget how difficult it was to pick those apples from tall trees."

LIST OF SUBJECTS DISCUSSED IN FRUIT NOTES DURING 1943 - Page No. in ()



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A sign in a Connecticut Valley retail store window carries this message: FANCY U. S. NO. 1 SELECTED MACINTOSH APPLES. The only things wrong with this statement are (1) if the apples are U. S. No. 1 they can't be Fancy, (2) if of either grade they would naturally be Selected, (3) the apples appear to be ungraded, and (4) the Variety name is misspelled. (The printing, at least, is good).

# Do You Know:

That the Common Barberry (Berberis vulgaris L.) is one of the first plants brought over by the early English settlers for the purpose of providing a fruit from which jellies and jam could be made? This plant with its sour fruit makes an interestingly flavored jelly. Since its early introduction it has spread because of birds eating the berries and thus disseminating the seeds, until now it is found all over our pasture hillsides in the Northeast. This plant is frequently used as an ornamental in gardens, and in the fall of the year the sprays are much used in decorative arrangements. Of interest to fruit growers, however, is the fact that it was originally introduced from Europe for its fruit. It has always been interesting to me that in a land which abounds with native fruits, the early settlers, because they did not know these fruits, made an effort to introduce some from the region with which they were familiar. Of the native fruits three are outstanding, - the blueberry, cranberry, and native strawberry, all of which soon offered stiff competition to a plant which was introduced for its jelly possibilities. -- A. M. Davis

That history records the finding of cranberries on Cape Cod as early as 1602? In 1638 an English naturalist visited this section and in making a record of New England "rarities" mentions "cranberries" which he stated "The Indians and English use much, boyling them with sugar for sauce, to eat with their meat".

That the use of magnesium as a soil treatment may become as common in some sections of the U. S. as the use of calcium, nitrogen, phosphorus and potassium? An application of one of the magnesium compounds appears to be very much needed on some Massachusetts farms.

That ground limestone obtained under the AAA program may be applied to crop land, pasture, poultry ranges or commercial orchards? Ground limestone may be secured by farmers up to a tonnage not exceeding that determined by the total of the units on the farm, divided by 5, figured to the nearest ton on the basis of farmyard delivery. If lime is taken at the railroad siding, 20% more material may be added. If taken at the lime manufacturing plant, another 20% is added.

That ceiling prices will probably be established on all fresh fruits during 1944? OPA is planning to bring under control, well in advance of next season's crops, all the remaining fresh fruits including sweet cherries, apricots, peaches, pears and plums.

That certain gift packages of apples are exempt from price control regulations? The provisions of an OPA release dated November 25, are as follows: "Apple growers and shippers who package their apples in boxes with a net weight of not more than 26 pounds, with not more than 5 boxes sold at one time to one buyer, shipped by Express or parcels post, are not under price control with respect to such sales."

That a recent amendment to the apple ceiling order increases the ceiling in so-called secondary or rural markets? Under this amendment the ceiling on apples delivered in less than carlots or less than trucklot quantities to secondary markets at a distance of 25 miles or more from primary markets is 18¢ per box higher than the primary market ceiling. This increase of 18¢ in ceiling price of apples delivered into these secondary markets will, it is hoped, result in a more equitable distribution of current limited supplies.

SPRAY MATERIALS FOR 1944 MUST BE ORDERED AND STOCKED EARLY

One of the most important questions that confronts the farmer and victory gardener right now is looking out for his supply of fungicides and insecticides for 1944. It is equally essential that retailers estimate their needs of these materials for the coming year, get their orders in and actually stock up on those supplies at the earliest possible moment. If these matters are not attended to promptly, many of us are likely to find it impossible next summer to obtain the right kinds of dusting and spraying materials at the time they are most needed.

In the past season, supplies of copper fungicides, mercury and nicotine dusts were short in many localities at the time they were needed to combat such pests as cucumber and potato blights, cabbage maggot and plant lice on potatoes, tomatoes and a number of other vegetables and fruits. The officials of both the Agricultural Insecticide and Fungicide Association, a nation-wide organization of manufacturers and distributors, and the War Food Administration warn us in no uncertain terms that the situation is likely to be even worse in 1944 due to increasing shortages of labor or manpower at manufacturing and distributing points, and to the critical container situation and the limitations in transportation facilities.

While the present outlook for fungicide and insecticide supplies is fairly good for 1944 as regards allocation of raw materials for their manufacture, yet the Agricultural Insecticide and Fungicide Association issues the warning that, "Most important of all, the distributors, dealers and consumers all must place their orders and take their deliveries earlier than ever before--to beat those manpower, container and shipping deficiencies. This applies particularly to copper compounds." The War Food Administration recently sent out the following telegram directed to people over all the country: "War Food Administration urges farmers to help make the 1943-44 distribution of insecticides and fungicides fully effective by placing orders now and requesting early delivery. . . Because of transportation, labor and shortage difficulties it is necessary to keep insecticides and fungicides moving if manufacturers are to meet farmers' needs. . . Manufacturers have been taking in raw materials for next season production since September 1st and the finished insecticides are now building up in storage. . . Farmers accepting insecticides and fungicides now should have no difficulty in storing them on their farms in a dry, floored, weather-proof building. . . Unless farmers cooperate with War Food Administration by accepting supplies early we may encounter serious problems."

For the benefit of all concerned, it is hoped that farmers and gardeners, as well as retailers, throughout Massachusetts heed these requests and warnings, and place their orders for and stock up with fungicides and insecticides just as early this fall as possible.

-- O. C. Boyd

# Pomological Paragraphs

## ABSORPTION OF NITROGEN THROUGH APPLE LEAVES

All well-informed fruit growers know that their trees obtain mineral nutrients, including nitrogen, from the soil. Some people have been very skeptical of the ability of leaves to absorb mineral nutrients, but it is now well established that they may do so. However, it is unlikely that the spray outfit will replace the fertilizer distributor. One difficulty is that soluble minerals, as nitrate of soda, applied in a spray are likely to burn the leaves. The Geneva Experiment Station has shown that Uramon (urea) applied in the regular pesticide sprays, 5 lbs. per 100 gallons, with lime, did not burn McIntosh leaves but resulted in a typical nitrogen color response and increased the nitrogen content of the leaves. These trees were obviously deficient in nitrogen. When applied to trees well supplied with nitrogen, there was little or no response. It is suggested that this method of supplying nitrogen may offer means of a more exact control of the nitrogen supply of the tree. (Proc. Amer. Soc. for Hort. Sci. Vol. 43: p. 123.)

-- J. K. Shaw

## POTASH AND MAGNESIUM DEFICIENCIES

Many Massachusetts fruit growers know Dr. A. B. Burrell and also Dr. Damon Boynton who formerly managed an orchard in Amherst. They have been studying potash deficiency in apple trees in the Champlain Valley. They dug in 3 pounds of sulfate of potash in a narrow band under the tips of the branches in successive years. In the second year, leaf scorch was strikingly reduced and in the third year was almost eliminated and shoot growth was increased. In the fourth year, potassium leaf scorch disappeared, shoot growth about doubled and the potash content of the leaves also doubled. But there appeared a "fertilizer injury" to the leaves; the writer is willing to bet a cigar that it was due to magnesium deficiency. On other trees, a 1% solution of sulfate of potash applied 6 times as a spray, and sulfate or muriate dug in or applies on the surface all increased the potash content of the leaves and also increased growth. No increase in yield is reported. Potash deficiency seems more prevalent in the Champlain Valley than in other parts of New York. (Proc. Amer. Soc. Hort. Sci. Vol. 43, page 61.)

-- J. K. Shaw

## POTASH CONTENT OF APPLE LEAVES

It has been found by Baker in Indiana that the application of potash to culvivated orchards did not consistently increase the potash content of apple leaves over those from trees not fertilized with potash. However, when trees were mulched with straw or tobacco and even with paper, sawdust, or glass wool, the potash content of the leaves was consistently higher than that of leaves from trees not mulched. This is interesting as it suggests that not all the greater available potash under a mulch comes from the mulching material; there must be an effect of the mulch on the potash of the soil. (Proc. Amer. Soc. for Hort. Sci. Vol. 43: p. 7).

-- J. K. Shaw

SOME EFFECTS OF MULCHING

Many Massachusetts fruit growershave mulched their orchards with good results. Wander and Gourley in Ohio have tried to find out the reason for the favorable results of mulching. They compared the soil under mulch and under cultivation and found that the available potash was much greater under mulch even to a depth of 21 inches. The increase of magnesium and calcium was less, although that of organic matter, phosphorus and boron, while large in the surface 3 inches, was small or showed no increase at greater depths. The acidity of the soil was not affected. The potassium and phosphorus content of both leaves and fruit was increased by mulching, while the content of both magnesium and calcium was decreased in the leaves. No comment is made on nitrogen, but it is always evident that mulched trees have plenty of nitrogen. This confirms the belief of the writer that the beneficial effects of mulching are largely due to increased available nutrients. (Proc. Amer. Soc. for Hort. Sci. Vol. 43: p. 1)

-- J. K. Shaw

SECTIONAL MEETING OF A.S.H.S.

Most fruit growers know of the American Society for Horticultural Science, which is the national organization of the "scientific" horticulturists. This Society omitted its annual meeting last year and will do so this year. Instead, group meetings will be held in different sections, thus avoiding the congestion resulting from war time travel. The New England members will meet in Worcester on January 4, 1944. While this meeting will be devoted to discussion of Horticultural Science, any fruit growers who care to attend will be welcome.

-- J. K. Shaw

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The national apple crop in 1943 was 31% below that of 1942 and 28% below the 1934-41 average. California was the only major state with a larger crop in 1943 than in 1942. In Washington unfavorable spring weather in 1943 reduced the crop about 15% below that of 1942.

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In checking on a worthless crop of apples a few days ago the writer was told that the orchard received three "pink" sprays. Further inquiry brought this explanation;- "three applications of that pink stuff, lead arsenate".

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A number of instructive and entertaining movies are available at the State College for general distribution. Among the recent ones are: "Farm Work is War Work," "War Time Nutrition," and "Out of the Frying Pan into the Firing Line."

WHT:VA

# Fruit Notes

PROF. JOHN S. BAILEY,
FRENCH HALL,

January 31, 1944 11 43

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## RELATIVE IMPORTANCE OF APPLE VARIETIES IN THE U. S.

The McIntosh variety is now one of the three most important varieties in the U.S. With a production of 9,249,000 bushels in 1943 and 13,609,000 bushels in 1942, it accounted for between 10 and 11 per cent of the total apple production in the country. It is the most important variety in the Northeastern and North Central States, particularly New England, New York, and Michigan. In other sections of the country, except for Montana, where the bulk of the apple production is McIntosh, this variety is of minor importance. In 1943 and 1942 more than half of all apples grown in New England and almost a third of all New York apples were of this variety.

The volume of several other common varieties grown in the United States in 1943 and the percentage of the national crop are as follows; Delicious,

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14,180,000 bu.(about 16%. Two-fifths of the Delicious apples in the U.S. are produced in Washington) Golden Delicious, 2,358.000 bu. (a little less than 3%). Rome Beauty, 5,597,000 bu. (6.4%). Stayman, 3,683,000 bu. (4.2%). Winesap, 9,869,000 bu. (about 11%). Yellow Newtown, 3,898,000 bu. (4.4%). York Imperial, 4,250,000 bu. (5%). Jonathan, 6,854,000 bu. (about 8%). Grimes Golden, 1,560,000 bu. (about 2%). Baldwin, 2,637,000 bu. (about 3%). Wealthy, 2,336,000 bu. (2.7%).

## MID-WINTER TASKS ON THE FRUIT FARM

Overhauling the sprayer and other fruit farm equipment should take first place among mid-winter tasks. If the sprayer has not yet been put in the best possible condition it should be overhauled at once and all worn parts replaced.

Ordering supplies, including fertilizers, spray materials, and boxes, is another job which should not be delayed. Even though boxes are not needed for another six or eight months, there is urgent need for locating new boxes, box shooks, or used boxes this winter and spring. Boxes are certain to be scarcer than in 1943. Among the ingenious methods being used by some growers are: getting out the logs and hauling them to the mill to insure a supply of raw material, and in one case furnishing several workers for a short handed box shop. There will undoubtedly be more buying of box shooks and nailing at the farm than in years past.

A third item of utmost importance at this season has to do with "streamlining the orchard"for more efficient spraying and harvesting. Crowded trees are being removed on a wholesale scale in a number of orchards. In a recent meeting of 40 fruit growers in Worcester this question was asked, "How many are either removing fillers or are planning to remove fillers before next spring?" Eleven of the 40 raised their hands. Pruning at the ground level or lifting the trees out, stumps and all, by means of a bulldozer, is a most effective way to reduce the cost of production without materially reducing the actual yield. Within two years a crowded orchard from which half the trees are removed will be back to its former production with a considerably lowered production cost. Washington State College specialists say that the costs for growing and harvesting apples in central Washington decline rapidly as yields increase from less than 200 boxes per acre to 350 boxes an acre. Getting rid of the extra trees in an orchard is a big factor in increasing the yield of salable fruit.

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James F. Gallant of the Essex County Agricultural School, Hathorne, Mass. informs us that a graduate of the School, now employed as a farm manager on an estate, is available this spring for employment in orcharding, vegetable gardening, or general farming. He is primarily interested in horticulture and is well qualified to serve as an orchard manager.

In 1917 there were only about 50,000 tractors on farms. Today there are nearly 2,000,000.

# Pomological Paragraphs

## WATER IN THE SOIL

In early spring or following a period of heavy rainfall, the space between the particles in the soil may be nearly or quite filled with water. Part of this water drains away by gravity and is good riddance, for fruit trees will not grow in a water-logged soil. Air in the soil is necessary if tree roots are to grow and function properly, and air and water cannot occupy the same space. After drainage has removed what water it can, much still remains. The trees draw upon this water until it is so far exhausted that the leaves wilt, and if not watered, the trees soon die. Considerable study has been made to learn if this available water is all of equal value to the trees, and whether the trees suffer before the water falls to the wilting point.

Experimenters at the Washington State Experiment Station studied this problem by measuring the carbon dioxide intake of the leaves under various amounts of available water in the soil. This is a good measure of the growth of tree and fruit. They found that the trees worked efficiently until the water dropped to within 3% of the wilting point. This suggests that a drought period will not harm the trees if it is not too severe and prolonged. When the leaves begin to wilt, and do not entirely recover over night, the tree is in a bad way. If they wilt during a hot dry afternoon, it means that water is getting scarce and it is time to pray for rain or do something else about it. (Proc. Amer. Soc. for Hort. Sci. 42; page 133.)

--J. K. Shaw

## INTAKE OF NITROGEN DURING WINTER

Experiments conducted by Batjer, Magness, and Regeimbal of the U.S.D.A. show that young apple trees may take nitrate and ammonium nitrogen into the roots under winter conditions, but that the nitrogen does not move upward in the tree during the dormant season. The roots were subjected to a temperature of 38-40° and the tops to 45-60°. At 45-60°, the roots absorbed no more nitrogen than at the lower temperature. The fact that apple roots take in nitrogen at relatively low temperatures suggests one reason why fall applications of a nitrogenous fertilizer meet with favor in the more southern apple areas. In New England, there is evidence that fall applications may cause winter injury to the trees. (Proc. Amer. Soc. for Hort. Sci., Vol. 42, p. 69. 1943).

--J. K. Shaw

## ANOTHER KIND OF DWARF APPLE TREE

Dwarf apple trees are produced by budding the desired varieties on dwarfing stocks which are small, slow growing kinds of the common apple. Different stocks produce trees ranging from very dwarf (6-8 feet tall) to nearly full-sized trees. By budding or grafting a very dwarfing stock onto

a seedling stock and then budding this to the desired variety, we may expect a partially dwarfed tree; or in other words, a tree having a seedling root and a McIntosh top, with a section of wood of a very dwarfing stock in between. We may briefly describe such a tree as "McIntosh/ Malling IX/ French Crab Seedling." Such a tree should not be confused with a McIntosh on Malling IX which would be a very dwarf tree. It would be more like a McIntosh on Malling I or II. (Proc. Amer. Soc. for Hort. Sci. 42, page 357.)

--J. K. Shaw

## MANGANESE AND COPPER DEFICIENCIES

It has been shown that deficiencies of Boron and Magnesium sometimes occur in apple trees in Massachusetts. In the area bordering the Gulf of Mexico and locally in California, deficiencies of other elements have been found. Perhaps similar deficiencies may appear here. In the Gulf region cultivation of the tung tree is developing rapidly. Oil from tung nuts finds many uses in industry, particularly as a drying oil for paint. It has been found that tung trees sometimes suffer from a lack of Manganese and of Copper. Symptoms of Manganese deficiency are a "frenching" or chlorosis of the leaves, with small dead areas and premature dropping of some of the leaves. It is cured by applications of manganese sulfate. Ammonium sulfate is beneficial as it increases soil acidity and releases Manganese which is fixed in the soil by too little acidity.

Copper deficiency is indicated by small "cupped" terminal leaves, chlorosis, and dying and dropping of the leaves. Axillary shoot growth is stimulated and shoot tips die. Application of a weak copper sulfate, either to the soil or as a spray, corrects this condition. (Proc. Amer. Soc. for Hort. Sci. 42, pages 74 and 79.)

--J. K. Shaw

## THE YELLOW-RED VIROSIS

The "X-disease" of peaches is now acquiring a real name. It will be known as the Yellow-Red Virosis, because it turns peach leaves yellow and chokecherry leaves red. It was discovered in Connecticut in 1933. It had doubtless been present there and probably in Massachusetts before that time. It was discovered in the Hudson Valley in 1938 and is now pretty well spread over the northern part of the peach country. A recent bulletin of the Geneva Experiment Station reports the results of a study of the disease in that state. It is caused by a virus which is "an exceedingly minute infective principle..... not visible under the highest magnification of the microscope." The chokecherry is very susceptible, and the virus is supposed to be carried to the peach by some insect whose identity has not yet been discovered. It may pass from peach tree to peach tree, but less rapidly. It may also be transmitted by buds from diseased trees. Chokecherry bushes must not be allowed to grow within 500 feet of a peach orchard. Sodium chlorate and ammonium sulfamate were the only materials found satisfactory for killing chokecherries. No peach variety escaped the disease when inoculated with virus-infected tissue but possibly some varieties are less susceptible than others. The common black cherry does not carry the disease. (N.Y. State Agr. Expt. Sta. Bul. 704.)

--J. K. Shaw

SEEN AND HEARD IN MAINE

Having been loaned to the State of Maine for two weeks (Jan. 9-23), the writer takes this opportunity to report a few of his observations. The trip involved seven well attended fruit meetings, three county agent conferences and numerous visits with individual growers. Newspaper accounts of heavy snowstorms this winter are not exaggerated. Snow plows, in some towns, have been taxed to the limit and many of them are laid up for repairs. Some telephone lines are down, and certain orchards are so deeply buried that mid-winter mouse control measures are out of the question.

Hardy Stocks. Cold winters have caused so much damage to apple trees in Maine in years past that there is real interest in establishing orchards on one of the hardy stocks. The severity of Maine winters is shown by the fact that Baldwin trees on ordinary seedling stock will survive only two or three years in the vicinity of Orono. But if grafted in the branches of a Hibernal or Virginia Crab tree even the tender Baldwin will survive for many years. The method of establishing an orchard on a hardy stock is briefly this: An ordinary seedling whip is budded to Virginia Crab or Hibernal in the nursery and after growing a year or two is transplanted to the orchard and developed as a leader type tree. Wide angled branches develop naturally on these varieties. When the framework is well established the branches and "leader" are either budded or whip grafted to the desired variety, the buds or scions being placed on the branches as far out as 18 inches from the trunk. The resulting tree is thus a three-story affair, having a seedling root, Hibernal or Virginia Crab trunk and main branches, and a top of the desired variety. This kind of tree looks especially promising since much of the winter injury in ordinary trees occurs in the trunk and crotches. A nursery pool under the supervision of State Horticulturist Stanley L. Painter, makes it easier for growers to obtain these custom made trees.

Leaf Scorch (Magnesium Deficiency). As in Massachusetts, leaf scorch (caused by magnesium deficiency) presents a real problem in some Maine orchards. The leaf symptoms include yellowing between the veins, and later, a dropping of the older leaves on the terminal growth. Tests have been conducted in a Maine orchard for a number of years, using a wide variety of materials. Where potash was used, leaf scorch was more apparent than before. Within the last two or three years the effectiveness of magnesium sulfate (Epsom Salts) has been clearly demonstrated. At present, three spray applications, using 20 lbs. in 100 gals., are recommended in magnesium deficient orchards, the first around Calyx period and the other two at ten-day intervals.

Northern Spy and Golden Delicious. Certain orchard locations seem very well adapted to the growing of Northern Spies. At the fruit meetings in Buckfield and Wilton large Spies of unusually good color and quality (from the Conant and Weeks orchards) were distributed. On the basis of these samples it appears that this old variety is very much at home in the Pine Tree State. The Golden Delicious varies widely in different orchards. From the Wallingford orchard in Auburn we saw some exceptionally fine Golden Delicious. These apples were the result of a good soil and good management, including thinning. In other orchards this variety is small in size and of mediocre quality, due in part, perhaps, to a lack of thinning.

Orchard Crowding. While the snowwas too deep to walk through any of the orchards, the problem of crowding appears to be as widespread as it is in Massachusetts. Many of the orchards have just about reached the age where something must be done about it. Maine growers seem as much inclined as we to delay the removal of fillers "one more year." At most of the meetings this point was brought out: When a grower finds the branches brushing the sprayer as he drives through, he should begin a drastic cutting back of the temporary trees, or the trees in every other diagonal row. When this practice no longer allows ample space for efficient spraying, the temporary trees should be removed entirely. And if the removal of filler trees is already overdue, as is so evident in many New England orchards, the sooner we remove every other diagonal row, the better. A bulldozer is an ideal tool for this purpose.

Apple Scab Control. In general, Maine growers seem to have an easier time in controlling scab than we have in Massachusetts. An exception to this rule is found in counties near the coast where trees seem to dry off less readily after a rain. Growers farther inland and at higher elevations find it possible to control scab, in some seasons, with only two or three sprays. One grower is actually reported to have qualified for the 90% Clean Apple Club on a crop which received only two sprays. There is considerable interest in dusting both for the control of scab and apple insects. One insect, known as the mealy bug is causing considerable damage in Maine orchards. Thus far, our Massachusetts growers have not had to worry about this particular pest.

Deep Snow Favors Mice. There is some cause for worry about possible mouse damage under the snow in some of the Maine orchards. Two very heavy snowstorms have completely covered all mouse runs, thus preventing growers from doing effective mid-winter baiting. Unfortunately, quite a number of orchards had not been baited when the first heavy snow came in November. As the snow thaws, growers are advised to pack it down around the trunks of trees as one means of checking mouse damage.

## "A GOOD PRODUCT IS ITS BEST ADVERTISEMENT"

In a release from the National Apple Institute under this heading John Chandler, Executive Secretary, says in part, ". . , Of recent years, the economic factor has worked against good apples doing their own advertising. Back in the twenties, when apple prices returned a good living to growers and when there were no ceilings, the better packs of apples resulted in handsome returns to the growers for the extra expense incurred. Consequently apples were their own best advertisement. Unfortunately, during the dark decade of the thirties when most consumers were buying the cheapest food available, the premium for fine packs practically disappeared. During the last twelve years only enough grading and packing has been done to move the apples. Many good Eastern packs disappeared entirely. Although growers far from market maintained the high standards which paid out during the twenties, this was done to retain an outlet for their apples rather than with any hope of commensurate returns, since they were often obliged to accept prices disastrous to them.

"So I feel that the long depression, rather than the attitude of apple growers has been responsible for so many poor apples appearing in the markets with the consequent falling off of demand and the further depression of prices. By the same token most apple growers have had their pride in, and enthusiasm for, quality packs pretty well atrophied over a period of many years, during which better packs have meant only added expense. Since the present economic outlook indicates the possibility of profitable years ahead for apple growers, now is the time to stress placing attractive apples before the public as the best possible advertisement for our products. Good packs of apples, plus the promotional machinery brought into existence through the depression years, should restore apple production to a sound and profitable business."

## THE SIGNIFICANCE OF SOIL ACIDITY IN THE ORCHARD

For many years farmers have considered the various fruit crops as being either very tolerant of acidity or as actually preferring a strongly acid soil. An occasional orchard is found growing on a soil which is much too acid for the growth of clover and other legumes. But we should not lose sight of the fact that cover crops in general have a shallower root system than apple trees and are therefore influenced to a greater extent by the acidity and availability of mineral elements in the surface layer. Our Massachusetts soils are generally more acid in the surface soil than they are in the subsoil. This is due to at least four causes. (1) Crop removal tends to take from the soil calcium, magnesium and other basic materials. (2) Leaching tends to carry these basic materials into the subsoil or they may be removed in the drainage water. (3) Erosion carries some of these materials to lower levels. (4) Heavy applications of sulfur have greatly acidified some of our orchard soils. This latter factor alone has actually made the soil beneath some of our trees so acid that nothing but moss will grow at the present time. All flowering plants, including the various grasses, have been completely excluded because of the acidifying action of sulfur. Under these conditions, one may wonder how an apple tree can continue to live, to say nothing about producing crops of fruit. This mystery is explained by the fact that the roots of an apple tree under good growing conditions range deeply into the subsoil and also far beyond the spread of the branches where soil conditions may be much more favorable.

There is a definite relationship between the availability of the various mineral elements needed by a growing plant and the acidity of the soil. If the soil is too acid nitrifying bacteria become inactive and as a result the decomposition of organic matter becomes so slow as to affect the supply of nitrates. Furthermore, if the soil is either too acid or too alkaline phosphorus is believed to be locked up in unavailable forms. We may therefore think of lime as a soil conditioner. As we bring about the desired degree of acidity we create conditions which favor the availability of minerals needed for plant growth. In addition, the lime which we apply contains calcium and magnesium both of which are essential in plant development.

Every fruit grower should determine the acidity of the soil in his various blocks to determine whether or not lime is needed, and if so, how much

should be applied. Unless the soil is obviously very acid we ought not to apply lime without first making a soil test. In grandfather's day, folks took sulfur and molasses in the spring on the assumption that it would do no harm and it might do some good. Some folks lime the soil on the same basis, a little now and then as a matter of insurance.

In the absence of a soil test, much can be learned about the need for lime by studying the natural growth of weeds, grasses, etc. If orchard grass grows waist high, we needn't worry about soil acidity. And if clovers thrive, there is reason to believe that conditions are reasonably favorable for the trees. But if the cover crop consists of a discouraged growth of cinquefoil, sorrel, dewberries, poverty grass, and certain sedges, there is every reason to believe that the soil is very acid. Ordinary grasses fail to grow before these miscellaneous acid tolerant plants occupy the soil. An occasional application of lime is of great benefit in maintaining a good cover crop which exerts an indirect effect upon the tree. The continued use of sulfur in the control of apple scab has more or less completely changed the type of cover crop in many of our orchards. This is to be expected since 500 pounds of sulfur mixed with the surface six inches on an acre of fine, sandy loam tends to lower the acidity rating by about one-half a pH unit. In other words, a soil rating pH 6 might actually become pH 5.5 after applying a quarter of a ton of sulfur per acre. It is interesting to note that many of our best orchards are on soils ranging between 5.5 and 6.5.

One other factor in connection with soil acidity should also be considered. Magnesium deficiency is becoming a serious problem, particularly in eastern Massachusetts. Many such orchards are on Gloucester or Merrimac soils which are naturally low in magnesium. Such soils are also inclined to be strongly acid. As a matter of good orchard management, soils of this kind should be limed, using a high magnesium or dolomitic limestone. This will accomplish two purposes. It will tend to condition the soil by reducing acidity, and it may ultimately supply some of the magnesium now lacking in the soil. But if the deficiency is severe, a more readily available form of magnesium, such as magnesium sulphate or epsom salts, should also be applied. An application of high magnesium limestone seems to be long overdue on the average fruit farm. In view of the fact that 50 years may have elapsed since some of our fields received an application of lime, the 50th Anniversary of the Massachusetts Fruit Growers' Association is an appropriate time to satisfy a long felt need.

To clear up any misunderstanding concerning the relation of the pH numbers to actual soil acidity the following figures are presented: 7 represents a neutral soil; 6.5 slightly acid; 6.0 moderately acid; 5.5 medium acid; 5.0 strongly acid; 4.5 very strongly acid; and 4.0 extremely acid. A soil which rates pH 4 is ten times as acid as one which rates 5, and one hundred times as acid as one which rates 6. Practically all of our Massachusetts soils fall within the range of pH 4.5 to pH 6.5.

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Evolution of the apple box: Bin - Barrel - Basket - Box.
Perhaps the Bag deserves a place in this scheme of things.

# Fruit Notes

February 29, 1944

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## PEACH MOTH PARASITES

Because of the war emergency it will not be possible to conduct the Oriental Fruit Moth parasite rearing project this season. Not only is the labor shortage very acute, but transportation conditions are such that no assurance could be given us that breeding material would not be delayed in transit. Any prolonged delay en route would endanger the life of the insects. An effort will be made to secure a very limited number of parasites by direct purchase from Connecticut, provided there is any surplus in that state,

--A. I. Bourne

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Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United Sta tes Department of Agriculture, and County Extension Services cooperating.

## A SPRAYING RECORD

Hoosier Horticulture, issued monthly by the Indiana Horticultural Society, reports that Mr. Glen Jones of Mt. Sterling, Illinois personally applied 268,000 gallons of spray material on his orchard in 1943. His only assistant was the tractor driver . He used a sprayer with a 400 gallon tank and did all the spraying from a tower.

--L. Southwick

## HEARD IN MAINE

At the annual meeting of the Maine Pomological Society the question came up concerning what variety to plant to prolong the McIntosh season. Many Maine growers are interested in a hardy winter apple to take the place of the once widely planted Baldwin. Some hardy varieties produced in the Middle West and some unnamed seedlings from the breeding work in Maine and elsewhere may find a place. But one of the most interesting comments to come out of the discussion was made by County Agent Lovejoy who operates a sizeable orchard venture of his own. He argued that instead of seeking a brand new variety for the late market, Maine growers should first test extensively a variety that has already proven itself. This variety is Golden Delicious. Mr. Lovejoy contends, on the basis of his own experience, that the Golden Delicious can be grown successfully and profitably in Maine. Furthermore, a man who has marketed many Maine apples in New York was present and he stated that Maine grown Golden Delicious have topped the New York market. He felt strongly that the market can absorb a greatly expanded production of well-grown Golden Delicious apples and urged that growers who have the right soil and growing conditions might well increase their plantings of this variety.

--L. Southwick

## APPLE AND PEAR UTILIZATION

The Crop Reporting Board of the U.S.D.A., Bureau of Agricultural Economics, reports that during the period 1934 to 1942 about two-thirds of the country's commercial apple crop was sold as fresh fruit. Considering the 1942 crop, 78,246,000 bushels were sold as fresh fruit; 6,541,000 bushels were used in farm households; and 35,102,000 bushels were manufactured into products as follows: canned apples - 11,426,000 bushels; dried apples - 7,376,000 bushels; vinegar, cider, apple juice and other products - 16,300,000 bushels.

New York, Pennsylvania and Washington are the most important states in the canning of apples, accounting for 57 percent of the apples canned in 1942. About 90 percent of the nation's production of dried apples comes from California, Washington, and New York. The three leading states in the manufacture of vinegar, cider and apple juice are New York, Pennsylvania and Virginia.

Of the 1942 pear crop, 15,584,000 bushels were sold for fresh use; 10,797,000 bushels were canned; 3,244,000 bushels went for farm household use; and 627,000 bushels were dried.

--L Southwick

# Do You Know That:

That a new insecticide, known as DDT, is found to be extremely and instantaneously toxic to many insects? This material, the full name of which is dichloro-diphenyl-tri-chloroethane, was first synthesized 70 years ago by a German chemist. It was not until 1939, however, that it was patented by a Swiss firm as an insecticide. DDT is very toxic against flies, mosquitoes, bedbugs, and body lice, and in powder form may be dusted on human skin without harm. One application of the powder to the walls of a room makes the room a death chamber for flies for three months. At present the entire output of this new material is being used by the Army. Looking ahead, one can foresee a new era of insect control in the orchards of America.

That the designation "Malling," applied to dwarf apple trees, is derived from the East Malling Research Station in England, where the more common root stock materials for the apple were freed from mixtures, standardized and designated by number as Malling 1, Malling 2, etc.? Most of these dwarfing stocks are relatively old, as plants go, although their standardization and introduction by number has taken place within the last few years,

That several of the so-called "Malling" stocks have been known for many years under various names, including Doucin and English Paradise? Malling 1, for example, was known as Broad Leaf English Paradise, Malling 2 as English Paradise, Malling 4 as Dutch Doucin, Malling 5 as Improved Doucin, etc. Malling 9 was selected as a chance seedling in France about 1879.

That a sodium salt of dinitro-cresol at concentrations of .1 to .2%, applied at blossoming time, offers considerable promise as a means of reducing the set of fruit on certain biennial bearing varieties? This material will destroy a blossom that has been open for only a few hours but does not seem to prevent fruit setting if a blossom has been open for a day or more. Thus it is possible by proper timing of the spray to destroy 5 of the 6 blossoms on the spur. It is a well known fact that the center flower tends to open a day or so before the lateral flowers. Since this practice is still in the experimental stage, it is recommended that trials be limited to certain varieties, including Transparent, Early McIntosh, Duchess, and Wealthy, in which the results have been quite gratifying.

That more than 10 million bushels of pears were canned in the United States in 1942? Pear production in the United States varies less from year to year than apple production. The yield of pears in the United States, during the nine years from 1934 to 1942, varied from 25,943,000 bushels in 1935 to 31,704,000 bushels in 1938.

That the supply of nitrogenous fertilizers available to farmers this season will be about 35% greater than in any previous year? There will, therefore, be more nitrogen in mixed fertilizers and for direct application as top and side dressings. This increased supply will be equivalent to about 850,000 tons of ammonium sulfate. Ammonium nitrate is at the present time, and may continue to be, a low cost source of nitrogen for direct application. More than 200,000 tons of ammonium nitrate will go into mixed fertilizers in 1944.

That a probe for hot haymows is now available? This piece of equipment consists of a pipe with a thermometer inserted in a pointed nose. A reading as high as 150° F. indicates danger from spontaneous combustion. If a similar gadget were available for investigating the subsoils in some of our orchards, we venture the opinion that the cause of poor yields would be apparent. Unlike haymows, some of them would probably register "not so hot."

That an individual in Stewardstown, Pa. is interested in buying apple logs, for which he pays $40 a thousand board feet? The logs must be green, not dead or wormy, and must measure 13 inches or over in diameter at the small end, and may be as short as 3 feet. For further information, consult R. B. Parmenter, Extension Forester, M.S.C.

That the ability of a rye plant to withstand deep freezing of the soil may be due in part to the elasticity of the roots? Unlike the roots of many other plants, including strawberries, a rye root may stretch an inch or more without damage. Thus the rye plant possesses at least two advantages as a cover crop, namely, its ability to grow in late fall and early spring, when the temperature is too low for most other plants, and the ability of its roots to withstand stretching.

That thawing of the soil in spring takes place both from above and below? In view of the fact that the soil just below the frozen layer is considerably above the freezing point, thawing from below may be relatively rapid. Thus a deeply frozen soil is ready for tillage much earlier in the spring than if all the thawing were to take place from above.

That one of the most efficient packers of apples in the Wenatchee district in Washington is totally blind? At first she packed about 50 boxes per day although now she is able to pack more than 90.

That the interval between full bloom and fruit maturity is fairly constant from year to year for a given variety? The apple is more consistant in this respect than other fruits which have been studied. There appears to be a greater variation in the bloom-maturity interval in early maturing than in late maturing varieties. H. B. Tukey of the Geneva, N.Y. Experiment Station suggests that growers, by keeping records, may obtain information which should be useful in planning their orchard operations. M. H. Haller of the U.S.D.A. in a study of four varieties, Williams, Jonathan, Grimes Golden, and Yellow Newtown, found that regardless of locality and seasonal variation, the number of days from bloom to maturity is quite constant. With the above varieties, he suggests that harvest should not begin until at least 70, 130, 135, and 150 days, respectively, after full bloom. The optimum maturity stage would be somewhat later.

That sawdust is proving to be a desirable mulching material for blueberries? In a study of mulching materials in Georgia, where temperatures are high and there is frequently a deficiency of soil moisture, sawdust because of its ability to reduce evaporation and runoff, was by far the best mulch material tested. Being cheap and easily available, it is recommended for mulching blueberries in the Southeast. Looser materials, such as straw and oak leaves, were better than clean cultivation but not so effective as sawdust.

That strawberries sometimes yield better under a spaced runner system than in a matted row? In West Virginia, five varieties, Blakemore, Catskill, Culver, Fairfax, and Howard 17, were spaced 8 inches apart. In each case the spaced plants outyielded the same varieties in matted rows. Under Massachusetts conditions, we sometimes get a better yield with certain strong growing varieties like Catskill, although the Howard 17 may do almost as well in a matted row.

That there are at least four reasons why some growers have failed to get satisfactory results with sprays applied for controlling McIntosh drop? Among these reasons are: (1) Faulty coverage. It takes much more material and a better distribution to wet the stem of each apple than is applied in the average spray during the spraying season. (2) Temperature too low. The spray is much less effective if applied when the temperature is 60 degrees than at 75 degrees. (3) Faulty timing. Since the spray is effective on McIntosh for only 9 or 10 days at best, the effect in some cases wears off before the apples are due to drop. In other cases, the apples may begin to drop before the material becomes effective. This latter interval is about two days. (4) The McIntosh variety is less easily influenced than certain other varieties. Williams, Duchess, Delicious, and certain other varieties are apparently held on the tree more easily than McIntosh.

That more than 7,000 varieties of apples have been named and introduced? As late as 1900, 340 varieties were recommended, and nurseries were selling at least 1400 kinds. The variety list has rather steadily narrowed down until today only about 30 varieties are of commercial importance. Considering the 1942 and 1943 production, Delicious led all other varieties in importance, followed in order by Winesap and McIntosh.

--L. Southwick

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## CHANGES IN 1944 APPLE SPRAY CHART

We have been informed by the printer that the 1944 Apple Spray Charts have been shipped. They will be distributed to county agents and growers immediately upon their arrival. The chart this year has been printed on two sheets so that the notes can be referred to more conveniently. In general, changes in the Spray Chart this year are of a minor nature. It will be noted that wettable sulfur may be used in Emergency Spray A instead of lime sulfur provided that this spray is applied merely as a protective cover. Lime sulfur must be used if scab spots are to be burned out.

A revised Spray and Dust Chart for Peaches is expected to be available for distribution presently.

--O. C. Roberts

BLUEBERRY VARIETIES

During the past two or three years there has been an increasing interest in the planting of cultivated blueberries. As with other fruits, a careful selection of sites, soils, and varieties is highly important in making a good start.

Better blueberry varieties are being introduced so rapidly that in a very few years much better varieties than those in our present list will be available. Since this will probably be just as true 3, 5, 10, or 100 years from now, the grower who always waits for those better varieties will probably die waiting. "Time is now," so let us make the best of what we have.

Since blueberry varieties vary from partly to totally self unfruitful, two varieties are needed for cross pollination. The commercial list is short, - Pioneer, Rubel, and Wareham. To these might be added Cabot where an early variety is desired for roadside stand or local trade.

Pioneer is a midseason variety, ripening from middle to late July or early August. The berries are large, fine flavored, attractive, and good keepers. The bush is of medium height and fine appearance for ornamental planting. Unfortunately the yield is low and it is difficult to propagate and prune. It is being rapidly replaced in other sections and will probably be replaced in Massachusetts as soon as a better midseason variety appears.

Rubel is a late variety, ripening a few days after Pioneer. It is a good producer. The berries are only fair in size, but their color and quality are good and they ship well. The bush is tall, upright, well shaped, vigorous, and easy to propagate and prune. This is one of the best varieties for the home gardener because it will withstand adverse conditions as well as any and better than most other varieties.

Wareham is an excellent late season variety, ripening a week after Rubel. The bush is vigorous, upright-spreading, easy to propagate and prune, and yields heavily. The berries develop good size throughout the season and have a highly aromatic, wild flavor which is well liked by most and highly pleasing to some. Although it starts with Rubel, it ripens about 15% of its crop after all other varieties are through. Unfortunately, it is dark in color and, therefore, not so attractive as other varieties and cracks badly following rains.

Cabot is an early variety, ripening a few days to a week before Pioneer. The berries are large and ship well but are rather flat in flavor. The plants are low and spreading and not so vigorous as Rubel, but yields are good. They are hard to propagate, costly to prune, and very susceptible to Phomopsis gall, a trouble which looks much like crown gall.

Other varieties which are recommended for trial only are:

Stanley is a promising midseason variety. The fruit is large, handsome, and excellent in flavor. The bush is upright, fairly vigorous, productive,

and easy to propagate and prune, but doesn't sprout so freely from the base as could be desired. It may be a suitable replacement for Pioneer.

Jersey, which ripens with Rubel, looks very promising. The bush is very vigorous, upright, productive, and easy to propagate and prune, but does not sprout from the base so freely as is desirable. The berries are long stemmed, making for easy picking, large sized, very attractive, and keep and ship well. The flavor is excellent if the berries are well ripened, otherwise they are sour. Since the berries turn blue a couple of days before they are ripe, it is very difficult at times to keep pickers from picking the underripe, very sour fruit.

Pemberton is a very promising new variety which ripens with Rubel. The bush is upright, very vigorous, productive and winter hardy. The fruit is unusually large, attractive, and fine flavored. It is easy to prune and is said to be easy to propagate. It's worst faults are a large watery scar where the stem separates and the tendency for a little piece of skin to tear off with the stem. This leaves a place for molds to enter and start decay if the berries are not used within a few days.

Atlantic and Burlington, two other new varieties, have not yet been fruited at the Massachusetts Experiment Station, but information available indicates they are worthy of trial.

Dixi, although introduced several years ago, has not been tried extensively enough yet to warrant any very definite opinions about it. The berries are very large, attractive, fine flavored, and ripen late. It is worthy of trial.

--J. S. Bailey

## MANURE FOR CULTIVATED BLUEBERRIES

Dr. F. V. Coville, the father of blueberry culture, in his early greenhouse experiments with blueberries found that manure was so very toxic, in fact killed some of the plants, that he never carried the experiments into the field. His repeated warnings against the use of manure were heeded for 20 or more years. Then a few growers of blueberries because they were more venturesome, or hadn't heard of Dr. Coville's warning, tried manure in the field with apparently good results. For this reason, an experiment was started at Amherst in 1941 to compare three manures, cow, horse, and poultry, on cultivated blueberries.

Horse manure was applied at the rate of 10 tons per acre, the first year, and 20 tons per acre the next two. The other two manures were applied at such rates as to give approximately the same amount of nitrogen as in the horse manure.

It is noteworthy that the blueberry plants have thrived and produced heavily under this treatment with no signs of the toxicity reported by Dr. Coville. The choice of a manure seems to be immaterial as all gave equally good results.

--J. S. Bailey

## DEVELOPMENT OF THE EUROPEAN RED MITE

The abundance and rate of development of the European red mite during the summer is largely dependent on the weather and the activity of natural enemies. Under favorable conditions, the mite requires about 20 days to complete its life cycle and there may be six generations in a season. The earlier that a large population develops, the more likely that predators and a decreasing food supply from overcrowding will reduce the population to a minimum by early fall. When this occurs, the number of winter eggs is usually small. A large number of winter eggs usually follows unfavorable conditions, and light or moderate infestation in mid-summer, which hold the predators to a minimum but permit a moderate infestation to develop by early fall when the winter eggs are laid. Dormant sprays seldom give complete control but usually prevent large populations of red mite in early summer. In spite of good control of winter eggs, a heavy or moderate infestation may develop after July 15 if conditions are favorable. Bronzing of the foliage reduces the photosynthetic capacity of the leaves (ability to manufacture food) which decreases new growth and interferes with the proper maturity of the fruit. The earlier in the season that this occurs, the greater effect it has on the normal development of the crop. The following table shows the expected development of the European red mite under various weather conditions. There are many exceptions to this theoretical table. In general, the conditions in 1943 are represented by Few Winter Eggs, Cool and Wet Weather in May and June, Hot and Dry Weather in July and August; a slow development of natural enemies and a consequent moderate to heavy population of eggs this winter. Spraying with oil emulsion at dormant or delayed dormant is the best insurance against a destructive infestation in early summer.

--W. D. Whitcomb

EFFECT OF WEATHER AND NATURAL ENEMIES ON THE DEVELOPMENT OF THE EUROPEAN RED MITE

| NO. OF WINTER EGGS | DORMANT TREATMENT | PROBABLE INFESTATION | | | | NUMBER OF NATURAL ENEMIES | WINTER EGGS LAID |
|---|---|---|---|---|---|---|---|
| | | MAY - JUNE | | JULY - AUGUST | | | |
| | | WEATHER | INFESTATION | WEATHER | INFESTATION | | |
| Many | None | Hot and Dry | ***** | Hot and Dry | * | Many | * |
| | | | | Cool " Wet | *** | Moderate | *** |
| | | Cool " Wet | ** | Hot " Dry | **** | Many | * |
| | | | | Cool " Wet | *** | Moderate | *** |
| Few | None | Hot and Dry | *** | Hot and Dry | ***** | Many | * |
| | | | | Cool " Wet | *** | Moderate | *** |
| | | Cool and Wet | * | Hot " Dry | **** | Moderate | *** |
| | | | | Cool " Wet | ** | Few | ** |
| Many or Few | Oil | Hot and Dry | * | Hot and Dry | *** | Few | **** |
| | | | | Cool " Wet | ** | Moderate | *** |
| | | Cool and Wet | * | Hot " Dry | *** | Moderate | *** |
| | | | | Cool " Wet | * | Few | ** |

Each * equals proportionate increase or decrease. Five * equal maximum infestation.

# Fruit Notes

March 27, 1944

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



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## CAUSE OF INJURY FROM OIL SPRAYS

Oils cause injury by smothering or excluding the supply of oxygen and possibly by breaking down the cell contents. On the bark of dormant trees injury is apparently due to the penetration of the oil through the outer bark to the cambium. Under favorable conditions the recommended amount of oil in a spray will evaporate or dry before it penetrates to the living cells. However, if more than a safe amount is applied, or the rate of evaporation is decreased by cold, or by high humidity, the oil may have time to penetrate the cambium before it dries.

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Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

Many remember that when dormant oil sprays were first recommended caution against freezing was strongly emphasized. If the emulsion freezes before it dries, the oil separates and collects in larger drops which do not dry as rapidly as the smaller drops dispersed through the emulsion. Therefore, oil sprays should be applied when the weather is clear and drying may be reasonably expected in a few hours. Oil injury frequently develops first and more seriously on the small twigs where the bark is thin. Here the cambium is less protected and the living cells are nearer the surface.

--W. D. Whitcomb

## PEACH CROP PROSPECTS FOR 1944

If the College peach orchard can be taken as a good indicator, the prospects for a full crop this summer is very bright. None of even the most tender varieties, such as Elberta, Hale, Goldeneast, and Halehaven, has lost over 35 percent of its buds and most have lost less than 25 percent. The more hardy varieties such as Champion, Marigold, and Oriole have lost only a few buds. Varieties like Champion, which set fruit buds very poorly, usually average 10 buds per foot of shoot. Ordinarily a tree should not be allowed to bear more than 2 fruits per foot. Therefore, 60 percent of the buds can be lost and still have left twice as many as should be allowed to develop into fruits. Varieties which set fruit buds very freely, 30-40 per foot, such as Cumberland or the old Greensboro, can lose a higher percentage and still have enough left for a full crop.

--J. S. Bailey

## CAN WE THIN THE 1944 APPLE CROP?

Probably few fruit growers do as much thinning as they should. This year will present an especially difficult situation. Several Experiment Stations have studied the possibilities of applying a caustic spray at blooming time to control the set of fruit. We have in preparation a brief summary of the results of these experiments. It is a little early to advise the general use of these blossom sprays but they show promise. We expect to make some trials next summer. If any grower wants to try them in an experimental way we are glad to offer assistance and advice.

--J. K. Shaw

(The Extension Service is in position to cooperate with at least five Massachusetts apple growers interested in testing the material mentioned above. Any reader of Fruit Notes interested in mapping out a test in his own orchard, with the idea of checking results, is invited to drop a line to W. H. Thies, M.S.C., Amherst, Mass.)

HELP!! - Two eastern Massachusetts apple growers are looking for orchard foreman. One of these vacancies is in a large orchard and the other in a medium sized orchard. Both appear to be good opportunities for experienced men. Another apple grower is interested in buying a good orchard of at least 500 bearing trees. Details concerning these three inquiries may be obtained as indicated in the paragraph above.

# Do You Know That:

That the importation of dried figs into the United States has dwindled from a high of 20,300 tons in 1925 to only 700 tons in 1940? From 45 to 75% of the imported figs formerly came from Turkey. The state of California shipped its first carload of dried figs to eastern markets in 1889. During the ensuing 50 years production has increased to 32,800 tons of dried figs and 19,000 of fresh fruit from a bearing acreage of 34,826.

That about 3,000,000 lbs. of apple syrup was made from the 1942 apple crop? 100 lbs. of apples make approximately a gallon of apple syrup weighing 11½ lbs. At 16¢ a lb. for syrup, the processor should be able to pay about 60¢ per 100 lbs. for apples. The largest single use of syrup is in the tobacco industry where this syrup is being used in place of glycerin.

That about 20,000,000 Victory Gardens were planted in 1943? The goal of 18,000,000 was exceeded by 2,000,000. In these 20,000,000 gardens, 8,000,000 tons of food were produced, worth conservatively half a billion dollars. Yet probably a third of the Victory Gardeners were rank beginners. The goal for 1944 is 22,000,000 Victory Gardens, 6,000,000 on farms and 16,000,000 in towns and cities. These gardens should be made to produce 10,000,000 tons of food.

That a shorter storage life of hormone sprayed apples is due not to the use, but to the misuse, of this material? If the sprayed fruit is harvested during its normal maturity range over a period of 10 days to two weeks from the time of application, the storage quality of the crop is not materially lessened. It is only when the grower elects to permit his hormone sprayed fruit to hang on the trees to acquire additional size that increased ripening and impairment of storage quality will result from the use of the hormone spray.

That apples left loosely stacked under the trees over night may be cooler by morning than if placed in a crowded storage room? Fruit picked in the afternoon is ordinarily hotter than if picked in the morning. For this reason, there is a decided advantage in bringing fruit to the cold storage during the morning hours, only.

That top grafting of a single branch provides an effective way of solving the cross pollination problem? To provide a showy permanent bouquet of the pollinating variety a prominent limb well up in the tree and on the sunny side should be selected for grafting. Growers sometimes make the mistake of selecting an insignificant, low limb for this purpose.

That the farms of Georgia derive an estimated annual income of between $800,000 and $2,000,000 from pecans? If we consider the nearly 2,000,000 trees of bearing age, the yield per tree is disappointingly low.

That lack of crop due to insufficient pollination or to a poor spray program are two reasons why many apple trees grow too tall? By the time these shortcomings have been corrected, branches which would otherwise bend downward, are too stiff to be influenced to any extent. Other reasons for tall trees are orchard crowding and the development of two or more leaders.

That a Quad spray nozzle with 5/64th inch disc opening will deliver about 6 3/4 gallons at 300 lbs. pressure and 8 1/8 gallons per minute at 400 lbs. pressure? The spray drive, or distance the mist will carry, is stepped up from 15 to 17 feet by increasing the pressure from 300 to 400 lbs. Added spray drive helps to provide coverage on otherwise poorly covered top branches.

That the civilian population of the United States consumed about 75% of our total food supply last year? In reality the civilian supply is slightly higher than 75%, although for practical purposes the total food supply may be divided as follows: civilians, 75%; our armed forces, 13%; our allies, 10%, and our territories and neighbors, including Porto Rice, Hawaiian Islands and Alaska, 2%.

That a bushel of apples sold in Michigan last fall for $325? This was the sweepstake bushel at the apple show, a bushel of McIntosh grown by Homer Waring, and was auctioned to the highest bidder, the money being used for charitable purposes.

That our first knowledge of the plow, as used by man, comes from wall paintings in the tombs of Egyptian nobles of 3,000 years ago? The plowman is shown at work in a field with a plow made of a forked tree, one branch left long and attached to the ox yoke, the other cut short and pointed, to be dragged through the soil, and the butt of the tree was shaped into a handle. The Greeks used plows of a similar type, to which they added a metal point. The points for this primitive type of plow, made of a forked tree, were still made in Connecticut as late as 1923 for shipment to the backwoods in South America.

That almost 17,000 food stores distribute fruits and vegetables to New York City customers? Of this number, independent grocery stores number about one-third, chain grocery stores about one-tenth, and meat markets only 3%. The weekly sales of fruits and vegetables averaged in chain stores from 12 to 14% of all sales and they handled from 14 to 17% of the total fruit tonnage.

That the term "bearing age fruit trees" is very often a misnomer? Writing in the Rural New Yorker, H. B. Tukey says, "There is nothing wrong with the idea of bearing age trees. When trees are well grown in a nursery for this purpose, are transplanted in the nursery once or twice to develop a compact root system, and when a first class article is delivered, there is much to be said for the bearing age tree. The difficulty lies in the fact that so many bearing age trees are nothing more than left overs from seasons when the demand for nursery stock was not high. Such trees may have been neglected in the row, may have suffered foliage injury and borer attack, and may have otherwise been subjected to mistreatment. When such trees are dug and delivered as bearing age trees the planter really gets an inferior product and is inclined to be disgusted, not only with bearing age trees, but with the nurseryman who supplies them."

That prunes, steamed before dehydration, produce a dried prune very similar to the fresh prune in color? These new prunes have the pink to red skin color of the fresh fruit and the flesh is a golden yellow. The steamed fruit dries much more quickly than that treated in the usual manner, and after drying it cooks quickly. It is believed that the new product, if produced commercially, will make new friends for the already popular dried prune.

That the number of days between bloom and fruit maturity for a given variety is remarkably similar from year to year? The Geneva New York Experiment Station reports the following time intervals for several fruits: Early Harvest apple, 77 days; Oldenburg, 98 days; McIntosh, 127 days; and Rhode Island Greening, 135 days; Montmorency cherry, 62 days, Bartlett pear, 121 days, and Elberta peach, 128 days.

That Vitamin C is being extracted from green walnut hulls? These hulls have 20 times the vitamin C potency of orange juice. This extract is used for fortifying food products. Incidentally, Vitamin C is now being made synthetically and can be sold for about $1 per ounce.

That the average prices received by farmers for fruits of various kinds in 1943 were just about double those received in 1941? The average index numbers for the past four years are as follows: 1400 - 73; 1941 - 85; 1942 - 114; and 1943 - 179. For the first month of 1944 the index number was 204.

That the War Food Administration will establish support prices on certain fruits in order to encourage the utilization of prospective 1944 supplies? These support prices will apply to producers and processors of peaches and pears for canning and for the following dried fruits: Apples, apricots, clingstone and freestone peaches, pears, prunes and raisins.

That a decided shift from apples to nut crops has occurred in Oregon during the past few years? The apple acreage declined between 1910 and 1943 from 73,000 to 15,300 acres. During this time the walnut acreage jumped from 7,500 to 24,100 acres while filberts increased from 100 acres to 15,200 acres. Cherries increased during that period from 8,800 acres to 15,200 acres.

That the total supply of processed foods available in 1943 was 321,000,000 standard cases, a decrease of 38,900,000 cases from the 1942 total of 360,700,000? A standard case of fruit contains 24 No. 2½ cans each holding approximately a quart. Production of processed canned fruits decreased 16,800,000 cases in 1943, the total supply being 41,400,000 cases compared to 58,200,000 in 1942.

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IN TODAY'S MAIL - A letter has just been received from the district manager representing the manufacturer of one of the commonly used orchard sprayers asking that we refer to him, for prompt attention, any case in which a grower is having difficulty with that particular make of sprayer. He says, "If you know of any service problems of any particular grower I wish you would tell me about it. Whenever you have done this in years past it has been a service to the grower and to myself." This is too good an offer to pass up. Regardless of the make of sprayer, it should be put in first class working order before the beginning of the spraying season.

ORCHARD SOIL TILLAGE IN NEW ENGLAND

Fifty years ago, plowing and continued cultivation of apple orchard soils in New England were fairly common practices. Today the Sod-Mulch system, which is subject to many modifications, has been adopted by practically all of our commercial growers. The latter system tends to encourage good yields of well colored fruit. It also facilitates the penetration of rainfall and thus prevents, to a large extent, the erosion which was so common in clean cultivated orchards.

Our better orchard soils have a sloping or rolling topography and a fairly high elevation. Under these conditions, in the absence of contour planting, any extensive tillage is certain to encourage both sheet erosion and gullying. But if mulch material is applied around the trees in sufficient quantity to smother the grass more or less completely as far out as the tips of the branches, ideal conditions for tree growth and production are maintained without danger of erosion. Furthermore, the tremendous demands of an apple tree for water are better satisfied if rainwater penetrates where it falls instead of flowing to a lower level, as occurs when a heavy rain falls on a bare soil.

Another advantage of the Sod-Mulch system over plowing and cultivation lies in the maintenance of a smoother orchard floor. This makes it easier to travel through the orchard with a power sprayer or a truckload of apples. Plowing leaves dead furrows which are difficult to level off even with a disc harrow.

Many of our orchardists are broadcasting a complete fertilizer between the trees, in addition to supplying the nitrogen needs of the trees through a ring application of nitrogenous fertilizer. This practice, of course, adds to the reservoir of organic matter since it encourages a better growth of the existing cover. It may also bring about some replacement of plants in the cover, as for example, clovers in place of grasses. Since the supply of organic matter increases from year to year under this system if offers an opportunity to disc once or twice, in spring, the strip between the trees and thereby bring about partial decomposition of the organic matter. This releases nitrates and other mineral elements for the tree and eliminates for a brief period the competition between the tree and the cover crop. The tree is thus stimulated at a critical season, and later in the summer when tree growth should be completed, the cover crop has reestablished itself, and it proceeds to take up the nitrates which the tree no longer needs.

Partial cultivation of the surface six inches and incorporation of some of the organic matter into the surface soil offer these additional advantages: Soil aeration is improved. Compacting, due to heavy machinery, is corrected. And, in case the soil needs lime, an opportunity is offered to work it down beneath the surface. The magic influence of organic matter on the surface of the orchard soil and in the surfact layer are now so apparent to the New England apple growers that plowing and clean cultivation are becoming obsolete practices.

## GUMMING OF PEACH TREES

Persons with peach trees are often disturbed by the formation of masses of gum on the trunks or branches. This gumming is the natural means of the peach tree in protecting itself. Wherever there is a break in the bark, the sap oozes out, thickens, and forms a gummy mass. It may or may not be a sign of serious trouble depending on the cause of the injury.

If Johnny took a few shots at that peach tree with his air rifle or cut his initials in the bark with his new jackknife, there is no cause for worry. The injury will heal over in time and the gum will disappear.

On the other hand, there are some insects which eat into the bark and cause trouble. The most common of these is the peach tree borer. The grub of this insect eats the inner bark, or cambium, and young sapwood. It usually works near the ground line or just below it, although occasionally it is found well up the trunk or even at the base of the main branches. Masses of gum at or near the ground level are a pretty good sign that peach tree borers are present. They are a serious pest and should be dug out with a knife or treated with paradichlorobenzene. Directions for the use of this material will be sent on request.

Occasionally, when peach trees become very weak from improper care, shot-hole borers work in the tree. These little beetles make hundreds of little holes in the bark so that the tree looks as if someone had peppered it with a shotgun. The real remedy is to keep the trees growing vigorously, since shothole borers seldom attack vigorous trees. Strong stimulation of infested trees by heavy fertilization, pruning and cultivation may help the tree to outgrow the trouble but badly infested trees usually die.

Although there are certain diseases which cause slight gum formation on small branches and twigs of peach trees in this state, diseases which cause serious gumming on the trunks and main branches are not present. Therefore, any serious gum formation is probably not due to disease.

Where the bark splits as a result of winter injury, where a branch is broken off, or where the bark is chewed by rodents, gum formation will take place. The remedy is to make the tree outgrow the injury if possible.

--J. S. Bailey

## SPRING CONTROL OF PEACH TREE BORERS

Can peach tree borers be controlled in the spring? This question is often asked by those who failed to apply control measures at the proper time in the fall.

Because of low soil temperature in the spring, paradichlorobenzene, or PDB, has given universally poor results at that time of year and is, therefore, not recommended.

Then what about ethylene dichloride emulsion? Dr. Oliver I. Snapp of Georgia says, "Ethylene dichloride emulsion is effective at low soil

temperatures and, therefore, can be used late in the fall and early in the spring, when it is too cold for paradichlorobenzene to be effective." Fall applications of ethylene dichloride emulsion have been tried in the Experiment Station peach orchard for three years. Very good control of borers was obtained and no injury resulted when applications were made according to Dr. Snapp's recommendations. Since severe injury has occurred in some states and the reason for it is not known, this material is not being recommended for general use at any time of year. However, directions for its application are available and will be sent to anyone wishing to use ethylene dichloride emulsion experimentally at his own risk.

--J. S. Bailey

## PLANTING CULTIVATED BLUEBERRIES

Planting time is fast approaching and blueberries like other fruits are best transplanted in the spring, the earlier the better. But first, where shall they be put? The place to plant blueberries is largely determined by the nature of the soil. If the soil isn't right, the bushes won't grow. Low "frost pockets" are not good places. In such locations the bushes may be injured by cold in winter or the crop may be ruined by spring frosts.

The cultivated blueberry requires a moist, acid soil well supplied with organic matter. The amount of moisture in the soil is very important because the blueberry will not thrive with either too much or too little. Being a native of the swamp, it will stand flooding during the dormant season but its roots must be out of water during the summer. However, a soil that is merely saturated with water but not flooded is very unsatisfactory. The freezing and thawing of such a soil heaves the plants out of the ground, breaks their roots and results in very poor growth. On the other hand, the plants grow poorly and bear little in a dry soil. A soil that is constantly moist but well enough drained to prevent "water logging" is the ideal.

Most of the soils of New England are acid unless they have been limed. While these blueberries will grow in extremely acid (pH 3.5) to fairly acid soils (pH 5.6), they usually thrive best in soils classed as very acid (pH 4.5 - 5.0). The presence of wild swamp blueberry, leather leaf, cranberry, white cedar, or red maple indicates a good blueberry soil.

While most commercial blueberry plantings are on soils composed of mixtures of sand and peaty material, such a combination is not necessary as is shown by the fact that some plantings are growing well on sandy loams, loams, and even medium clays.

For a commercial planting the land should be plowed and harrowed thoroughly before planting. If this can be done a year in advance and a cultivated crop grown, or the land fallowed for a year, there will be less danger of grubs destroying the roots of the young plants.

Those who wish to grow a few plants in the backyard can remedy minor soil deficiencies if they are willing to take the time and trouble. If the soil has been limed, it is usually not acid enough for blueberries and is difficult to acidify. Otherwise, a bushel of acid horticultural peat, which

should be thoroughly wet before use, partly decayed leaves from hardwood trees, woodland turf or rotten wood from a decayed stump or log mixed with the soil in the planting hole helps to acidify the soil and retains moisture. More acidity can be developed by the application of sulfur or aluminum sulfate. During dry periods in the summer, it may be necessary to water the bushes.

Commercial plantings of blueberries are generally set 5 x 8 or 6 x 10 feet. The planting distance depends on the fertility of the soil, that is, how large the bushes will grow, and the cultivating tools to be used. If cultivation is to be by a one-horse cultivator, rototiller or some similar narrow equipment, 8 feet between rows is enough. However, if a large tractor and tractor equipment are to be used, 10 feet is none too much. If the plants are to be mulched - rotted sawdust, shavings, acid peat, waste hay or straw are all good - and/space is at a premium they can be set 7 feet between rows.

Blueberry plants transplant best if they are moved with a ball of earth. However, from nurseries in areas where Japanese beetles are present, it may be necessary to ship with bare roots. When the plants are received, they should be set as promptly as possible in holes a little larger than the root ball, and the soil firmed well around the root ball. They are best set a little deeper than they stood in the nursery. If the plants are received with bare roots, the roots should be carefully spread out in the hole and fine dirt sifted around them and thoroughly packed to eliminate air spaces. Never put fertilizer in the planting holes. It is likely to burn the roots.

--J. S. Bailey

## LITTLE KNOWN FACTS ABOUT APPLE SCAB

Several growers have shown an interest in the details of the apple scab disease. Some of the following facts might serve a practical purpose. However, they are intended for the most part as informative and interesting information.

Apple scab has been known since the early part of the nineteenth century. The fungus that causes the disease was first described by Elias Fries in Sweden, 1819. The first authentic record of the disease in America was from New York and Pennsylvania in 1834.

The disease is world wide, occurring practically wherever the apple is grown. Pear scab is caused by a distinct but closely related organism. The pear scab fungus cannot attack apple or vice versa.

A large share of the 80,000,000 lbs. of sulfur sold as fungicide is used against apple scab.

Cordley of Oregon in 1908 successfully used sulfur as lime sulfur for control for the first time (per record).

An estimated loss due to apple scab in Massachusetts for 1943 is 20% and this is an underestimation. New York State figures a loss not less than $3,000,000 annually. Yearly loss in Australia is estimated at $48.50 an acre.

There are two spore stages of the fungus, the spring spores called ascospores and summer spores termed conidia. It is well to know these terms.

Ascospores are shot forcibly from the old leaves on the ground a short distance into the air enabling the air currents to carry them farther.

At the peak of ascospore production, usually in the late pink, it is stated that in 45 hours 8,170,200,000 spores can be ejected from the old leaves on the ground in a 1600 square foot area. Keitt found an average of 289 ascospores per cubic foot of air in a 4 hour rainy period.

Mature ascospores are ejected 5 minutes after the leaves become wetted. The spores change color in maturity thus making it easy to tell when they are ready to be shot out.

Ascospores are four times larger than the majority of the sulfur particles in most sulfur sprays.

A moderate amount of infection can take place on unprotected leaves between 63° F. and 75° F., when the young leaves are wet for 12 hours. It takes only 18 hours of wetting with temperatures between 64° F. and 75° F. to get severe infection.

On terminals, leaves below the fourth leaf are resistant to the scab fungus. If scab appears on such leaves they were inoculated when young.

Although Baldwins are considered by many to be resistant to the scab fungus they may have as much infection as Macs. The fungus can change in its capabilities of attacking certain varieties.

Careful cost and production records have shown net profits, due to spraying, of $65 to $400 per acre.

The above are little known facts of my own choosing; the well known fact, of course, is that we still have plenty to learn about the disease and the fungus.

--Thomas Sproston

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WORCESTER CONCERN WANTS APPLE WOOD

A much better offer for apple wood than was reported in February Fruit Notes comes from a large manufacturer in Worcester. This concern needs sound apple wood of these dimensions: 2" thick, 6" wide or wider, and at least 1' long. One grower who plans to deliver some of this material says it takes about 1½ cords to make 1,000 board feet.
For further details contact W. D. Weeks, Worcester County Extension Service, Post Office Building, Worcester, Mass.

# Fruit Notes

April 20, 1944

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## EARLIEST YEAR ON RECORD FOR APPLE SCAB SPORE MATURITY

Mature apple scab spores were observed this spring in one of the College orchards on April 1, at the time fruit buds were barely in the silver tip stage. In view of this unusual situation, it is of interest to review the factors which are believed to influence the time of maturity of the winter spores.

Past observations indicate that, as a rule in Massachusetts, winter spores begin reaching maturity about green-tip stage; a very small per cent are ready to discharge at delayed dormant; the period of heavy discharge is

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from pink to calyx; and spore discharge thereafter falls off sharply with light discharges lasting until around June 10-15. In some seasons, spore development lags behind this so-called average or normal course, and in others, it is ahead of fruit bud development. In any season, leaves under any particular tree may vary considerably regarding the time at which the scab fungus reaches the spore-discharge stage.

One reason for the above mentioned variation among leaves is the difference in the time scabbed leaves drop from the tree. Those that drop first, other factors being equal, usually develop winter spores first the following spring. Mild, wet weather in the fall between leaf drop and the onset of winter usually favors marked development of the young perithecia (winter spore-cases) before winter weather forces them into a dormant state. Such perithecia are therefore likely to produce spores somewhat ahead of schedule the following spring. Hence, either premature defoliation or a mild, damp fall may result in early winter spore maturity the following spring.

An unusually late snow cover usually is followed by a comparatively late period of winter spore maturity. Likewise, regardless of what transpired in the fall and winter, a dry spring usually contributes to late spore maturity and delayed discharge, as occurred during the unusually warm, dry spring of 1942 which forced fruit buds far ahead of the normal season. Conversely, a wet spring, starting about the time fruit buds begin to swell, favors scab spore development even though the temperature may be so low that fruit buds make very slow progress. Such prolonged wet periods early in the spring are usually accompanied by cold weather, and such weather is likely to constitute a backward season for plant growth, as occurred in 1943.

What is the situation this spring? Premature defoliation last fall was common for scabbed leaves, and was followed by a comparatively dry fall. There was very little snow cover during the winter, and spring, this year, started out cold and wet. At present, apple fruit buds are about two or three days earlier than in the very late season of 1943. McIntosh buds jumped into silver-tip stage in Amherst on April 9-10 and they have remained there until the present (April 18), due to low temperatures. In Block A of the College orchard, on April 3 with fruit buds dormant, the farthest advanced perithecia showed asci formed, but not spores. On April 11 with buds in the silver-tip stage, immature spores were plentiful, but no ripe ones. On April 17 with buds still in the silver tip stage, a small per cent of winter spores had reached maturity and discharged during the preceding night. In Block D, scab spores were equally developed on April 11, following the warm period which forced fruit buds into the silver tip stage.

Other orchards in Amherst show various intermediate stages of spore development, between slightly earlier than normal and the stage in Block D at the College. If the season is normally wet from the present until blossoming time a majority of the spores in our Block D will have been discharged by that time. And if scab spore development in commercial orchards in other parts of the state is correspondingly early, which is probably the case, there will be an abundance of spores ready for discharge when the fruit buds reach the delayed dormant stage. This means that, generally over the state, growers will have to be doubly cautious to prevent primary infections, beginning at the full de-

layed dormant stage of fruit bud development, particularly since the scab carryover is heavy this year. Growers who apply an oil spray will very likely need to add a dry Bordeaux, to give 2 lbs. of metallic copper to 100 gallons, or make an 8-8-100 Bordeaux, and add the oil to it.

-- O. C. Boyd

## SCHEDULE OF SPRAY MESSAGE BROADCASTS

Following is a schedule for the broadcasting of fruit pest control information to be released by the Extension Service of the State College. The first message will be issued Monday, April 24. The message released each Monday afternoon will be broadcast Tuesday and repeated Wednesday, while the message released Wednesday afternoon will be broadcast Thursday and repeated Friday. Whenever occasions justify, new messages will be telephoned or wired to the radio stations for Wednesdays and Fridays to replace the repeat announcements. In compiling each spray service message, the Extension Service will have access to weather information directly from the East Boston Airport Station of the United States Weather Bureau.

1. WBZ, Boston and WBZA, Springfield; 1030K; at 6:25 a.m. following the weather report, and again at 6:55 a.m. Also, at 7:25 a.m. the weather report and spray message are repeated.

2. WNAC, Boston (and Yankee Network): at 6:25 a.m.

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|---|---|
| WNAC, Boston, Massachusetts | 1260 K |
| WAAB, Worcester, Massachusetts | 1440 |
| WEAN, Providence, Rhode Island | 790 |
| WICC, Bridgeport, Connecticut | 600 |
| WCSH, Portland, Maine | 970 |
| WLNH, Laconia, New Hampshire | 1340 |

3. WEEI, Boston, The "Farmers Almanac of the Air"; 590 K; at 6:35 a.m. immediately following the weather forecast.

4. WTAG, Worcester, Massachusetts; 580 K; 6:45 a.m. daily; again following the 1 p.m. news, and will include a new weather forecast received at noon.

5. WTIC, Hartford, Connecticut; 1080 K; 6:05-6:16 a.m. following weather forecast.

6. Possibly WLAW, Lawrence, Massachusetts; 680 K; ? a.m.

## ADVENTURE IN SOIL CONSERVATION

Anyone who advocates new agricultural practices runs the risk of being called an upstart, radical, or crackbrain. But come to think of it, many of the now approved farm practices were novel not many years ago. The use of commercial fertilizers made headway slowly in the beginning. Some

farmers thought that fertilizers would poison the soil, and, strangely, some few still think so. The farmer who built the first silo in his community was probably laughed at. Doubtless, the first orchardists to begin spraying were considered queer by their neighbors.

So it is to some extent with conservation practices, albeit many of these have been used for years in some sections. Some New England farmers have always used conservation methods, some are now trying them for the first time, and still others are considering their use. No doubt, the time will come when fundamental conservation practices will be as common as certain cultural practices now are. Fruit growers as a group are among the most open-minded and progressive farmers, and it is expected that they will adopt soil conservation practices when they become convinced of their soundness and practicability.

There are a few good conservation demonstrations in orchards of Massachusetts. More are needed for educational purposes. Orchardists who may want to try an adventure in soil conservation by way of contour planting will be given technical aid in so far as available technical personnel permits.

-- A. B. Beaumont

## POULTRY MANURE AS A STRAWBERRY FERTILIZER

Owing to its relatively high nitrogen content, poultry manure is recognized as an excellent fertilizer for stimulating vegetative growth. It is used to good advantage in a young orchard, and if certain precautions are observed, in a strawberry planting, but not during the bearing year, for at least four reasons: (1) It is a mistaken notion that a strawberry plant can be forced into heavy production by liberal fertilization in the spring of the bearing year. Fruit buds develop in September for the following June. For that reason no amount or kind of fertilizer between September and June will increase the actual number of berries. (2) While an application of a nitrogenous fertilizer in the spring of the bearing year encourages additional leaf growth, and consequently larger size berries, it also results in berries of poorer shipping quality. Loss in transit may be often traced to soft berries, resulting from a spring nitrogen application. (3) Increased growth of leaves, and incidentally of weeds, not only renders picking more difficult, but it prevents the berries from drying off after a rain. In a rainy season, such a planting presents a real problem in the form of decayed berries. (4) For obvious reasons, the mere thought of clusters of luscious berries resting on a layer of poultry manure is distasteful, to say the least. Clean berries, such as are harvested in a planting mulched with straw or pine needles, represent this fruit at its best.

It is not the intent of the writer to discourage the use of poultry manure in growing strawberry plants. It is a question, not of the material itself, but of the time of application. Poultry manure harrowed into the soil in advance of setting the plants, works wonders in growing vigorous runner plants. The amount of poultry manure to be harrowed in will vary, of course, depending upon soil fertility. There is probably no better fertilizer for

growing strawberry plants than either poultry manure or well rotted stable manure. More poultry manure should be used for this purpose in Massachusetts.

Another very effective way of using poultry manure is found in stimulating the cover crop to be plowed under in advance of setting the plants. For example, if rye is sown on a soil which has received a liberal application of poultry manure, a heavy growth may be expected. Then as the rye is plowed under, soil organic matter is greatly increased, and the strawberry planting is directly benefitted. One of the large producers of strawberry plants in New England has adopted this practice with good results. He grows fine strawberry plants on a soil well filled with organic matter from a rye crop stimulated by poultry manure.

One other disadvantage of applying poultry manure in the spring of the bearing year is briefly this: As the strawberry plants develop in the spring, the tender pedicels or fruit stalks are likely to be burned if they come in contact with this material. The writer recalls seeing a planting several years ago which looked as if it had been scorched by fire. The explanation was found in a layer of poultry manure which the well meaning owner had applied around the plants in early spring. With large quantities of poultry manure available for agricultural use in Massachusetts, ways must be found to utilize this material to good advantage. A considerable quantity can be used by strawberry growers, not as a spring tonic in the bearing year, but as a means of encouraging a strong growth of runner plants the first year. If vigorous plants are grown, and if they are well mulched in the fall, there is little or no need for fertilizers of any kind the following spring.

## BEE REPELLENTS

In the spring of 1943 some experiments were conducted at the State College by F. R. Shaw and A. I. Bourne to determine the repellent value of some of the suggested bee repellents. The reader may ask, "Why repel bees from fruit trees when they are known to be necessary for pollination?" The answer, of course, is that bees are needed only while the trees are in full bloom. They should leave promptly after they have accomplished their work, since they may later be poisoned by spray materials. In these experiments the following test was made on 10 Cortland trees. Applications were made on May 22, using carbolic acid, creosote, and a phenol preparation. The west side of each tree was sprayed with one of these materials, and the east side with a standard spray mixture, without any repellent.

The most apparent result was blossom injury. This appeared in all treatments, varying from 10 to 100%. The injury was indicated by a curling and browning of the petals which dropped sooner than the untreated petals. There was also some leaf injury, evident as a browning and drying of the tissues. Some of the veins appeared blackened, followed by a cupping and crinkling of the leaves. Fruit counts at harvest time showed no consistent differences in in the number of apples on the treated sides of the trees. Observations during bloom indicated that within one day's time there were about as many bees on the treated as on the untreated branches. In these experiments there was more injury to the tree from creosote than from the carbolic acid or phenol preparation. Feeding tests indicate that the addition of these materials tends to reduce the length of life of the bees. Whether this reduction is due to starvation or to actual poisoning has not been determined. With our present limited knowledge of bee repellents, the general use of such materials cannot be recommended.

## IMPRESSIONS IN THE HUDSON VALLEY

A recent visit to Ulster County across the Hudson from Poughkeepsie renewed our impression that it is the habitat of up and coming fruit growers. We came away with a few definite impressions. (1) The absence of old neglected orchards. Practically all the trees were young to middle aged and were well pruned, vigorous and apparently productive. Spraying was already under way (April 6). (2) Diversified plantings. While apple trees were most evident, many pear, plum, cherry, and some peach orchards were seen. Currants and grapes were common. This locality is well adapted to fruit growing, and market connections with New York City are good. But the most important factor is wide awake, up-to-date growers. We will not admit that they are any smarter than Massachusetts growers but we must put on steam if we are to compete successfully with them.

Many of our good orchards are growing old and we must have new plantings to replace them or we will fall behind in the race. Whether we should grow more fruits other than the apple may be doubtful. We cannot grow sweet cherries, and currants are out of the question in many localities because they harbor white pine blister rust. But why should we not grow enough pears, plums and peaches to satisfy state markets during our season? Growers would have to learn the fine points of the game, but that can be done.

Incidentally, two growers applied the new blossom thinning spray in 1943 to biennial bearing Wealthy trees. At the time they thought they had ruined the trees, but they harvested a good commercial crop last year, and the same trees promise to have a good crop this year.

-- J. K. Shaw

## CONTROLLED-ATMOSPHERE STORAGE IN NEW YORK STATE

Our trip into the Hudson Valley on April 5 and 6 was mainly to inspect, and discuss with the owners, two controlled-atmosphere storages. One of these storages is in Clintondale, operated by Mr. Jerome Hurd. The other is in Milton, operated by Mr. Claude Hepworth. These men operate both controlled-atmosphere and regular storage rooms.

Mr. Hurd's 8,000-bushel controlled-atmosphere storage was built some three years ago and was made "gas-tight" mostly by lining with sheet metal. He opened this room on April 1 and the apples were in good condition. Demand for them, of course, has been heavy. Mr. Hepworth's 13,000-bushel room was made over into a controlled-atmosphere storage by the use of special paint over concrete walls and floor and aluminum foil on the ceiling. Many of the McIntosh in this storage were grown in Upstate New York.

Both men are satisfied with their controlled-atmosphere storages, even though this year they cannot get the usual premium of 50 cents to a dollar over ordinary cold storage McIntosh. Mr. Hurd is building another large storage and is planning to make up to one-half of this new space into controlled-atmosphere storage. Two such storages were operated this year

in Western New York. At least three other men in New York State are planning to build this type of storage and it is believed that after the war, some 10 or 12 will be constructed. In short, there is an active and growing interest in this improved method of late storage for McIntosh. The apples keep longer and in better condition, and stand up well after removal. In the spring of 1943, controlled-storage McIntosh were listed separately on the New York market and will probably be so listed again when price ceilings are a thing of the past.

Considering its apparent success and its projected expansion in New York, it would seem that this type of storage should have a place in Massachusetts. Controlled-atmosphere storage of McIntosh in this state should probably be undertaken at first by a few individuals who fully appreciate its special problems and advantages. The experience of the few "pioneers" in New York would seem to justify the expectation of similar success on the part of a few progressive Massachusetts storage operators. We have had some experience in the operation of a small controlled-atmosphere room at the Massachusetts State College and are convinced of its practicability.

-- Lawrence Southwick and O. C. Roberts

## COSTS OF PRODUCTION

All fruit growers are and should be interested in costs of production, not only his own but those of his competitor, because his survival in the industry may depend on lower per bushel costs. The grower has little control over selling price, but he can exercise some control over costs of production. In central Washington it was found that the average cost of growing and harvesting apples in 1942 was 92¢ per packed box, but it varied from less than 60¢ to more than $1.60 per packed box. Packing and storage costs averaged 72¢, making a total average cost of $1.64 per packed box, ready for the buyer. This total cost varied from $1.32 to $2.32. The principal cause of this variation was yield. Growing and harvesting costs for those averaging less than 200 boxes per acre was $1.71 per box. This cost decreased with increasing per acre yields so that growers with yields of over 750 boxes per acre grew and harvested their apples at a cost of only 72¢ per box. Growing and harvesting costs were generally less in larger orchards varying from 80¢ in smaller orchards to 67¢ in larger orchards. (Washington Bul. 429).

-- J. K. Shaw

## PEACH PROSPECTS FOR 1944

The cold weather of early April seriously reduced crop prospects in southern areas. South of central Virginia to central Illinois there was more or less severe injury varying with area and orchard site. None has been reported north of this line. Indications are that while the crop in the southern area will be nearly twice that of last year, it will be not much over half that of the 10-year average. Perhaps the northern peach grower is going to get a break this year.

-- J. K. Shaw

## AN EASY WAY TO THIN FRUITS (?)

The use of caustic sprays applied at full bloom to thin apples and peaches has been investigated in various fruit growing states. In view of the prospective shortage of labor some of our growers may wish to try this method of thinning and promoting annual bearing of biennial varieties. No experiments have been made at the College but we expect to try it this year. We are not yet ready to recommend this practice except as an experiment. We would be glad to make suggestions to any fruit grower who wants to try it. Blossom spraying to thin fruits offers promise and when we learn just how to do it, we may adopt this new practice in fruit growing.

-- J. K. Shaw

## TREATMENT FOR MAGNESIUM DEFICIENCY

Some suggestions for the treatment of magnesium deficiency in apple orchards in Massachusetts are as follows:

(1) Broadcast one to two tons per acre of a high magnesium limestone, and work into the soil if possible. The limestone should contain more than 15 percent MgO. High magnesium limestone is available under the AAA program, it is often spoken of as dolomitic limestone. The use of limestone is expected to help tremendously in effecting a lasting cure of the trouble.

(2) Apply 5 to 10 pounds of Epsom salts per tree depending on tree size and previous symptom severity. This may be applied about the same time and in the same way that nitrogen fertilizers are applied. The magnesium in Epsom salts will be more quickly available to trees than that in limestone.

(3) Probably the quickest way to relieve magnesium deficiency is by spraying the foliage of affected trees with Epsom salts solution. Three special applications are suggested at weekly to ten-day intervals, beginning just after the calyx spray. Use 20 pounds of Epsom salts per 100 gallons of water. Lacking sufficient evidence on the safety of including the Epsom salts in the regular spray mixtures, special or separate applications are suggested.

(4) Be cautious in applying potash to orchards that have shown definite magnesium deficiency symptoms. Considerable evidence shows that potassium fertilization aggravates magnesium deficiency symptoms and there are apparently few orchards in this state that are suffering from an actual shortage of potassium at the present time.

-- Lawrence Southwick

## NEW SEEDLING APPLES

Some years ago, Professor F. C. Sears started a small apple breeding project at Massachusetts State College. Most of the trees have now fruited for one or more years and, as might be expected, they vary widely in both tree and fruit.

A very few have shown sufficient promise to merit propagation and further testing. We have a limited supply of one-year trees of four of these seedlings propagated on semi-dwarf rootstocks in the Experiment Station nursery. Any grower who would like to set a few of these trees for trial may contact the writers at French Hall, Massachusetts State College, Amherst, Mass. Only a few growers can be accommodated, of course, due to the small number of trees available. We will allot the trees and send them out as soon as possible. There will be no charge except for express transportation and naturally there is no guarantee that any of the seedlings will prove to be worth naming.

| Seedling Number | Description |
|---|---|
| A-13 | Cortland x Red Astrachan. Color like Cortland or well-colored Gravenstein. White flesh, good quality. Season - late August. |
| A-17 | Cortland x Red Astrachan. Bright red striped or splashed, 25-30 percent colored, attractive, good quality. Season - late August. |
| C-31 | McIntosh x Red Astrachan. Color deep red, good quality, ripe before Aug. 25. |
| F-10 | Northern Spy, selfed. Good color, somewhat small. |

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Red Baldwin. We also have a few trees of a new red sport of Baldwin which we will send out to two or three interested growers. This red sport was discovered on a tree in the Experiment Station orchard about 10 years ago. It was propagated and has now fruited at Amherst. There seems little doubt that it is a red sport. It colors somewhat earlier and takes on a very deep red by harvest. It may possibly be too dark or it may have other faults, but it seems to be worthy of further testing. Available trees are one-year whips.

--Lawrence Southwick and J. K. Shaw

## FERTILIZING CULTIVATED BLUEBERRIES

No fruit plant will grow and yield well if starved. The cultivated blueberry is no exception. Although care must be used not to burn young plants by too much soluble fertilizer, bushes in full bearing will respond favorably to heavy applications.

At present, the combination to use will be largely determined by what is available. Fortunately, a 7-7-7 combination, which is available this year, has been found to be excellent for blueberries. If the materials, labor, and time are available for home mixing, a good combination is:

| | |
|---|---|
| Nitrate of soda ..... | 450 pounds |
| Calcium nitrate ..... | 450 " |
| 20% superphosphate ..... | 800 " |
| Sulfate of potash ..... | 300 " |

This combination analyses about 7-8-7 and is especially good for very acid soils, below pH 5. In soils above pH 5, it is better to substitute 710 pounds of sulfate of ammonia for the sodium and calcium nitrates. This helps to make the soil more acid. The home gardener, to whom only 5-10-5 is available, does not need to worry. Since phosphorous is so rapidly fixed in the soil, the extra amount in this combination will probably make little difference one way or the other.

Since young plants are so easily burned by soluble fertilizer, it is better not to use any fertilizer the year the plants are set. The second year a very small handful well spread out may be used. Mixing an equal amount of dry sand with the fertilizer will facilitate spreading. In succeeding years, the fertilizer can be gradually increased until 600 to 1000 pounds of the 7-7-7 mixture is used when the bushes are in full bearing. A good rule to follow is 1 ounce per plant the year following planting and increase this 1 ounce per plant per year until a total of 10 to 16 ounces is reached. The amount to apply to bearing bushes depends on the fertility of the soil and the response of the plants. In this climate, fertilizer had best be applied in the spring. Fall applications may result in winter injury. Although the fertilizer can be put on all at once, just as growth starts, it has been found advantageous to split the amount and apply half when the plants start to grow and the other half 3 to 4 weeks later. In the Experiment Station planting, where the soil is about pH 5, it has been found a good practice to apply when growth starts, 600 pounds per acre of the recommended combination made up with sulfate of ammonia in place of nitrate of soda and then about June 1 apply 100 to 150 pounds per acre of sulfate of ammonia.

Experiments carried on at Amherst have shown that manure can be used on blueberries without producing the toxic effect that has previously been supposed to follow its use. Two tons of good poultry manure which contains 20 pounds of nitrogen per ton would be roughly equivalent in nitrogen to 600 pounds of 7-7-7. Two tons per acre is about 4 pounds per plant. The amount of manure applied can be increased if there is considerable litter in it. Since horse manure contains about 14 pounds of nitrogen per ton and cow manure 12 pounds, 1 1/2 times as much horse manure and 1 2/3 as much cow manure as poultry manure can be used.

-- J. S. Bailey

1944 Fruit Prospects. Assuming average growing conditions in 1944, total deciduous fruit production should be from 10 to 20% greater than in 1943. Indicated percentage increases over 1943 for various fruits are about as follows: apples 25, peaches 50, pears 15. There may be a decrease of about 10% for grapes and prunes. Citrus production will probably be maintainer near the high level of the past two years.

Farm Income. The total cash farm income is higher in this war period than during World War I. In 1943, it totalled 19.1 billion dollars, 31% more than the previous record income in 1919, yet prices per unit received by farmers averaged considerably lower in 1943 than in 1919. (Agricultural Situation, March, 1944). --Lawrence Southwick.

# Fruit Notes

May 31, 1944

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## WINTER INJURY TO RED RASPBERRY VARIETIES

Even though the winter of 1943-44 seemed to be a rather mild one, considerable damage occurred on bramble fruits, due probably to a combination of factors. December temperatures, while not extreme, averaged lower than for many years. The extremely light snowfall for the winter permitted the ground to freeze deeply, thus reducing the available water supply of shallow rooted plants. The mildness of late winter probably caused bud tips to open fairly early and while the ground was still frozen the drying south winds contributed materially to the situation.

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Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

While the amount of injury is generally less than a year ago, the crop of some varieties will be reduced. In the college planting, Indian Summer, Cayuga, Chief, Latham, Sunrise, Tahoma, and Ranere showed 10% or less of damage. Taylor, Ohta, Milton and Tennessee Autumn showed from 13 to 20%; Washington, Lloyd George and Newburgh from 30 to 50%; while Cuthbert, Marcy and Viking had from 60 to 70% of their total cane growth killed.

The above order of varieties, based on amount of injury, is considerably different from that of a year ago. This offers further evidence that a number of factors contribute to winter killing of bramble canes and that varieties react differently to these several factors.

-- A. P. French

FROST DAMAGE

The serious injury to fruit crops by frost on the morning of May 19 reminds us that even Massachusetts orchards occasionally suffer frost damage Although injury has been reported in some orchards in the state in other years, only once before in 37 years have we seen serious frost injury to tree fruits in the College orchards. Orchards planted in frosty locations suffer rather frequently.

This year's experience emphasizes the oft repeated advice to plant orchards only on sites considerably elevated above the stream level of the vicinity with opportunity for free air drainage and without bare areas above where heat radiation is considerable.

The question has been raised as to what temperature will kill blossoms or young fruits. Probably the temperature at which the tissues are actually killed varies within rather narrow limits. Since we measure the temperature of the air, near or even at some distance from the tree itself, we cannot easily tell what is the exact temperature of the plant tissue. These temperatures will differ somewhat. Hence, one cannot tell from a thermometer reading whether or not it has been cold enough to kill the fruit tissue.

Air temperatures at different points in an orchard on a still, frosty morning may differ several degrees, or enough to cause injury varying from none at all to complete. The differences in temperature between different orchards will be much greater. Hence, it will be found in some orchards that the crop has been completely killed while in others no injury has occurred.

It is probable that the tissue of young fruits will not survive temperatures of more than 3 or 4 degrees below 32° F. Tissue temperature tends to lag behind air temperature. Consequently, if the air minimum continues only a short time, the tissue temperature does not fall to that of the air. But if it continues long enough, the temperatures will be the same. Contrary to a common belief, young fruits in general are more easily injured than blossoms, and peaches in the balloon stage are hardier than at a later stage.

It will be three or four weeks after the frost before the full amount of damage can be estimated. The core seems to be most injured and such apples may drop later.

Fruits at different stages of development have endured the following temperatures for 30 minutes or less:

| | Buds Closed but Showing Color | Full Bloom | Small Green Fruits |
|---|---|---|---|
| Apples--Delicious, | 25° | 28° | 29° |
| Rome Beauty | 23 | 27 | 29 |
| Pears--Beurre Bosc | 27 | 29 | 29 |
| Winter Nelis | 26 | 28 | 29 |
| Peaches | 25 | 27 | 30 |
| Cherries | 28 | 28 | 30 |
| Plums | 25 | 28 | 30 |
| Grapes | 30 | 31 | 31 |

-- J. K. Shaw

## DWARFING EFFECTS OF MALLING STOCKS

Some people have the mistaken notion that all Malling stocks exert dwarfing tendencies. That, of course, is not the case. Certain Malling stocks result in trees of standard size, as for example, Malling XII. At the other extreme, Malling VIII results in a tree so dwarfed that it usually must be supported in order to remain upright. This is even more true of Malling IX. The latter is a very brittle stock but it is preferred to Malling VIII because it is easier to propagate. The following Malling stock numbers are arranged in approximate order of dwarfing:

Very dwarfing: VIII, IX
Semi-dwarfing: VII, II, III, V, IV, I
Standard or near standard: X, XIII, XV, XVI, XII

-- J. K. Shaw

## HEAVY BORAX APPLICATION MAY CAUSE INJURY

Apple trees are known to be quite resistant to boron toxicity. Yet experiments in New Hampshire show that it is possible to injure trees by excessive soil applications of Borax. An application of 5 lbs. per 18-year-old tree was as much as was safe. Applications of 10 and 20 lbs. caused injury. Trees on soils that have been limed will stand more borax than those on soils that have not been limed. If one keeps borax applications within the recommended amounts of not over 2 lbs. per tree, there is no danger of injury. (Proc. Amer. Society for Hort. Science, Vol. 43, page 21)

-- J. K. Shaw

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We are interested in knowing what has been done or is being done concerning the correction of magnesium deficiency in Massachusetts apple orchards. We would appreciate it if growers having a magnesium problem would drop us a line. -- L. Southwick and J. K. Shaw

## THE PEACH SITUATION

(The following information was obtained before the freeze of May 18-19. Hence the prospects here reported are subject to modification)

Judging from the results of a questionnaire sent to a number of peach growers over the state, the crop prospects are good. The information sent in indicates the following:

1. Fruit bud killing has been less than 25% in most orchards even on tender varieties. The highest killing reported was 50%.

2. Most young trees have made a good recovery from the severe winter of 1942-43.

3. Many trees 15 years old or older have not made a good recovery.

4. In a few orchards, trees under 3 years of age were severely damaged.

5. In most orchards, the bearing trees under 15 years of age appear to be in good condition to bear a crop.

Of 56 questionnaires sent out, 40 have been returned, representing about 15,000 trees. This is an unusually high proportion of replies. At a time when so many questionnaires are being circulated such a response is very gratifying. The writer wishes to thank the peach growers for their help.

-- J. S. Bailey

## PEACH THINNING

Although many peach trees appear to have made a good recovery from the cold winter of 1942-43, examination will reveal that they have much dead, dark brown heartwood. In spite of the thrifty outward appearance of the trees, their framework has been seriously weakened. The result is going to be a lot of broken branches and split trunks if the trees are allowed to carry too heavy crops. The answer, of course, is thinning. Thinning should pay additional dividends this year in the number of trees saved.

-- J. S. Bailey

## CONTROLLED-ATMOSPHERE STORAGE FOR McINTOSH

It is a recognized fact that the practicable limit of the storage life of McIntosh apples held in refrigerated storage at 32° F. is reached by the first to the middle of March and that McIntosh held later in the season lose most of that quality which has made this variety famous in the Northeast. A contributing factor limiting storage life of McIntosh in 32° F. storage is the danger of cold temperature troubles such as core flush or internal browning of the flesh near the core.

Extensive and careful experiments at Cornell University have demonstrated that McIntosh apples can be stored for the late spring market much more satisfactorily at 40° F. in controlled-atmosphere storage than at 32° F. in regular cold storage. Experiments at the Massachusetts State College support these findings.

Controlled-Atmosphere Storage - What it is. Controlled-atmosphere storage is a recently developed type of cold storage. Instead of the usual air (21% oxygen, a trace of carbon dioxide, and 78% nitrogen) in most ventilated cold storage rooms, the three constituents of air are maintained at artificial levels. In controlled-atmosphere storage, the oxygen is maintained at approximately 2%, carbon dioxide at 5%, and nitrogen at 93%. The temperature is kept at 40° F.

What it Does.

1. This type of storage is especially adapted to extend the storage season of McIntosh. Apples from controlled-atmosphere storage can be taken out in April and May in similar condition to those removed from average 32° F. cold storage in January and February.
2. Apples taken from controlled-atmosphere storage will usually keep several days longer at room temperature than apples from ordinary cold storage.
3. The 40° F. temperature eliminates most internal browning.
4. Shrinkage losses due to decay are reduced.

How it Works. Apples respire and in so doing they use oxygen and give off carbon dioxide. The rate of ripening and breakdown of apples in storage depend largely on the speed of this respiration. Therefore, any storage condition that tends to retard or slow down the respiration process prolongs the storage life of the fruit. The speed of respiration may be reduced in several ways, two of which are: (1) by lowering the temperature and, (2) by reducing the amount of oxygen. In ordinary 32° F. storage, low temperature alone is utilized; in controlled-atmosphere storage, both low temperature and low oxygen operate to slow down respiration and, hence, ripening. In short, apples "live" more slowly over a longer period in this new type of storage.

Special Storage Room Requirements. The maintenance of the artificial atmosphere requires that the storage be practically gas- or air-tight. This is achieved by special gas-proof linings (often galvanized sheet iron), caulking compounds, and special enamel paints in both newly-constructed and remodeled rooms. Most well-constructed rooms can be made sufficiently gas-tight for controlled atmosphere storage.

Special Equipment Requirements. An atmospheric washer or scrubber to remove carbon dioxide is necessary. When a gas-tight room is filled with apples and sealed up, respiration of the fruit proceeds quite normally. Oxygen is used up; carbon dioxide is given off. As the room is gas-tight, the oxygen content is gradually lowered and the amount of carbon dioxide increased. Since a high accumulation of carbon dioxide may be harmful, the concentration of this gas usually is not allowed to go above 5 percent. When this level is reached, the atmosphere in the room is forced through a simple washer containing a solution of caustic soda which has the capacity to absorb carbon

dioxide. Through this means, the level of this gas can be maintained at or below 5 percent.

Also, frequent analysis of the atmosphere in the room necessitates the purchase or construction of a gas-analysis apparatus. This job is not difficult but will require from 5 to 10 minutes per day. It must be emphasized that in this type of storage, the levels of carbon dioxide and oxygen must be controlled rather accurately; otherwise results may be disappointing.

Extra costs. As already indicated, there are certain added costs involved in both the construction and operation of controlled-atmosphere storage. It is estimated that the total cost per bushel in addition to ordinary cold storage costs is around 10-15 cents per season. Fifteen cents was the additional charge for storing McIntosh in a controlled-atmosphere storage in New York in 1943-44 over cold storage in the same building.

The Future of Controlled-Atmosphere Storage. Four storage rooms varying in capacity from 2,000 to 13,000 bushels were successfully operated in New York this past season (1943-44). All of these have been operated for two or more years to the satisfaction of the owners. Two more are under construction now; probably at least 10 will be built as soon as the war is over.

It seems that there is definitely an opportunity for the successful operation of a limited number of these storages in Massachusetts.

Construction in Massachusetts. The Departments of Pomology, Food Technology, and Agricultural Engineering will be pleased to counsel and assist in every way possible any proposed construction of controlled-atmosphere storages in this State.

(Prepared by the Departments of Pomology, Food Technology, and Agricultural Engineering, Massachusetts State College.)

## ORCHARD DEPRECIATION

The question of orchard depreciation has been recently called to our attention by two growers, Donald Priest of Groton and John Rice of Marlboro. Following is a copy of a letter of explanation written to Mr. Rice by W. G. Simmering of the Massachusetts Farm Bureau:

"As requested in your letter to Mr. Howard Russell, we are pleased to explain briefly our general procedure in handling depreciation for fruit growers. In this past year, we established a value on apple orchards at the rate of $300 to $400 per acre average, setting up this amount for each taxpayer in proper asset form and depreciating this amount at the rate of four and as high as five per cent per year. These amounts were properly established in reserve for depreciation form, thereby allowing for continuing the same procedure each year, also taking into consideration new additions to the orchard. As to a ruling from the Collector of Internal Revenue in Boston, there has been no such basis established, yet they tell us our figures are a fair allowance and would no doubt be acceptable. Should there be any further question, do not hesitate to write us so that your depreciation records may be established as early as possible this year."

PREVENT ACCIDENTS (From Circ. issued by U.S.D.A., February, 1944)

Suggestions for Accident Prevention on the Farm

(1) Are you protecting your family and property against fires? Do you -- Regularly inspect and clean chimneys and stovepipes? Avoid using kerosene and gasoline in starting fires? Insulate wood and other inflammable materials from the heat of stove and stovepipes? Store gasoline and other inflammable or explosive materials at safe distances from major farm buildings? Properly clean and adjust kerosene and other burners? Have handy means available for putting out fires?

(2) Are you protecting your family against preventable falls? Do you -- Use only safe ladders, securely fastened? Provide adequate handrails for steps, porches, stairways? Keep steps, porches, and stairways in good repair and clear of rubbish and all tripping hazards? Keep wells, cisterns, pits, etc., securely covered?

(3) Are you protecting your family against preventable injuries from animals? Do you -- Keep bulls, boars, and rams securely penned? Use care in handling animals with newborn young? Keep vicious dogs tied up and away from children? Speak to animals before entering stalls?

(4) Are you protecting your family against preventable injuries by machinery, tools, equipment of all kinds? Do you -- Keep all hazardous belts, gears, etc., well guarded? Permit only experienced operators on machinery? Stop equipment before adjusting, refueling, etc.? Keep children away from dangerous equipment? Safely use a nd store sharp-edged tools? Keep yard clear of broken tools, machinery, etc.?

(5) Are you encouraging accident prevention in your home? Do you -- Urge members of your family to work safely, play safely, drive safely, and otherwise prevent accidents by correcting conditions that might cause accidents? Have first-aid materials on hand for treatment of minor scratches and injuries? Are such materials safely placed away from children?

Accidents touch the life and pocketbook of one out of every four Americans. In 1942, accidents in the United States caused 93,000 deaths and 9,200,000 injuries and cost $5.200,000,000. Approximately 5 percent of these losses occurred on farms. This means that accidents killed 4,600 farmers, injured 450,000 farmers, and caused a loss of $26,000,000 to farmers and their properties. By being careful you can do your part in preventing farm accidents. Here is what you can do: Locate the danger spots on your farm. Get rid of these danger spots. Remember that most accidents do not "just happen." They are caused. Accidents that can happen usually do happen. Sooner or later an accident is likely to occur from a neglected dangerous condition. Know the causes of accidents and get rid of them.

Inspection points the way to protection. Find it and fix it.

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The compiler of Fruit Notes will spend the week of June 5 in Maine, attending a series of four twilight meetings and visiting as many orchards as time will permit.

REVIEW OF LITERATURE ON BEE REPELLENTS

Since certain individuals are urging the use of so-called repellents in spraying as a possible safeguard for bees, the following summary of experimental work is presented:

One of the earliest known references to the use of bee repellents was the recommendation in 1900 of carbolic acid for this purpose.

In 1921, Melander conducted some tests to determine the value of several materials as repellents. Among his conclusions are the following: (1) Creosote, creosol and carbolic acid are very repellent. (2) Carbon disulfide, nicotine sulfate and napthalene are quite repellent.

In 1922, Morse in eastern Massachusetts, suggested the use of a proprietary cresol compound, "Milkol." The only "evidence" was that bee losses were reduced even though all shade trees had been sprayed.

Dadant, 1923, declared that lime sulfur and bordeaux mixture were repellent to bees. He stated that these materials, mixed with spray solutions, would prevent bees from sucking up the poison.

Bourne, 1927, stated that nicotine sulfate acted as a repellent. Bees which had a choice of blossoms sprayed with solutions containing nicotine sulfate or untreated blossoms always preferred the latter.

In 1936, Root declared that the odor of creosote was not offensive to bees so far as is known.

Bottcher, 1937, stated that nicotine, lime sulfur, and sodium fluoride or sodium fluosilicate act as repellents.

Southwick, 1928 and later, has insisted that creosote, at the rate of one pint to 100 gallons of spray solution, is an effective bee repellent. He states that the use of this material has reduced bee losses.

Milum, 1940, stated that Milkol had been used as a repellent apparently with good results. He also thought that Black Leaf 155 might have some value since its residue would contain nicotine.

In 1941, Shaw and Mendall tested many materials including creosote, tar oil, phenol compounds, Milkol, naphthalene and alpha and beta naphthols. The number of visits of bees to treated foliage in all cases was less than to the untreated foliage. The materials were applied by means of a compressed air sprayer. It is realized that agitation might not have been adequate even though the sprayer was shaken thoroughly before any spraying was done. In all Milkol combinations, from slight to moderate blossom injury occurred. Both creosote and tar oil compounds produced severe blossom injury.

In 1942, Butler stated that in England no very satisfactory results had been obta ined with creosote and its use at present is not recommended.

-- F. R. Shaw

## KEEP NEWLY SET TREES GROWING

Recent dry weather is likely to raise havoc with young fruit trees, particularly on dry soils, unless water is supplied during this critical period. In a recent issue of a national magazine, John C. Snyder of Washington State College makes these pointed statements: "The root system of young trees is reduced about nine tenths when they are dug from the nursery row. It is considered a good practice to prune the top somewhat in order to cut down the amount of water needed; the reduced root system obviously can't supply the original water-losing leaf surface. However, it is not advisable to reduce the top to one tenth of its former spread in order to get balance between roots and leaf surface. Some orchardists reduce the pruning required by keeping the soil more moist than usual during the first half of the growing season. Keeping the soil moist around the roots and never allowing it to dry out helps the reduced root system to supply the tree with water. Plenty of water can be responsible alone for doubling the size of the tree by the end of the first growing season."

## PLUM CURCULIO PAYS ANNUAL VISIT

The last few days of May and the first few days of June are almost invariably the season of intense activity on the part of the plum curculio. This insect, which probably blemishes as many fruits as any other single insect in Massachusetts, is running true to form this season. W. D. Whitcomb reported on May 31 that curculio emergence was practically completed. This report is further emphasized by limited jarring tests in the Connecticut Valley. A 5- year-old peach tree was jarred twice on Thursday, June 1, netting 18 beetles in the morning and 6 in the evening. About 50 beetles have been collected from that tree thus far. Incidentally, the tree shows a heavy set of fruit and there are prospects of bringing a crop through to maturity by frequent jarring and collecting of beetles, even though no lead arsenate is applied. Can the reader visualize combatting curculio with a baseball bat? This weapon, well padded, is being used on the above peach tree as a means of jarring the individual branches and thus dislodging the beetles.

## USED CONTAINER SITUATION (Maine Fruit Notes, by R. N. Atherton)

With the increased arrivals of southern vegetables, some types of used packages are more plentiful in New York State markets, but in general the demand still exceeds the supply of most types. The general over-all container situation has not improved, and in some spots is somewhat worse, due to continued manufacturing difficulties. Barring further and new unexpected disaster, prospective crops will require every new and used container that can be made available. Reports on the probable carry-over of new baskets, hampers and boxes from last year's short crops are necessarily incomplete and inconclusive, but they range from 10 to 25 percent of requirements in New England, the four Appalachian States, South Carolina and Georgia, the most pessimistic outlook being in the Middle West and New York where the carry-over is practically negligible. In only one or two instances (Maryland and South Carolina) does it appear that actual delivery in appreciable quantities has been made on confirmed orders,

## BLOSSOM THINNING SPRAYS

The Experiment Station has started work to learn something about the value of caustic sprays for thinning apples and peaches. Comparisons are being made of different concentrations, time of spraying, and number of sprays. It is too early to draw many conclusions. The injury to the foliage was less than expected and the trees now show little or no injurious effects of the spray. It is evident that the sprays were more or less effective and we hope to learn something of the best procedure. We would be glad to hear from growers who have tried this method of thinning. The frost was more effective but less discriminating. Fortunately, most of our experiments were on trees which suffered little or no frost injury.

-- J. K. Shaw

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Too many apple tree trunks in Massachusetts are covered by a dense growth of poison ivy. It is no wonder that apple pickers who are susceptible to ivy poisoning stay away from such orchards. Mid-summer is the time to tackle the poison ivy problem, using as a weapon that newly developed chemical, Ammonium Sulfamate.

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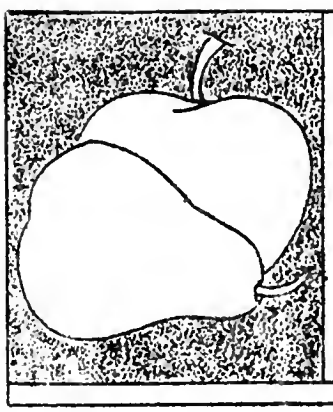
## ORCHARDS ALL OVER THE HILLS

New orchards now grow near the woodlands
They're planted all over the hills,
Overlook the broad vales and deep valleys,
The brooks and the rivers and rills.
On lands once abandoned and barren,
All covered with mosses and fern
The perfume of bloom in the springtime
Returns and fond memories burn.

The spirits of folks who once lived here
Have come back to earth once again,
To guide us and cheer us and bless us
And reward us for trouble and pain.
Restored are the farms of our fathers,
Brought back are the lands of their toils.
New life has now come to these hillsides,
New enterprise back to these soils.

The fruits of our labors shall fill us
With gladness, contentment and cheer,
And fruits of these orchards shall ever
Bring freedom from want and from fear.
And now to our God in His Heaven
We pray for the strength to go on
Until all these hills of our birthright
Return to prosperity's dawn.

-- R. H. Lovejoy
County Agr'l. Agent
Sanford, Maine



# Fruit Notes

June 28, 1944

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



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## X-DISEASE CONTROL

It is time to get after the chokecherries around peach orchards or prospective peach sites. Eliminating the chokecherries is the only known method for the control of X-disease, or yellow-red virosis, of peaches. This disease is known to be carried as far as 200 feet. For safety, chokecherries should be eliminated for a distance of 500 feet.

Chokecherries are best eliminated by the use of a weed killing spray. Such sprays are carried from the leaves into the roots and thus kill the whole plant. Treated in this way, there is no crop of suckers to deal with, as would follow mowing or attempts at digging them out.

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Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

Two types of sprays are available, those containing ammonium sulfamate and those containing sodium chlorate. The ammonium sulfamate type is slightly more effective in killing chokecherries, is easier to handle, leaves no undesirable residue in the soil, and no fire hazard is involved in its use. On the other hand, it is more expensive per pound, and is corrosive on metal parts, particularly copper.

The manufacturer has made several suggestions for overcoming the corrosive effect of ammonium sulfamate. Mix oil with the spray or coat the inside of the tank with grease. Hanging a strip of zinc or putting some granulated zinc in the spray tank is said to help. Most important is to wash out the sprayer thoroughly after use. Adding hydrated lime or baking soda to the last rinse water is recommended. Probably adding a couple of pounds of spray lime to 25 gallons of water and washing the sprayer out thoroughly are most practical for the fruit grower with a large sprayer.

-- J. S. Bailey

## NOTES ON FRUIT INSECTS

Apple Maggot: The number of maggot flies which had emerged in cages at Waltham on June 23 was 72, equal to 24% of the expected number. This number of flies has not been collected in other years until July 5 to 10. In addition, at least 1 maggot fly has emerged from last year's cage, having been in the soil since September, 1942. These observations indicate that either emergence is 2 to 3 weeks earlier than usual or that the number of flies surviving the winter is greater than normal, or both. Also, that some flies which did not emerge last year, probably because of the dry soil in July, will appear this year.

For maggot fly control, spray or dust is usually applied when the emergence reaches 15 to 20%, and again just after the peak of emergence. Therefore, the spray program may be adjusted as follows: Where the 2nd Cover spray was not applied before June 18, this application will serve as the first spray against maggot. The 3rd Cover spray should be timely July 5 to 10. On early maturing varieties this should be sufficient protection for the season. On late maturing varieties, a 4th Cover spray July 25-August 1, may be necessary to protect against late migrating maggot flies, and also to control 2nd brood codling moth and leaf roller. If dust is applied, 75-25 or 70-30 sulfur-lead arsenate dust should be used in the 4th Cover.

If the 2nd Cover spray was applied before June 18th and the rainy period, June 19-22, the 3rd Cover spray will be timely June 30-July 3, and the 4th Cover spray about July 12-15. This will make another application for late codling moth and leaf roller advisable July 25-August 1.

Green Apple Aphis: The green apple aphis lives on the apple throughout the summer usually concentrating on watersprouts after July 1. Its abundance is governed largely by the number of predators, such as ladybird beetles, lace wing flies and syrphus flies. These beneficial insects were abnormally abundant this spring but appear to have been greatly reduced

by the freeze of May 19. They should increase in numbers now. It is doubtful if spraying to control the green aphis is necessary unless they become so abundant that they make the fruit sticky from honeydew.

Oriental Fruit Moth: Although the Oriental fruit moth larvae of the third generation normally feed in peach fruits, they can survive as twig borers in the absence of fruit especially in vigorous trees which continue to produce twig growth throughout the summer. They also live in the fruit of quince and apple. Observations so far this season indicate that enough Oriental fruit moths survived in 1943 to produce a small or moderate twig infestation by the first generation. The development of the later generations will depend on weather conditions.

-- W. D. Whitcomb

## SEEN AND HEARD IN MAINE

During the week of June 5 the writer had the privilege of attending four twilight meetings in Maine and visiting about twenty fruit farms. Following are a few random observations: (1) A one-man spray outfit. In the orchard of Wilson Morse a very thorough spray program is being applied, using a very ingenious arrangement whereby the tractor driver also operates an elevated multiple nozzle spray broom. The speed of the tractor is so regulated that even the largest trees receive their full quota of spray material. Mr. Morse has produced remarkably clean crops in years past by applying only three sprays. About 15 years ago a new set of lower limbs was established in a block of high headed apple trees, through the method of inserting scions at carefully selected points on the trunk. By placing the scions upside down, these limbs developed at an ideal angle both from the standpoint of strength and ease in harvesting. Capitalizing on our present day knowledge of orchard subsoils, Mr. Morse is making an investigation of subsoil conditions in a nearby field where, if conditions warrant, he plans to set a new orchard. Several holes were dug in this field to a depth of 2 feet or more to determine what newly set trees may be up against.

(2) Scarcity of plum curculio. In at least a dozen orchards careful observations were made to discover which pests were present. Without looking at the map we were absolutely sure that we were not in Massachusetts. Plum curculio was conspicuous by its absence. Only here and there was a light infestation observed. Even where apple and plum trees were growing in close proximity to stone walls or brush land, plum curculio appeared to be a pest of minor importance. In a Kezar Falls orchard one particular tree (August Sweet) showed a rather heavy infestation of apple curculio, but no plum curculio beetles were observed. The orchard owner, Daniel Lord, reported a similar condition in that one tree in years past and occasionally a light infestation in his Northern Spies.

(3) Frost damage. Except in the University orchard at Orono where frost damage was rather severe, very little damage to apples or other fruits was observed in any Maine orchard. On the average, the set of apples is relatively heavy and only in an occasional frost pocket is the damage worthy of

mention. Incidentally, Maine escaped the severe freeze which occurred in Massachusetts May 19. A later frost about June 3 caused some damage to vegetable crops but relatively little to fruit crops.

(4) Among the fungus troubles observed were several rather severe infections of apple scab, particularly in orchards relatively near the coast where foggy conditions prevail. In two orchards plum trees showed evidence of Plum Pockets and in two peach orchards some Leaf Curl was in evidence.

(5) Other miscellaneous observations. Orchard crowding is as much of a problem in some orchards as it is in Massachusetts. Cutting back of temporary trees which was done last spring, will provide temporary relief in one large orchard. A rough stony orchard floor in a Wilton orchard suggests a need for a few hours' work with a bulldozer, to prevent wear and tear on the sprayer and the operator. Two heavy swarms of bees were observed within a few minutes in a couple of York County orchards. In both cases apple branches were heavily bent with the weight of bees awaiting the magic hand of a beekeeper. Trunk damage to the extent of killing one tree entirely was observed, following the wrapping with heavy paper of doubtful chemical content about two years ago. The bark beneath the paper was in one case completely killed. One enterprising grower with woodworking ability exhibited some sturdy, light weight step ladders which he constructs on rainy days, at the rate of about three per day. One grower with a block of exceedingly vigorous 5-year-old trees and a cover crop of equal vigor, is a strong believer in liberal fertilization. He used, in the form of ammonium nitrate, the equivalent of about 12 pounds of nitrate of soda per tree. Two spray rings are in operation with fairly good success. In one case where the operator uses a 500 gallon tank, it appears that the material is in some cases left in the spray tank too long, as evidenced by a black sludge on some of the trees. Spraying with epsom salts to correct a magnesium deficiency is becoming fairly common. One grower made a test of blossom thinning for the first time this year. The results, although variable, show some promise. As a final item, we report a peach crop in one orchard in 1943 amounting to exactly one peach, a Rochester. How this peach in the top of the tree came through a temperature of 20° below zero is a mystery.

GRASS (from The Soil Auger)

"Next in importance to the divine profusion of water, light, and air, those three physical facts which render existence possible, may be reckoned the universal beneficence of grass. Lying in the sunshine among the buttercups and dandelions of May, scarcely higher in intelligence than those minute tenants of that mimic wilderness, our earliest recollections are of grass; and when the fitful fever is ended, and the foolish wrangle of the market and the forum is closed, grass heals over the scar which our descent into the bosom of the earth has made, and the carpet of the infant becomes the blanket of the dead.

"Grass is the forgiveness of nature -- her constant benediction. Fields trampled with battle, saturated with blood, torn with the ruts of cannon, grow green again with grass, and carnage is forgotten. Streets abandoned

by traffic become grass-grown like rural lanes, and are obliterated; forests decay, harvests perish, flowers vanish, but grass is immortal. Beleaguered by the sullen hosts of winter, it withdraws into the impregnable fortress of its subterranean vitality and emerges upon solicitation of spring. Sown by the winds, by wandering birds, propagated by the subtle horticulture of the elements, which are its ministers and servants, it softens the rude outline of the world. Its tenacious fibers hold the earth in its place, and prevent its soluble components from washing into the sea. It invades the solitude of deserts, climbs the inaccessible slopes and forbidding pinnacles of mountains, modifies climates and determines the history, character and destiny of nations. Unobtrusive and patient, it has immortal vigor and aggression. Banished from the thoroughfare and field, it bides its time to return, and when vigilance is relaxed, or the dynasty has perished, it silently resumes the throne from which it has been expelled which it never abdicates. It bears no blazonry of bloom to charm the senses with fragrance or splendor, but its homely hue is more enchanting than the lily or the rose. It yields no fruit in earth or air, and yet should its harvest fail for a single year famine would depopulate the world." (John J. Ingalls)

Biographical note: John James Ingalls was born in Middleton, Massachusetts, December 29, 1833 and died in Las Vegas, New Mexico, August 16, 1900; was graduated from Williams College in 1855; moved to Kansas in 1858 and established a law practice; held various territorial and state offices, and served as United States Senator 1873-1891; and from 1891 until his death was a prominent writer and lecturer. Senator Ingalls was known as one of the Senate's most eloquent members. His statue is in the rotunda of the Capitol. He had an opportunity to see grass at its best on the virgin prairies of the West.

-- A. B. Beaumont

A MADE-TO-ORDER SCAB INFECTION PERIOD. The rainfall record in Amherst for the week of June 19 is as follows: June 19 - .44"; June 20 - 1.12"; June 21 - .19"; June 22 - .05"; June 24 - 1.84"; Total - 3.64". Here we have almost as much rainfall over a six day period as we normally get in a whole month, and with uncounted hours of wet foliage it is easy to imagine the amount of scab infection which probably occurred in unsprayed McIntosh trees.

WHAT A BEE EATS. Bees need about 12 times their own weight in food in a year, just as humans do. For example, a man in the army, weighing 150 to 175 pounds, eats about a ton of food in a year. A ten-pound colony of bees needs 60 pounds of honey and four or five combs of pollen stored in the hive to carry it through the winter. (from The Furrow)

SPLIT FERTILIZER APPLICATIONS. That this is not a new idea is shown by the following quotation from Jethro Tull, written in 1731: "There's no doubt but that one-third part of the nourishment raised by dung and tillage given to plants or corn at many proper seasons and apportioned to the different times of their exigencies will be of more benefit to the crop than the whole apply'd as it commonly is only at the time of sowing."

FRUIT AND NUT CROP PROSPECTS (June 1)

| | Ave. 1934-42 | 1943 | 1944 |
|---|---|---|---|
| Apples - Mass. | 72% | 68% | 71% |
| U.S.(35 states) | 65 | 62 | 72 |

June 1 conditions indicate that deciduous fruit production in 1944 may be more than 1943 by as much as 22% and about 7% above average, the U.S. Department of Agriculture reports. The peach crop is indicated to be 17% above average and about 60% more than the short 1943 crop. Pear production is indicated 3% below average. Cherry prospects are 27% above average and 69% above the short 1943 crop. Sweet cherry production is estimated about 10% above last year and sour cherry production is expected to be more than $2\frac{1}{2}$ times the short 1943 crop. Commercial apple production is indicated to be somewhat larger than the crop harvested in 1943. Grape production prospects are for larger crops in the eastern states but it is not expected that the California crop will be as large as the record 1943 harvest, although conditions are again favorable in that state. The apricot crop is indicated to be more than three times the 1943 record small crop and about one-third above average. California plums show a 5% decline from 1943. The California prune crop is short with production indicated about 21% below last year. Condition of California almonds is above average and above June 1, 1943. The California walnut crop is indicated slightly larger than last year's production. Prospects for filberts in Oregon and Washington, and for pecans in the important Southern states, are favorable at this time.

Citrus production from the bloom of 1943 (marketings from the fall of 1943 to the fall of 1944) is a record crop, exceeding the previous season by about 12 percent. Present prospects for citrus fruits from the bloom of 1944 (for marketing from the fall of 1944 to the fall of 1945) are favorable. (USDA. BAE Crop Reporting Board).

ORCHARD SITES AS RELATED TO THE FREEZE OF MAY 19

Whether the actual crop reduction in Massachusetts orchards, as a result of the recent freeze, amounts to 20, 25, or even 30 per cent, is something which will not be definitely settled until harvest time. It may run as high as 25 per cent. But this one thing is emphasized over and over again as we visit damaged orchards. The amount of damage is quite closely related to the air drainage and that, of course, has to do with the elevation of a particular block of trees with respect to the immediately surrounding country. Orchards in frost pockets fared badly. Orchards with good air drainage show, on the whole, very little damage. And so as we look back at the severe freeze of May 19 we ought also to look ahead and give serious consideration to the site of our next orchard. However serious the damage this year may have been in a particular orchard, the frost will not be without some benefit if it results in a better location of our future orchards.

DOES ANYBODY READ FRUIT NOTES? This incident provides a partial answer. On a recent visit to a good fruit grower in Norfolk County we found him seated in his truck about 10 feet from his mailbox reading - of all things - Fruit Notes.

## SUMMER DN BURNS OUT SCAB SPOTS

Apparently little has been published about the fungicidal properties of Summer DN (DN-111). Judging, however, from its chemical relationship to Elgetol, one would suspect that if applied at sufficient concentration it might possess some eradicative, if not perhaps even some protective, properties against such diseases as apple scab. Recent experience with this material in one of the College orchards indicates that when applied at the summer concentration for red mite control, it possesses considerable eradicative properties for scab spots on McIntosh foliage.

In the afternoon of June 16, two McIntosh trees that had not been sprayed previously this season received an application of DN-111 (1.4 gals. in 100). Other trees in the same block were sprayed with the same solution to which lead arsenate was added at the rate of 4 lbs. in 100 gals. At the time of the applications, the latter trees showed 18% of the terminal shoots with light scab infection, while the unsprayed trees had 50% and 70% respectively of their terminals infected. The temperature ranged from 83° to 85° F. and the humidity was high. In the early forenoon of June 19, practically every scab spot on all of the sprayed trees where the leaves were thoroughly wet by the sprays appeared to be burned out. The leaf tissue was brown and dead clear through the leaf. There was no visible injury to the leaves themselves except at the scab spots.

Based on a macroscopical examination only, the eradicant action of the sprays appeared to be more uniform and complete and with less leaf injury than is ordinarily obtainable with a spray of liquid lime-sulfur (2 gals. in 100). However, it is a bit early to pass judgment on the question of foliage injury since less than three days had elapsed after the treatments were made. If DN-111 spray at the summer concentration for red mite control should prove consistent and reliable as an eradicant for scab spots on the foliage, its use in scabby orchards would indeed be valuable aside from its effect on the red mite population.

-- O. C. Boyd

## MORE ON BLOSSOM THINNING SPRAYS

We are looking for reports from growers who tried caustic sprays at blossoming time for thinning apples or other fruits. We tried this method on Wealthy, Duchess, and McIntosh, also on several varieties of peaches, using concentrations of from 1 to 3 pints of Elgetol in 100 gallons. A comparison is being made of one and two applications, and times of application as related to the development of the blossoms. It is too early to draw final conclusions, but some preliminary statements may be ventured. A spray of 2 pints in 100 gallons took off all or nearly all the fruits on moderately vigorous McIntosh. Duchess trees were sprayed once, 2 pints in 100 gallons, on either May 9, May 11, or May 12. All sprays were more or less successful. The spray on May 11, when practically all spur flowers were open and a few petals were falling, gave the best results. These trees need little or no further thinning. Similar treatment on Wealthy on the same dates, when the flowers were less advanced, apparently show no results from the early spray and only partial thinning from the medium and late sprays.

Concentrations of from 1 to 3 pints in 100 gallons applied once or twice on Wealthy in another orchard gave varied results. The first spray was applied on May 12 and the second (when used) on May 15. Only the double spray, 2 pints in 100 gallons, seems to have thinned the fruits effectively. The weaker and the single sprays seem to have had some effect on the weaker trees which were somewhat lacking in nitrogen. Nearly all sprays were less effective on the more vigorous trees which have been heavily mulched.

These preliminary statements suggest that McIntosh is easily thinned while Wealthy requires severe treatment, especially when the trees are vigorous and high in nitrogen. Duchess takes an intermediate position. Perhaps we should use strong or double sprays on trees known to have the habit of setting heavily, and weaker sprays on trees known to set only moderately.

Injury to the trees was less than expected. Measured by what we would expect from pesticide sprays, it was rather severe, but the trees now look all right and perhaps the spray injury weakened the trees less than would the setting of an excessive crop. All these trees (except the McIntosh) have been distinctly biennial. Whether any of them will set a crop next year remains to be seen.

Sprays of 1 and 2 pints in 100 gallons applied to peach trees in full bloom were only partially effective. All trees required further hand thinning. These trees showed little injury.

-- J. K. Shaw

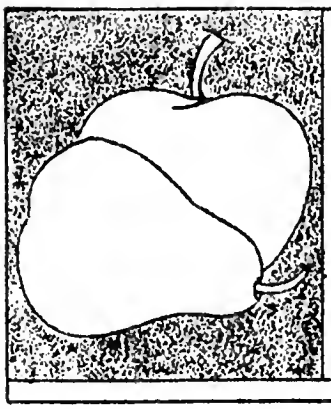
## FIRST YEAR TRAINING OF GRAPE VINES

A recent bulletin from Ontario describes a new method of training a young grape vine which results in a straighter trunk and may hasten fruiting. A twine is tied to a side stub on the newly set vine, the other end of the twine being tied to the top wire of the trellis. Only one shoot is allowed to grow and no lateral shoots are allowed to develop on it. As this shoot grows it is twisted loosely about the twine, two or three times during the season. When the cane reaches the top wire it is cut off and tied. If the cane does not reach the top wire by the end of the first season it should be cut off above the lower wire and tied to it. Nothing is to be gained in pruning a vigorous vine back to two buds at the beginning of the second season as was formerly practiced.

A word of caution is necessary on tying the lower end of the twine to the vine - be sure it is not attached to the main trunk below the shoot lest girdling result, If the trellis is not to be erected the first year a tall stake will suffice in place of the twine, in which case the growing shoot should be tied to the stake.

-- A. P. French

UNSCRAMBLING PLUM VARIETIES. A new bulletin,(No. 413), "The Identification of Plum Varieties From Non-Bearing Trees" by Lawrence Southwick and A. P. French is just off the press. It is well illustrated and will help to accomplish for plum varieties what has already been accomplished through nursery certification of apple varieties.



# Fruit Notes

July 31, 1944

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

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## THE APPLE MAGGOT AND THE BLUEBERRY MAGGOT ARE THE SAME -- ONLY DIFFERENT

In comparing the apple maggot with the blueberry maggot, we find a brilliant example of "a gray horse of another color."

The apple maggot has long been widely known as a destructive pest through eastern apple growing sections from Nova Scotia to Massachusetts, New York, and Pennsylvania. In Maine, it was a live subject of discussion in the State Pomological Society as early as 1882. Probably it was known in Massachusetts at an even earlier date.

Although infestation in blueberries had been observed on wild land

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for many years, it was not until 1906 that the late Dr. W. E. Britton, while State Entomologist of Connecticut, showed that the insect attacking blueberries is the same species as the "railroad worm" in apples. During more recent years a number of careful studies have been made of both the apple maggot and the blueberry maggot. A. D. Pickett and M. E. Neary, working in Nova Scotia, have shown very clearly some of the relationships between the two pests.

The apple maggot attacks apples and thorn apples (Crataegus spp.). The blueberry maggot attacks blueberries, huckleberries, snowberries, June berries, and a number of other berries. The apple maggot is larger than the blueberry maggot in every stage (egg, maggot, pupa, and fly), but, except for size, the two pests are as nearly alike as identical twins. The interesting observation is that the apple maggot can be forced to attack blueberries, and the blueberry maggot can be forced to attack apples. Apparently in nature, however, the apple maggot does not attack blueberries, and the blueberry maggot does not attack apples. In experiments conducted in Washington County, Maine, very young maggots were transferred from blueberries to apples, and others were transferred from apples to blueberries. After the transfer to apples, normal, small-sized blueberry flies were produced, just as when the maggots fed upon blueberries. In the blueberries, the apple maggots developed to their normal, large size, but a single blueberry did not furnish sufficient food for an apple maggot. An additional blueberry was provided to enable the apple maggot to complete its development.

Does this show a stage in the evolution of two separate species? Who knows? Perhaps some entomologist in the future can answer the question. (F. H. Lathrop, Maine Agr'l. Exp. Sta.)

## SEEN IN THE FIELD

Gangplank for Bees. For transferring a swarm of bees to a new hive Frank Foskett of Orange is using a sort of glorified gangplank consisting of a box, somewhat smaller than an apple box, with large holes bored in all sides, attached to the end of a long pole. When this device is placed alongside of a swarm of bees on a branch, they more or less promptly go aboard and the owner carries them (at a safe distance) to their new home. This contraption may not be new although it is the first time the writer has seen it. Mr. Foskett rates recognition in the Gadget Department.

Duster on a Skid. For his ingenuity in solving a thorny problem, the Cactus Corsage goes this month to Roger Peck of Shelburne. In the midst of a dusting operation a few weeks ago, a broken axle on a trailer supporting the duster gave way, and put one wheel out of commission. Instead of going fishing that day, Roger corralled a nearby fence post which he attached firmly as a skid on the disabled side, and in a few minutes the dusting operation proceeded without further interruption. When it's dusting time in the Peck orchard a little thing like a lost wheel or two cannot be allowed to interfere.

One Gallon Instead of Ten. A few days ago an extremely poor job of controlling scab was observed in an orchard where the present operator is getting his first experience in spraying. Although he thought he had sprayed five times, the trees show very little evidence of it. On inquiry, it was found that a spray tank of material is being stretched too far. The trees are receiving about one gallon instead of the ten needed for good coverage.

Last Year's Spray Lime. Imagine using in the spray tank, hydrated lime held over from 1943. Although the spray chart specifies "freshly hydrated" lime, one grower has been demonstrating that old lime will not do the trick. Having stood for a year, the lime is now partly carbonated and is gritty enough to resemble ground limestone. Clogged nozzles and a lessened corrective effect generally result from using old hydrated lime.

Bridge Grafts Too Short. Twice in recent weeks the writer has observed failures in bridge grafting. In one instance the owner said, "I seem to have very little luck in bridge grafting." We tried to convince him that success in this venture involves much more than luck. His difficulty lay in cutting the scions too short and in failing to insert them far enough beneath the bark above and below the girdled area. If ordinary precautions are taken, including tacking the bridges in place with small flat headed nails and waxing the wound to prevent drying, at least nine out of ten of the scions should unite. A first class job of bridge grafting of a tree trunk one foot in diameter can be completed in less than an hour, and that's not a bad investment of time, on a tree which required 20 years for its development.

Frost Rings on Pears. Some peculiar looking pears have been observed in a number of orchards this season as a result of the freeze of May 19. Some Bartletts have a wide russet band extending entirely around the pear about midway between the stem and the calyx, suggesting a variety which combines Bartlett and Bosc. Maybe they'll rate a special market as "Fancy" pears.

Wild Morning Glory. This rank growing perennial with strong rootstocks seems to be closely associated with a pest of apple trees, the buffalo tree hopper, which lays its eggs in the wood of the terminal growth. While this pest seldom causes severe damage, many trees show badly scarred branches as a result of the deeply inserted eggs. And very often, the more wild morning glory in the tree the more scarred branches are in evidence.

White Grubs. The need for a rotation of crops in strawberry growing is well illustrated in a planting visited a few days ago. A planting which bore in 1943 was plowed under after the crop was harvested, beans were then planted, and last spring strawberry plants were again set on this particular land, instead of waiting the usual three or four years before reestablishing a strawberry bed. In this field quite a number of the plants look wilted and on digging around the roots every one of them showed a white grub. Half a dozen plants were dug up with the same result. This suggests the need for growing two or more crops between crops of strawberries, for the purpose of eliminating white grubs. There are, of course, other reasons for a rotation, among them the destruction of weeds, increasing fertility, and adding organic matter.

New Raspberry Seedling. A few years ago a raspberry plant, apparently a seedling, grew up in the flower garden on the farm of Arthur Lundgren, in Orange. It was transplanted, and as new canes grew, the planting was extended until now it covers an area about 30 feet square. This new unnamed variety looks promising. The fruit is large, of fairly good quality, and thus far the foliage shows no signs of mosaic.

Planting Strawberries on Run Out Land. On a Hampden County farm a particular field of excellent soil type shows evidence of continued crop removal with little, if anything, put back. Fifty years or more of "mining" has left this field in an impoverished condition. None of the ordinary grasses are in evidence and the scanty weed growth consists mainly of acid tolerant plants. The previous owner had continued to plow and cultivate until it may have been necessary to "prime the hayrake with last year's hay" in order to gather up the scanty crop. The present owner would like to establish a strawberry planting of half an acre or so next year, if possible. To do so successfully will mean strenuous efforts, to say the least. Briefly, these things will be needed: 2 tons of lime per acre, a heavy application of manure, or of a complete fertilizer, and a cover crop sown immediately to provide as much organic matter as possible. Even then, the chances of providing a soil good enough for strawberries next spring are very remote. It will be easier to get the land in shape for planting in 1946.

Sunburned Apples. In a Northboro orchard, quite a number of apples, amounting to perhaps 2% on some trees, show distinct sunburn. There is reason to believe that spray materials may be a factor. The trees have been well sprayed with a wettable sulfur, and in mid-summer an application of DN was made for red mite control. On the side of the apple exposed to the sun the skin has turned almost black. A combination of sulfur, DN, and strong sunlight may be the answer.

Fewer Tentiform Leaf Miners. The heavy outbreak of spotted tentiform leaf miner in eastern Massachusetts, so evident in certain orchards in 1943, seems to be on the wane. One orchard where this pest was very prevalent last year shows very few miners this summer. W. D. Whitcomb has found at least one parasite working on this insect and is of the opinion that the leaf miner may disappear from an orchard after about three years.

Gypsy Moth in a Woods Orchard. In a Connecticut Valley orchard, immediately adjacent to pine trees, we have seen one of the worst outbreaks of gypsy moths in years. For protection against this pest, it seems highly desirable to "bring an orchard out of the woods."

A Poor Combination. A combination of circumstances in one part of an orchard in the Nashoba area indicates at least three things in need of serious attention. These particular trees, on the average, look exceedingly sick. In fact, some of them are practically dead. The reasons are winter injury and mouse injury, induced by the following system of management: A heavy application of poultry manure was apparently placed around the trees, about two years ago, in late summer. As a result, the trees grew too late for their own good and suffered from winter injury. The poultry manure also caused a heavy growth of grass around the trees and that in turn encouraged

a build up in the mouse population in the heavy grass beneath the trees. To make matters still worse, the strips between the trees have been so persistently cultivated that serious erosion has occurred and only a scanty growth of grass is in evidence. We point out these three items, namely, applying poultry manure at the wrong time, failing to control mice, and long continued strip cultivation, as three reasons for an extremely poor block of trees. Fortunately, the rest of this orchard is under a much better system of management.

Soils, Good and Bad. If it were possible to place side by side two orchards visited during the past few days, we would have an object lesson worth travelling many miles to see. In the first orchard, the soil is very sandy and the trees are seriously crowded. The foliage has a sickly appearance due to lack of nitrogen and water, and the apples are failing to size up as they should. The grass turned brown during the recent dry spell. In the second orchard, conditions are the exact opposite. A fertile, retentive soil has shown no sign of drought in either the tree or the cover crop. A rank growth of grass is in evidence and the leaves on the trees are unusually large and green. Yellow Transparant trees bearing a heavy crop show many apples 2 3/4 inches in diameter. The soil and the manager are two extremely important factors in fruit growing.

Magnesium Deficiency in a Middlesex County Orchard. A few trees about 25 years of age in this orchard showed mild symptoms of magnesium deficiency in 1943. These same trees are beginning to show symptoms again and the evidence is a little more widespread than it was last year. Evidently this particular orchard is on the border line as regards magnesium deficiency. An application of epsom salts will be highly desirable. In another block on this farm where symptoms were more pronounced, an application of epsom salts has corrected the difficulty. Other striking examples of the effectiveness of this material in providing needed magnesium in apple orchards are to be found elsewhere in the state.

Rainy Day Jobs. Nailing apple boxes is one of the favorite rainy day jobs on a fruit farm. This summer we have had so few rainy days that this important task has in many cases been left undone. As we approach the harvest season, we may have more rainy days, and we certainly have more reason to survey the box situation. Spare time should be used in such jobs as nailing box shooks, repairing boxes, and if both of these tasks are completed, we might use the next rainy day in looking around for more apple boxes to take care of the extra bushels on those trees which we thought were entirely frozen out.

Hold-Over Maggot Flies. In one of the Waltham cages which housed maggots of the 1942 season only, W. D. Whitcomb has observed five flies this summer. In other words, five flies failed to come out in the summer of 1943 and have emerged after spending two winters in the ground. This behavior has been reported before, although it is interesting to have actual evidence of hold-over flies in Massachusetts.

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FIGHTING FARM FIRES

A few days ago Edwin S. Hartley, Wyben Orchards, Westfield, Mass., told of two experiences with fires in his locality. In both cases, a power sprayer of the type used for orchard spraying was used to very good advantage. Mr. Hartley was asked to jot down the facts as he recalled them. Here they are. It is just possible that someone in Massachusetts may profit from Mr. Hartley's experience:

"Last spring a brush fire broke out in a 5-year-old block in our orchards. I discovered the fire when it was quite small, but the wind was blowing and it was so very dry that three men couldn't keep up with it. I drove one-half mile to the barns on the tractor (at 18 m.p.h.) to get the sprayer and found that it had just been emptied in another part of the orchard. We took five minutes to fill the tank two-thirds full and that gave the fire good headway. On returning to the fire it was burning over an acre of ground on a hundred foot front and the brush and mulch were burning as high as fifteen feet in the air. Using a heavy duty type gun with a nozzle delivering 10 gallons per minute one could walk into the fire and smother the flames and drive the fire back into the burned area. A 12 or 14 gallon per minute nozzle would have given a heavier fog but the smaller disc was in the gun. In five minutes the fire was under control. The city fire department arrived but they realized that their equipment was hardly needed, even the regular forest fire truck, so they left in a short time. Later, the crew that was off duty appeared in the service truck to see how good a job the sprayer was doing.

"On another occasion a brush fire was burning in the Shaker Village district of Westfield when a barn caught fire, both inside and outside. A farmer who was spraying nearby was called on for assistance. He drove across fields to the barn and sprayed it, smothering the fire promptly. Some C.C.C. boys who were fighting the brush fire with knapsack sprayers emptied their sprayers into the power sprayer tank, and in fifteen minutes the barn fire was out and the house was wet down to prevent the flying sparks from setting that, too.

"For ordinary grass fires a 6 or 8 nozzle head delivering 12 or 14 gallons per minute works best. The man with the gun rides, and the driver moves along the fire line about 10 feet away. Using a power sprayer to fight fire is very fast and efficient. Several men need to follow the sprayer with bags or brooms or knapsack sprayers to put out small flare-ups and stray sparks."

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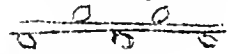
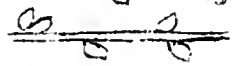
The last radio spray message of the 1944 season (Number 22) was released July 24. The objective of these messages is not so much to tell each grower just what he should do in his particular orchard, but to furnish fundamental information about the seasonal behavior of fruit pests and to provide frequent reminders at a time when he can still do something about it.

## THINNING PEACHES BY THE "CLUBBING" METHOD

Here are two reports on a new method of thinning peaches:

Carl Henry of Westboro says, "I am satisfied that the method I used saved me considerable time and money. I used a light stick about the size of a broom handle with about eight inches of rubber hose slipped over one end. I found that I could hand thin the lower branches nearly as quickly as I could with the stick. Therefore, I "clubbed" only the branches that I could not reach without the use of a ladder. It took me about a half day to get into the swing of this method. Whether I shall continue to use this method next year will depend on how the peaches look when I harvest them this fall. I don't believe any injury was done to the tree or the remaining peaches but of course you cannot select the peaches to be taken off as carefully as by the hand method. By the hand method you should get a distribution of peaches something like this:  By the clubbing method it will be more like this: 

Walter D. Weeks of the Worcester County Extension Service gave a demonstration of this method at a meeting of fruit growers in Leominster. He says, "'Club thinning' consists of knocking off the peaches with a short stick such as a broom handle. A piece of old garden hose is attached to the stick to prevent severe bruising of the peach limbs. Two such sticks, one about 18" long and one 30-40" work very well; the longer stick is used to reach the higher branches. With a little practice one can thin much faster by the 'club' method than by the conventional hand method."

## DUSTING FOR ORIENTAL FRUIT MOTH CONTROL

Oil Dusts were developed and first used for the control of Oriental Fruit Moth in Illinois in 1929. Extensive work by the Natural History Survey Division of Illinois has shown that Oil Dusts are quite effective in combatting this insect. The use of this material has become a standard practice among growers in many peach sections where Oriental Fruit Moth is apt to take its toll. Control of Oriental Fruit Moth by means of insecticides is never 100% effective, but the degree of control with Oil Dusts is sufficient to keep losses from this insect within reasonable limits.

The present material, for use just prior to the harvest season, contains the following active ingredients: Petroleum Oil - 5%, Sulfur - 57%. This dust is designed for use on peaches for control of Oriental Fruit Moth, Brown Rot, and Scab. The recommended practice involves applications at 5 day intervals, beginning 4 weeks before the fruit ripens. Thus, applications begin at an earlier date on early ripening peaches than on late ripening peaches. The objective is to maintain a light, uniform coating over the fruit during the period when the larva of the Oriental Fruit Moth is apt to make its entry. The Oil Dust may have some ovicidal properties, but it acts principally on the young larvae as they hatch from the eggs and crawl to the fruit to make their entry.

In the final analysis, the success of this material in the control

of Oriental Fruit Moth depends to a large extent on the way in which it is applied. The grower must faithfully maintain a light coating of Oil Dust in the orchard every 5 days for a period of 4 weeks before the fruit ripens. If he has a very heavy infestation to contend with, the dusting should be exceptionally thorough.

## FIXED NICOTINE FOR CODLING MOTH CONTROL

The following note concerning the use of fixed nicotine for codling moth control comes from W. E. Tomlinson of the Waltham Field Station: "Fixed nicotine is effective in controlling codling moth, but not apple maggot. Since the Fourth Cover spray is as much for maggot as codling moth control in most of our orchards, the lead arsenate must be used. These two materials can be used together so long as no lime is present in the spray, but since the lead arsenate takes care of both insects there is no advantage in using Black Leaf 155. After the Fourth Cover spray, lead should not be used because of the residue, in which case fixed nicotine is the answer."

## THE APPLE MAGGOT SITUATION

Three peaks of emergence of apple maggot flies in the Waltham cages are reported by W. D. Whitcomb: June 17 to 19, July 1 to 3, and July 17 to 19. Very few flies emerged after July 18. A larger percentage than was expected (57%) of the original 600 maggots have already appeared as flies. There are prospects of fewer migrating flies in late season for two reasons: (1) Owing to the heavy late June and early July emergence, previous arsenical applications would be likely to destroy more of the flies than in other years, and (2) Having emerged early most of the flies on unsprayed trees will have lived their normal life span before late August.

## APPLE CROP PROSPECTS

The 1944 apple crop in the U. S. has been estimated at 109,000,000 bushels. This is about half way between the bumper crop of 127,000,000 in 1942 and last year's crop of 88,000,000 bushels.

The state of Washington leads in the estimates with 24,000,000 bushels, followed by New York with 16,000,000, Virginia with 10,500,000, Michigan with 7,200,000, Pennsylvania with 7,000,000; California with 6,500,000, Ohio with 5,500,000 and West Virginia with 5,000,000 bushels. Massachusetts will have in the neighborhood of 2,000,000 bushels.

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Blightville Grower - "If a man sprays thoroughly until the first of June, he may go fishing the rest of the summer."

Bugtown Grower - "You mean if he doesn't spray thoroughly, he may as well go fishing the rest of the summer."

# Fruit Notes

August 28, 1944

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



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## "HORMONE" SPRAYING AND DUSTING FOR LESSENING PREHARVEST DROP

With the McIntosh harvest season near at hand, the following comments and suggestions concerning "Hormone" sprays and dusts may be of interest:

1. Sprays are probably somewhat more reliable than dusts, although dusts were very satisfactory in many cases last year. In our tests at Amherst, dusts have been as effective as sprays on McIntosh but not on some other varieties.

2. Apply spray or dust on McIntosh as soon as sound apples begin to drop. A second application 4 or 5 days later often enhances drop control. Two applications of either spray or dust may well be justified in many instances.

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College United States Department of Agriculture, and County Extension Services cooperating.

3. If just one application is to be used on McIntosh, it should be delayed until natural dropping is well begun (at least 6 good apples per tree per day) in order to insure protection through the harvesting period.

4. Remember that after about 10-12 days following an application, the "sticking" effect may be dissipated, resulting in heavy dropping. This is especially true with McIntosh and harvesting must be planned accordingly.

5. Spray, as nearly as possible, during the hottest part of the day. Applications are not very effective when the air temperature is below 70° F.

6. Apply dusts when air is quiet and the temperature is high.

7. Use plenty of material. Thirty gallons of spray or three pounds of dust are none too much for mature McIntosh trees. Thorough coverage is absolutely essential.

8. Use spray materials at standard strength (10 parts per million). This strength is usually recommended by the manufacturer. For increased assurance of effectiveness, use 1½ to double the standard concentration, especially when only one application is to be made. However, the standard concentration is likely to be sufficient if the spray is applied thoroughly and under favorable weather conditions, particularly as regards temperature. Do not use lower than standard strength spray.

9. If McIntosh trees show severe symptoms of magnesium deficiency, drop-control applications probably will not be effective.

10. Possible over-maturity of McIntosh is a factor to consider in utilizing "Hormone" applications as growth and development of fruits proceed as long as they remain on the tree. Hence, in the latter part of the picking season, some of the apples may be a little too mature for extended storage and should be segregated accordingly.

---Lawrence Southwick

## WAR PRISONER PROGRAM GETS UNDER WAY

A certification of need has been made for 1000 prisoners of war to assist with the apple harvest in the Nashoba area. A wage hearing was held at West Acton to determine the prevailing wage rate, which was determined to be 15 cents per bushel and 60 cents an hour at the farm.

The Nashoba Fruit Growers' Association is sponsoring this program for the apple growers in the area and they have employed Miss Eileen Draper, Groton, to look after the business details for them.

The Nashoba Fruit Growers' Association has been informed that they may proceed to make arrangements with the Commanding Officer in charge of the prisoners at Fort Devens for their use. The committee is now at work making these arrangements.

It is expected that there will be about 1000 prisoners available for the fruit growers in this area.

---Roy E. Moser

## GERMAN WAR PRISONERS IN MIDDLESEX COUNTY ORCHARDS

For the past week there have been a hundred German War Prisoners in apple orchards in Middlesex County and the same number again this week. The first month the total number of prisoners requested is small as compared with the seven hundred ordered for the picking of the Macs the first two weeks of September.

The officials at the Army Post have been most cooperative and helpful in every way and are anxious to have the program run smoothly. To date the orchardists have all furnished their own transportation but if several growers wish to combine their units for transportation purposes arrangements for a bus may be taken up with the Nashoba Fruit Growers' Association.

As far as results: the growers here reported varying numbers of bushels picked the first day from eighteen to thirty. This variation on different farms is no doubt due to the difference in supervision. These prisoners should be handled exactly as any other "green" help and to get the best results they should be carefully directed. As for the much talked about rest period the army officials do not require this; it is entirely optional with the grower.

The wages according to the contract which the Nashoba Fruit Growers' Association has drawn up between the Association and the grower are fifteen cents a bushel or sixty cents an hour. The contract requires the payment of a week's wages in advance at the rate of six dollars a day. Adjustments in these payments are made the following week between amount paid and actual work done.

All in all, to date the whole program of using prisoners of war has worked out most satisfactorily in this county.

---Ramona I. Davis
Emergency Farm Labor Assistant
Middlesex County

## APPLE HARVEST LABOR SITUATION IN WORCESTER COUNTY

With the apple harvest facing us again this year, it would be a good policy for our growers to contact pickers who worked for them last year and who were satisfactory, to estimate about how many more pickers would be needed to harvest the crop; and keep in mind to have adequate picking equipment. Last year many of the men could not use all of their pickers at one time because of a shortage of ladders and other equipment.

This year, the Nashoba Fruit Growers have appointed a labor committee who have looked into the possibility of procuring German war prisoners to help out in the harvesting. To date, it is known that German war prisoners will be available, and any growers who are interested in this type of help should contact the Nashoba Labor Committee even though they are not members.

Of course, the first step in acquiring help should be the utilization of the local talent. By this, I mean workers who live in or around the vicinity of the orchard. If then the growers are still in need of help, they should contact their Farm Labor Coordinator.

We, in Worcester County, recruited over 1,300 pickers last year which consisted of men, women and boys. This year, however, we are trying to recruit only men.

Again this year, War Ration Boards are allowing extra mileage to and from the orchards for pickers who will transport other pickers. We have forms that the grower will have to sign, stating -- that the picker is working for him, and the trips made per day covering a certain amount of mileage from city to orchard.

We are in hopes of getting British sailors to go out and pick for seven to ten days at a time. Growers who can use this help will have to board and house these men. It would be a good policy for anyone who may want the British sailors to start thinking of camps or places where they could house these men.

The growers should let the County Extension Service know their needs as to the number of pickers that will be necessary to harvest the crop, so that we may recruit sufficient help if possible.

---John A. Gatti
Emergency Farm Labor Ass't.
Worcester County

YOUTH IN AGRICULTURE

If there is any one word which we will have reason to remember for years to come, I think it is "Youth." A short while ago we felt a boy, unless he was old enough to vote, was of little value, rather limited in experience, and could not except in rare instances, be utilized efficiently. We seldom stop to think of the remarkable contribution the youngsters of today are making toward the preservation of our Country. Without "Youth," as we know it today, we could not operate our tremendously fast and efficient types of fine machinery; in the field of Industry and the newer developments, such as radar, plastics, and others, nearly all of which are carried on by our Youth.

This is equally true in Agriculture. Without our youngsters it would have been impossible to plant, grow, and harvest our record-breaking crops of the past two years. Here in our County of Hampden we have had hundreds of these youngsters doing men's jobs. Last year over two thousand different young individuals worked on our farms. There are still hundreds this year carrying on the same way. It is not uncommon to see individuals belonging to this youth mass as young as eight or ten years old driving some of our small tractors and other equipment utilized on the farms which, in some cases, cannot be operated at all by the fathers and older men.

This is also true in some of our orchards in Hampden County. Some of us take it as a matter of course to see youngsters picking and thinning apples and doing other operations around the orchard. The youngsters have taken readily to this type of work although it is a little more difficult than possibly work in the market gardens.

We can all think of plenty of youngsters who failed on the job; others,

who were fired and went back to the city, and we are inclined to comment only on this type of worker. The sincere, conscientious boy or girl is seldom given credit for what he or she may be doing, simply because we are comparing their labor with imaginery adult labor. In the aggregate, may I say the boys and girls, when considered in connection with fruit farms only, have done a commendable job. Combined with the work of others, this will have its effect on the County, State, and Nation for a long time after the individual has been forgotten. I cannot commend too highly the vast horde of youngsters for helping us older people through a very strenuous period which, I believe, we would not have been able to handle alone.

---George H. Harris
Emergency Farm Labor Ass't.
Hampden County

JAMAICANS ON THE CAPE

Despite the fact the crop will be short due to 18 per cent winter kill, a 30 per cent freeze and unusual damage by fruit worm, Cape cranberry growers have enjoyed a pleasant summer so far as labor is concerned and look forward with some assurance to the harvest season. The reason for this complacency is that they have had the services of 150 Jamaicans on their bogs this summer. They have been able to accomplish much work that might not be possible if the crop was normal or heavy.

Early in September when the berries ripen, the present force of Jamaicans will be augmented by 200 more, making 350 workers available for the harvest operation. The first contingent of 150 arrived in Plymouth June 18. They had signed up last winter at a recruiting station in Jamaica and agreed to work here until December 1. Their transportation was paid by the War Food Administration. Besides paying their wages, the growers also assume responsibility for their transportation. Quarters for these men will be Camp Manuel, Plymouth, formerly occupied by a detachment of Army engineers. Seven barracks, two mess halls, and recreation hall and infirmary are now in use. Board and room costs the Jamaicans a dollar a day.

Frank T. White, emergency farm labor assistant for Plymouth County, who has had countless arrangements to make in connection with the project, feels that things have gone along so smoothly this summer that it is almost too good to be true. Most of the Jamaicans have a high school education. Others have attended college. A number have been taking correspondence courses this summer. They are politeness itself and their speech is distinctly British. Their names have the same flavor: Everal Tylor, Vivian McFarlane, Casley Bailey and Gladstone Aitcheson. They are not fast workers but are steady and willing and do not lie down on the job. Perhaps it is enough to say that the growers would like to have them again next year.

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A new movie, in color, with many practical suggestions for inexperienced apple pickers, is now available. It may be booked through E. S. Carpenter, Extension Service, M. S. C., Amherst, Mass.

## LOOKING AHEAD IN THE FRUIT BUSINESS

Just the other day, or, in fact, early in August, when apples were selling at a pretty good price, someone said, "I suppose Maine apples are not in yet." He was thinking of the days when Maine raised and shipped many apples into Massachusetts, and eastern Massachusetts was a very small producer of apples in a commercial way. Times have changed since then, and the Massachusetts apple crop is frequently several times that of the Maine crop.

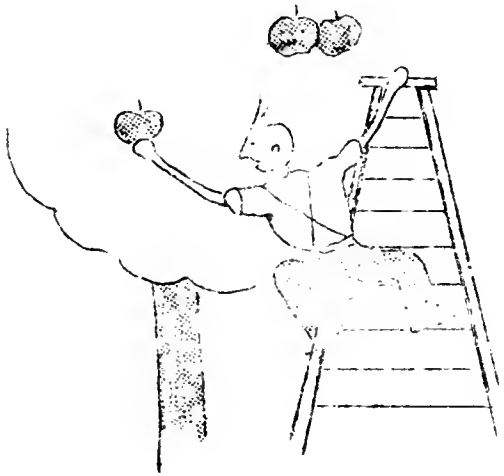
Back in 1912, there were very few commercial orchards in Massachusetts. Most of the apples were raised as a part-time, cash crop by men who had other agricultural interests. In the last thirty or thirty-five years, however, apple growing has pretty definitely drifted into the hands of professional or full-time apple growers. This has probably enhanced the quality and marketability of Massachusetts apples. Massachusetts now produces enough apples to make it an attractive buying location for large apple buyers. That makes it really a better market for all of us. I think the same thing would happen in small fruits if the advantages of quick freeze multiply the length of the selling season so that vastly more people will produce small fruits. It may be possible to grow them in Massachusetts in sufficient volume to attract buyers and to develop cooperatively a better technique in growing and selling. I hope that we will never lose our youthful spirit, whether it be small fruits or apples.

Many of us who were worrying along with young trees twenty-five years ago haven't set out many young trees in the last few years. I fear that we may be approaching a period of orcharding in Massachusetts when all the trees will be mature trees. That is the condition that occurred in Maine, for instance, before the 1934 freeze. They are now rebuilding a good horticultural business there. I hope we continue a moderate planting either of standards or some dwarf trees and continue picking a part of our crop from young trees. No one wants runaway overplanting but we should have an orderly system of young trees coming along.

---Louis A. Webster
Acting Commissioner of Agriculture

## TRAINING INEXPERIENCED APPLE PICKERS

(The following item from Seasonal Fruit Notes by H. A. Rollins, Extension Horticulturist in Connecticut, is quoted here because it is equally applicable to Massachusetts conditions.) "The lack of sufficient trained supervisors is present again this year. Dr. Bradt, State Supervisor of the Farm Labor program in New York State, stated at a recent meeting that growers often say, 'I can't take time to train this green help." A good many fruit growers will have to make use of 'green help' if their apples are harvested this year. Dr. Bradt made it very plain that we cannot just take these inexperienced apple pickers into the orchard and say, 'Here are the apples, go to it!' He explained that there were three rather important points for every fruit grower to consider in training inexperienced help. His suggestions were: (1) Obtain the confidence of your worker, put him at ease, build up his interest in the job, and get him in the right frame of mind. (2) Present the job to him, tell him what you expect without giving him too many details, show him what you want done, and remember it is all new to him. (3) Let him pick apples under your supervision; correct him if necessary and make him do it right; be sure he knows the job; check up on each picker after he has had a little experience. Tell him not to bother other pickers but go direct to the foreman with any questions."



Pick from the lower to the upper part of the tree. If the apples on the higher branches are picked first, more bruising is likely to occur because a dislodged apple tends to bruise several other apples as it drops to the ground. Pick all apples within reach, but don't reach too far. Many bones have been broken in this way. Also, the picker tires sooner and picks fewer apples. It is better to place the ladder a second time than to over-reach.


How apples get bruised. (1) By squeezing them too firmly. (2) By pulling instead of breaking them off. (3) By pressing two or more apples together in the hand. (4)By dropping or throwing them into the container. (5) By emptying into the field container instead of transferring them by hand. (6) By filling the field box too full. (7) By dropping the ladder against the apples on the tree. (8) By having fingernails too long, etc., etc.

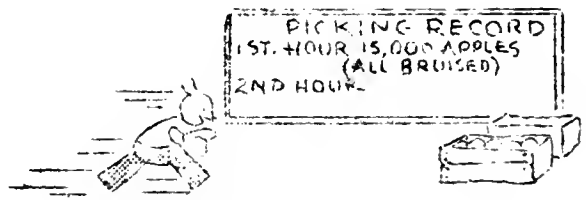
Pick apples the way the owner wants them picked. He may have ideas of his own. Follow the foreman's instructions.

W. H. Thies, Extension Horticulturist, August, 1944.

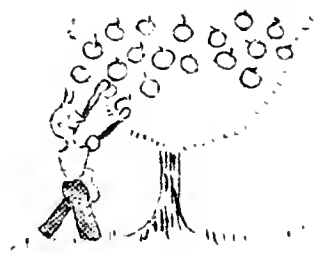
Massachusetts State College, United Stated Department of Agriculture, and County Extension Service in Agriculture and Home Economics Cooperating.

# SOME SUGGESTIONS FOR INEXPERIENCED APPLE PICKERS

Prepared by Pomology Department
Mass. State College

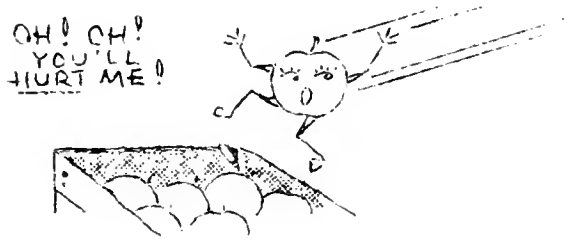



Don't try to make a record the first hour. Learn how to pick apples correctly before you try for speed. If in doubt, ask questions.



Pick apples on lower limbs first. This means placing the ladder after picking the apples which can be reached from the ground.

A McIntosh apple should be handled as carefully as an egg. Every bump means a bruise. It takes a whole growing season to develop a good apple, and less than a second to ruin it.

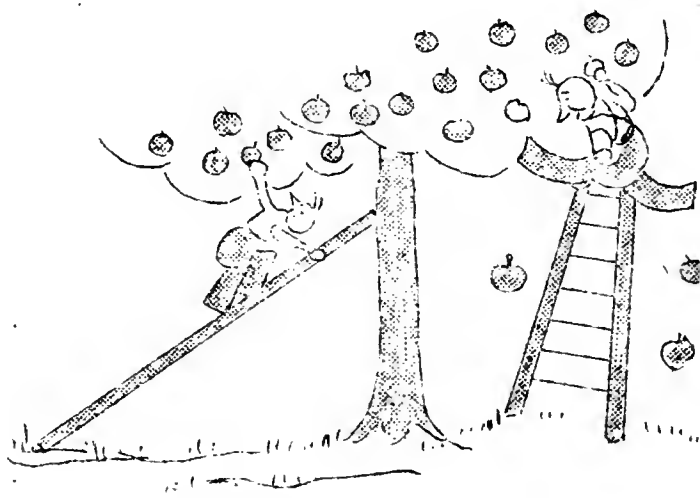



Lay the apples into the picking container. Don't throw them in Don't drop them in. Keep picking container near at hand.

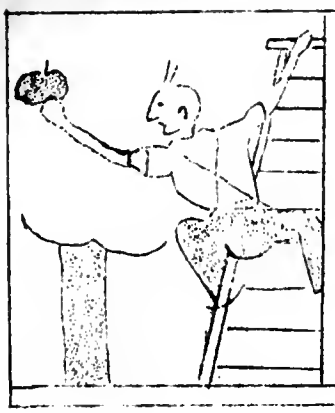


In transferring apples to a field box, do not fill above the edge of the box. Many a good apple becomes a cider apple at this point. In handling boxes of apples, don't throw them. Don't drop them.

To avoid pulling out the stem, cup the apple in the hand and tilt it upward to separate it from the spur at its point of attachment. In other words, <u>break</u> instead of <u>pull</u> the apple off. The stem is a part of the apple.



<u>Placing the ladder</u>. See that both <u>legs of the ladder</u> are firmly on the ground. Accidents often occur because the ladder is on too much of a slant. It should be leaned only slightly toward the center of the tree, or as nearly vertical as is feasible without tipping backwards. This means less strain on both the ladder and the branch on which it rests. Lay, don't drop, the ladder against the tree. The pointed type ladder may often be anchored securely against a crotch instead of laying it against the outside of the tree.



# Fruit Notes

September 30, 1944

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



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## HURRICANE APPLE PURCHASE PROGRAM

At least 150 carloads of hurricane apples will be purchased in Massachusetts. The program is now under way with headquarters at the County Extension Building in Concord (tel. Concord 202). W. P. Bauer, a representative of the War Food Administration, is in charge of this new program. Full details may be obtained from any of the county agricultural agents or from the Concord headquarters. The minimum offering is 100 bushels of one variety. Apples must conform to the U.S. Utility Grade with the exception that bruises affecting, in the aggregate, not more than 10% of the surface with no one bruise larger than an inch in diameter, will be acceptable; also, serious damage in the form of cuts or punctures will be allowed on only 15% of the apples. The tolerance for apple maggot injury is only 5% and for decay, 1%. The variety name must be stamped or written on each container. Two slats are required on corrugated covers and three slats on cardboard covers. Apples may be packed in either bushel baskets, standard bushel boxes or crates, or new fiber boxes. A minimum carload consists of 798 bushels. All apples offered to the WFA must be inspected, and inspection charges are to be paid by the vendor.

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

# Pomological Paragraphs

THE "SPEED SPRAYER". At the Pennsylvania Station the work of the new speed sprayer was compared with that of the older conventional high pressure sprayer. It was found that the speed sprayer deposited less lead in the tops of the trees but more on the bottoms, and gave somewhat less control of insects and diseases, especially with McIntosh. However, applications were made twice as fast with the same amount of labor. (Proc. A.S.H.S., Vol. 44, page 129).

FERMATE FOR CEDAR RUST. Cedar rust is not the most important disease of apple trees in Massachusetts, yet it sometimes does great damage to susceptible varieties such as Wealthy and Golden Delicious. Experiments in Virginia showed that Fermate, 1½ pounds, plus 1 pint miscible kerosene in 100 gallons controlled cedar rust on both fruit and leaves almost perfectly. It also proved superior to Bordeaux mixture in controlling bitter rot. (Proc. A.S.H.S., Vol. 44, page 107).

SULFUR SPRAYS AND GROWTH. We are changing from liquid lime sulfur to wettable sulfur largely because of a feeling that lime sulfur is injurious to the trees. The Rhode Island Experiment Station has carried on a comparison of various sulfur sprays and dusts including trees with no fungicide. After five seasons with Baldwin, the dusted trees were the larger in trunk diameter, followed by those receiving wettable sulfur and those with no fungicide. The McIntosh trees receiving wettable sulfur and dust grew best, while those with no fungicide were the smallest of all. This suggests that we may do very well if we do not spray young Baldwin trees but had better not omit scab sprays on young McIntosh. Their figures confirm the idea that liquid lime sulfur does check the growth of trees and that a 1-50 spray is worse than one of 1-100. (Proc. A.S.H.S., Vol. 44, page 99).

LEAF AREA PER FRUIT IN PLUMS. Much has been published relating to leaf area and the size and quality of the fruit. Experiments in the State of Washington showed that with two varieties of plums, at least four leaves per fruit were necessary in order to mature the fruit and to permit adequate fruit bud formation for the crop of the succeeding year. A larger number of leaves per fruit resulted in larger, better colored fruit, higher in sugar and, therefore, of better quality. It is possible that under our conditions more leaves per fruit are necessary. The regulation of leaf fruit ratio is a matter of judgment. Perhaps it is safe to say that at least 6 to 10 leaves per plum are necessary under our conditions. (Proc. A.S.H.S., Vol. 44, page 94).

EXPLODING THE SKIN FROM APPLES. Apples placed in a tight retort and heated to 240°-250° and then suddenly cooled by shutting off the steam and forcing cold water into the retort were peeled almost instantly with little waste. Potatoes were peeled and lima beans shelled by the same apparatus. A patent on the process has been applied for by the Ohio State University Research Foundation. (Proc. A.S.H.S., Vol. 44, page 190).

WAXING APPLES. One of the weaknesses of the Golden Delicious apple is its tendency to shrivel in storage. This can be largely avoided by waxing the apples. The Cornell Station describes a home-made waxing machine which could be built at a prewar cost of about $300. On this basis, apples could be waxed at a cost of about 3 cents per bushel. Weight loss was reduced about one-half. Waxing must be properly done or the apples may develop an alcoholic flavor. (Proc. A.S.H.S., Vol. 44, page 183).

A NEW REASON FOR GROWING MORE PEACHES IN MASSACHUSETTS. We sometimes wonder why some of the peaches shipped into Massachusetts should not be replaced by home-grown fruit. Peaches shipped long distances must be picked earlier than those for the local market. Peaches, like other fruits, grow as long as they are on the tree. Experiments in the State of Washington showed that increases in size and content from the time of picking Elberta peaches for shipping to the time of picking for canning were as follows: Average circumference 12%, weight 35%, soluble solids 30%. Peaches are picked for canning at about the same stage as for a local market. Peaches allowed to remain on the tree until the flesh begins to soften are more attractive in appearance, of better quality and you get more bushels. (Washington Expt. Sta., Mimeo. Circ. 8, 1943).

MORE ABOUT MULCHING ORCHARDS. Massachusetts fruit growers are interested in mulching orchards. The New Hampshire Station has started an experiment in a young McIntosh orchard comparing the common sod system of culture, sawdust, hay and seaweed mulches. After two years little difference has been observed between sod and sawdust or between hay and seaweed. Hay and seaweed have resulted in more and larger fruits of slightly less red color, and deeper green and more dense foliage than sod and sawdust. Witch grass grew up through the sawdust but only slightly through hay and not at all through seaweed. These results are similar to those of the Massachusetts Station and indicate the value of a hay mulch or seaweed if you can get it. It also suggests that sawdust is of doubtful value. (Proc. A.S.H.S., Vol. 44, page 49)

MORE PEACHES IN MASSACHUSETTS. Walter Piper says that there are practically no good peaches in the Boston market because natives are being sold at the farm. Supplies come mostly from the Virginia section. Why shouldn't we supply Boston from more Massachusetts orchards? BUT plant the trees on high sites, exterminate chokecherries, select the right varieties, control borers, brown rot, curculio, and oriental peach moth. Perhaps DDT will help in the future.

---J. K. Shaw

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MAGNESIUM DEFICIENCY. A limited number of reprints of a journal article entitled "Some Results in Correcting Magnesium Deficiency in Apple Orchards" are available to interested growers. The authors, Lawrence Southwick and J. K. Shaw, report in this article the effects of spray and soil applications of magnesium on magnesium deficient apple trees at Mass. State College. Requests for this reprint may be sent to Lawrence Southwick, M.S.C., Amherst.

## NURSERY INSPECTION

Four members of the staff of the Massachusetts State College have organized the Massachusetts Trueness-to-Name Inspection Service, sponsored by the Massachusetts Fruit Growers' Association. The members of the Service are J. K. Shaw, A. P. French, O. C. Roberts, and L. Southwick. This move implies no change in this work which has been carried on for 24 years. It only gives it a name and the expressed approval of the organized fruit growers of Massachusetts.

The work of examining nursery trees for trueness to name has been completed for 1944. Several new nurseries have been examined and a few omitted examination for this year. When a nursery has been examined for two or three years, mixtures and misnamed trees are eliminated. However, new ones soon creep in, often among buds from bearing trees. Our experience indicates that such buds are mixed quite as often as those cut in the nursery.

The examination includes apple, pear, plum, sweet cherry, and two-year sour cherry; one-year sour cherry trees of certain varieties are difficult to identify, hence, the desirability of waiting until they are older. Peach trees are examined; but, as it is difficult or impossible to identify some varieties as nursery trees, examination of peach trees is less satisfactory than that of other tree fruits. Nevertheless, a great many mixtures and misnamed peach trees are detected and corrected each year.

Bulletins describing the young trees of apple, cherry, and plum varieties have been prepared by the men of the Massachusetts Trueness-to-Name Inspection Service and are available on request to the Massachusetts Experiment Station. Bulletins on pears, blueberries, and raspberries are in preparation.

A list of the nurseries examined for trueness to name may be obtained by sending a postal card to the Department of Pomology, Massachusetts State College, Amherst, Mass.

---J. K. Shaw

## CAN YOU AFFORD TO REMOVE SOME OF YOUR TREES?

Many of our fruit growers have orchards in which the trees are too close together and find it hard to get up courage to thin them out because of fear of reduced crops. A circular from the Washington State Experiment Station gives some figures.

A Winesap orchard planted in 1905, 108 trees to the acre, was thinned to 54 trees in 1925. In 1940 one-half of the remaining trees were removed from one-half the orchard, leaving 27 trees per acre, and leaving the other half with 54 trees per acre. Detailed records of costs, yields, grades, returns and profits for the three years 1940-42 are reported. Acre yields and expenses were reduced and grades improved by thinning. The financial results vary with different methods of calculation used. A reasonable way of figuring gives the following results:

| | 1940 | | 1941 | | 1942 | |
|---|---|---|---|---|---|---|
| | Close | Open | Close | Open | Close | Open |
| Boxes per acre harvested | 794 | 502 | 972 | 697 | 1021 | 780 |
| Total expense | $602 | $359 | $714 | $494 | $695 | $528 |
| Net profit | 74 | 38 | 218 | 174 | 168 | 186 |

This table shows that net profits from the unthinned area were greater for the first two years but in the third year the acre profits were $18 per acre larger from the thinned area. (Washington Expt. Sta. Mimeo. Cir. 1)

---J. K. Shaw

TREE RIPENED FRUIT

In a test by the Illinois Experiment Station in cooperation with chain stores three types of peaches were offered for sale: (1) green ripe, (2) firm ripe, (3) tree ripe. Public preference was decidedly in favor of tree-ripened fruit even when priced 3 cents per pound above the others. 35 bushels of tree-ripened peaches were sold in the time it took to sell 4 bushels of green peaches. There was less loss of tree-ripened fruit because it moved out so much more rapidly.

This probably would apply to peaches anywhere. Would McIntosh apples sell faster in the fall months if they were ready to eat when offered for sale?

---R. A. Van Meter

"FARM HELP CAN'T TAKE IT"

"The help we get today just can't take it. Why my ten year old boy knows more about farming and can do more around my place than any two of these 'greenhorns'. I can't spend all my time showing this class of help how to do the work; if I do I won't get anything else done." These and similar remarks have been heard recently when we have been discussing the farm labor problem with Massachusetts farmers. We agree with them 100%.

In agreeing with the farmers we have neither helped nor altered the situation. We hope that we appreciate both sides of the question, the employer's and the employee's. We realize the inadequacy of this type of help, that it is not capable of taking over a particular job at first and doing it efficiently without considerable supervision. Times have changed; we can no longer go to the store and buy everything we want without bothering with rationing tickets. Neither can we stop at the gas station and say "Fill her up." In a sense farm labor is rationed and we must make the best of the supply available and use it accordingly. Yes, farmers sputter about the help problem as well as the rationing system. None of us relish the many problems which the war has forced upon us.

Soon after Pearl Harbor, Farmer Jones bought a new tractor with all the latest improvements. It was a magnificent piece of machinery. He was very careful while breaking it in and as a result has a machine that is giving him wonderful service. Likewise, a little more care in starting "green" and inexperienced help will preserve it for future use. It is not a question of seeing whether or not the new man can "stand the gaff" the first day by working him from 5 a.m. to 6 p.m. with no time out between. Break him in gradually; he will last longer and do a much better job even as the tractor did.

How does a farmer train a colt? Does he completely harness the young animal the first day and work him 10 to 12 hours plowing or harrowing? Does he expect the colt to be able to do all types of farm work without careful training? What happens if the young horse is forced to do heavy work before he is physically fit todo so? The answers to these questions are, for the most part, obvious.

Young and inexperienced help is very much like the frisky farm colt; plenty of life and enthusiasm but short on knowledge and training. In order to get the most out of either, the farmer must have patience and self control. He should take time to teach the techniques of the various jobs. He should remember that jobs which have become practically second-nature to him are entirely new to "green hands."

Suddenly transfer a dairyman, or a poultryman, or an orchardist, or a vegetable grower from his agricultural environment to the work of a radio broadcaster. Say to the farmer, "You are in charge of all the programs for the day. There are the controls, 'mike', etc. Now go to it." What would be the result? Probably disaster as far as the radio program is concerned.

No, this inexperienced farm help "can't take it" at first; neither can the tractor, nor the young colt, nor even the farmer as a broadcaster.

---R. H. Barrett

## WHAT IS DN?

One needs only to glimpse the chemistry of the so-called Dn materials to see how complex they are. It is fortunate that we can use them effectively for insect control without knowing anything about their composition. There are at least six brands on the market, some intended for dormant use, only, and some for summer use. All involve a "dinitro" radical. Hence the term DN. The following brief statement prepared by A. I. Bourne provides a little enlightenment for the chemically inclined:

DN for Dormant Use: Elgetol - A sodium salt of Dinitro ortho cresol. Active ingredients, 34%. Water, 66%. DN in oil - Dinitro-ortho-cyclo-hexyl-phenol (D-n-o-c-h-p), 4%. Oil and emulsifier, 96%. DN - D-n-o-c-h-p, 40%. Inert carrier and emulsifier, 60%.

DN for Summer Use: D-4 (dust) - Dicyclo hexylamine salt of D-n-o-c-h-p, 1.7%. DN-111 (spray) - Dicyclo hexylamine salt of D-n-o-c-h-p, 20%.

# Do You Know That:

That fresh apples from the United States will appear this winter in the United Kingdom markets for the first time since 1941? WFA officials say that every effort will be made to distribute purchases equitably between Eastern and Western producing areas. Shipments from Eastern orchards will consist of U. S. No. 1 and better grades in the 2 to 2 1/4 inch and 2 1/4 to 2 1/2 inch size groups. Purchases from the Pacific Northwest will consist of Extra Fancy and Fancy grades in the 175 to 252 (per box) size range.

That approximately 100,000 acres of orchards were sprayed with hormone materials in 1943 to prevent premature dropping? In 1940, the first year the chemical was used commercially, about 35,000 acres of apples were treated. In 1941, 50,000 acres were treated, and 75,000 to 80,000 acres were sprayed in 1942.

That more than 9 million bushels of apples will be used in the United States in 1944 in making vinegar? Proposed utilization of the 1944 apple crop is as follows:

| | | | | |
|---|---|---|---|---|
| Canned | 3,801,000 Cases | - | 5.4 | Million Bushels |
| Apple Sauce | 3,700,000 " | - | 4.5 | " " |
| Dried | 23,389 Tons | - | 7.7 | " " |
| Frozen | | - | 1.0 | " " |
| Apple Butter | | - | 3.3 | " " |
| " Jellies | | - | 1.7 | " " |
| " Juice | 800,000 Cases | - | 1.1 | " " |
| Cider | | - | 1.7 | " " |
| Vinegar | | - | 9.4 | " " |
| TOTAL PROCESSED (Civ. & Gov't.) | | - | 35.7 | |
| Remainder for Fresh use | | - | 87.9 | |
| TOTAL Apple Crop Estimate | | | 123.6 | Million Bushels |

That the first potash was imported into this country from Germany about 1870? From then until the outbreak of World War I in 1914 all of our fertilizer potash came from that country. The present annual production in this country amounts to more than 800,000 tons.

That, according to U.S.D.A. estimates, the annual crop loss from hail damage averages about $75,000,000? In 1943, 14 leading hail insurance companies paid about $3,500,000 to farmers in the United States to cover hail damage.

That sawdust does not tend to acidify the soil as much as many people suspect? It does not affect the acidity as much as it reduces the available nitrogen which it utilizes in the course of disintegration.

That cider apples are one of the chief products of Normandy? Samuel Fraser, writing about the invasion country, says, "The French specialize in growing wild crabapples to make their cider and a type of champagne from the cider. As to Normandy apples - one of the main reasons for apple growing in parts of France is to make cider, and for this reason the trees are planted as they are, Crabs, some yellow-skinned and some red. The thrifty Frenchman carefully washes out the seeds from the apple pulp and uses them for the production of apple seedlings."

That airplanes are becoming a major factor in the introduction of plant pests? The U. S. Bureau of Entomology and Plant Quarantine, in a recent report covering 13,093 airplanes arriving at 23 ports of entry last year from foreign countries, shows that 3,219 or about 25% were found to be carrying prohibited plant material, much of it from places where it is known to be the host of injurious pests. There were 681 actual interceptions of insects and plant diseases, including sweet orange scab, citrus blackfly, Mexican fruit fly, West Indian fruitfly, and Mediterranean fruitfly.

That fire blight was first discovered on wild crabapples in 1780 in the Hudson Valley? The first published recommendation in 1862 called for such things as placing sulfur around the trees. Refuse gas lime, coal ashes a nd pitch, and vinegar were also recommended. A severe outbreak of grape mildew before the Civil War resulted in the abandonment of thousands of acres in southern Ohio by 1869. Specific plant diseases have been recorded ever since Bible times.

That dry weather may affect the availability of mineral elements in the soil? Symptoms of magnesium deficiency are always more severe during a dry season. Some interesting information along this line is contained in a recent letter written by Dr. Ekblaw to John Rice. Speaking of the effect of the drouth on the apple crop, he says, "This year the crop has been so heavy and the drouth so severe, that the moisture in the upper foot or two of the soil became critical for best production. Whenever the moisture is deficient in the soil the rate of disintegration and decomposition of the minerals that yield essential plant foods is drastically diminished, and for several years there is likely to be a lag in the amount of such minerals available in the soil. Another item to be considered is the fact that certain bacteria and fungi are most numerous in the upper layers of the soil which this year have been driest, and their action both on organic and inorganic materials for plant food has been substantially reduced.

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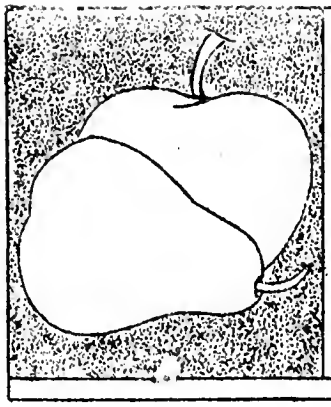
"I love the great out-of-doors; the smell of the the soil; the touch of the rain; the smile of the sun; the kiss of the wind; and the laughter of the summer breezes in the trees." (Most McIntosh growers failed to note any laughter in the breeze of September 14, and the kiss of that particular wind seemed more like a resounding smack.)



# Fruit Notes

October 31, 1944

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

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## ANCHORAGE OF APPLE TREES ON CLONAL STOCKS

We have always feared that a tendency to break off or blow down might be a weakness of trees on clonal stocks, when exposed to strong winds. The recent hurricane showed that this fear had some foundation so far as certain stocks are concerned. In a six-year-old orchard, the following percentages of trees of various varieties on the stocks indicated were broken off, or more or less tipped by the wind:

| | | | |
|---|---|---|---|
| Malling | I - 4% | Malling | IX - 21% |
| " | II - 4% | " | XII - 21% |
| " | III - 15% | " | XIII - 0 |
| " | IV - 43% | " | XV - 0 |
| " | V - 0 | " | XVI - 0 |

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

These trees were exposed to the strong northerly winds. The figures probably indicate, only in a general way, the chances of trees on these stocks being injured by high winds. Some of them can be set back without much damage. It is significant that none of the trees on the semi-dwarfing Malling V nor on any of the so-called "standard" stocks suffered injury. Malling IX is not advocated for commercial orchards, and wherever it is used in backyard plantings, we have recommended some support for the trees. We have never recommended Malling III.

It is unfortunate that trees on Malling IV suffered so badly. Many of the damaged trees were broken at the point of union, and so are a total loss. In many respects this is one of the best semi-dwarfing stocks, but if the trees are to suffer like this just when they are ready to begin to bear, it puts a black mark against this stock.

This orchard was exposed to an unusually severe test. In the 1938 hurricane our few trees on Malling IV suffered no worse than others, but they were less exposed to the wind than were the trees mentioned in this report. We need further observations before condemning Malling IV, but it looks bad for it now.

---J. K. Shaw

## BUD SPORTS OF MCINTOSH

We have growing in our experimental orchards about 20 strains or bud sports of McIntosh each propagated from a known McIntosh tree. One is from a tree of about average color, two are from trees which bore striped apples and the others are from trees selected because of real or supposed superiority of color. Seven of these strains have fruited, including the "average" strain; neither of the "striped" strains have yet fruited. There seem to be rather small differences in color. The "average" strain is a little inferior to most of the others and two of the strains seem a little superior but it will require further study before we are able to say positively which is the best. A strain of superior color may be inferior in other respects such as vigor, productiveness, etc. An experiment is under way which will show whether or not there are differences, other than color, among seven of these strains.

---J. K. Shaw

## CONTROLLING RATS AND MICE WITH METHYL BROMIDE IN APPLE COLD STORAGES

From fumigation tests with methyl bromide run last May and again during October at the Massachusetts State College in cooperation with Lawrence Southwick, Research Assistant, Pomology Department it was found that this material is very effective in killing rodents without any observable injury to, or effect on apples. Methyl bromide was tested on both mature fruit respiring relatively slowly and freshly picked fruit. A good dosage seems to be either $\frac{1}{4}$ pound per 1000 cubic feet of storage space for a 4-hour period or $\frac{1}{2}$ pound for a 2-hour period. Since methyl bromide is injurious

to all forms of animal life, proper caution should be observed when handling it. Therefore, it is inadvisable for anyone except experienced technical personnel to attempt to handle liquid methyl bromide without first having attended a demonstration in its use. The use of trapping, poisoning, and even, proofing the storage has not been entirely satisfactory because rodents are carried in with the fruit or enter the storage through doors or chutes. It is significant, therefore, that this method of exterminating destructive rodents in apple cold storages has considerable merit. Those who have a rodent problem in their storage and wish to use this material should communicate with Mr. Southwick.

---Robert M. Borg, Biologist
U. S. Fish and Wildlife Service

WHEN ARE APPLES RIPE?

Proper maturity for picking is vitally important to the apple grower, for the storage life of the fruit as well as its eating quality are greatly influenced by the stage of maturity at which it is picked. In the past, three guides have been rather extensively used: (1) Degree of yellowing; (2) firmness of the flesh; and (3) ease with which the apple may be detached from the tree. Of late years, a fourth has been taking on increased importance--elapsed time from full bloom.

Dr. Mark H. Haller, associate pomologist, Bureau of Plant Industry, Soils, and Agricultural Engineering, has recently completed an exhaustive check of these guides over a period of half a dozen years in the principal apple-growing sections of the country. He concludes that the growers have been leaning on rather frail reeds in picking-maturity guides.

The value of the yellowing or ground color guide, for example, has been considerably weakened by the increasing use of red strains that develop color before they are fully mature. Too, some of the standard varieties, under conditions favorable for red color development, color up enough to mask the ground color before the apples are fully ripe. Firmness of flesh is hardly a safe guide, Haller argues, since pressure tests indicate that the range at which maturity is reached is too great and the softening too gradual. And the accuracy of the ease-of-separating guide has been lessened by the introduction of harvest sprays to prevent fruit drop.

It appears, however, that the number of days from bloom to maturity offers a relatively safe guide. For example, the number of days from bloom to satisfactory maturity for Delicious and Starking apples was found to be about 150, regardless of whether the apples were grown in Washington, Oregon, Illinois, Ohio, Michigan, New York, or Maryland. Similar data are being obtained to show the best picking dates for the principal commercial apple varieties.

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WANTED - An orchard where trees are being removed by means of a bulldozer. We want to get some movie shots of this method of tree removal which is becoming increasingly popular in Massachusetts orchards.

## HAND POLLINATION IN ORCHARDS

It may seem foolish to propose to run the bees out of their job by pollinating apple blossoms by hand, yet this is done quite extensively in Pacific Coast orchards. Blossoms are collected at the balloon stage, allowed to dry for about 24 hours when the pollen will be mature. It is then collected in wide mouthed bottles and applied to the blossoms with a camel's hair brush. Effort is made to pollinate only one flower of one-fourth or even less of the blossom clusters. It is regarded more or less as a temporary expedient where there are not enough trees of pollinating varieties in the orchard. In some cases, hand pollination has given great increases in yield. It seems to require 1 to 2 hours to pollinate a mature tree. This mounts up to considerable expense but a bushel or two of apples per tree is ample reward. It is doubtful if this method should have wide application in Massachusetts but there may be cases of orchards which have produced light crops due to lack of pollination in which it would be worth trying. If some of our growers are interested, we will be glad to prepare directions for trying this method.

---J. K. Shaw

## SPRAYING AND DUSTING BY AIRPLANE

Imagine dusting 100 acres of orchard in an hour! This is the report from a large peach orchard in North Carolina. The results were reported as good with much more dust required than for machine dusting but the coverage was much better than with machine dusting.

The second report of protecting the orchard from the air comes from Yakima, Washington. Quoting from Better Fruit, "The plane flew three to four feet above the rows of trees which were a fourth of a mile long. Two trips were made over each row. The spraying proceeded at the rate of an acre in one and one-half minutes. The spray was 150 times as strong as that applied from the ground, and only 42 gallons were used on the 40 acres. Purpose of the application was to stop any dropping of fruit that might occur before harvest time arrived and before the fruit could be picked. The spray was atomized into a fine mist that settled all through the trees as numerous specks on the leaves and the fruit." The report goes on to say that the hormone spray applied on Bartlett pears gave excellent results. The number of drops from trees sprayed August 8 was checked August 21 to 29. During this period an average of two pears per tree dropped from the airplane sprayed trees while unsprayed trees dropped an average of 113 pears per tree.

## NOTES ON BITTER PIT

Every few days someone asks the question, "How can bitter pit or Baldwin spot be prevented?" If an answer to this question were known it would have been given wide publicity. Some recent work in New York State, however, conducted by R. M. Smock, throws some new light on this problem. His 12 point summary in Cornell Memoir 234 reads as follows:

(1) Applications of nitrogen during the growing season to trees at

a low nitrogen level apparently increased the susceptibility of apple fruits to bitter pit. Injections of urea into single limbs resulted in increased susceptibility. These nitrogen applications increased the osmotic concentration of the leaves more than they did that of the fruits. (2) Ringing seemed to markedly increase susceptibility to pitting. It increased the osmotic value of the leaves proportionally more than it did that of the fruits. (3) Defoliation was the only orchard treatment that seemed to reduce susceptibility to pitting. This treatment removed leaf-fruit competition for water. (4) Partial girdling of the fruit stems during the summer increased the susceptibility of the fruits to pitting. This treatment presumably increased the osmotic concentration of the leaves at the expense of the fruits. (5) Fruits on heavily thinned limbs and on naturally light-crop trees were more susceptible to pitting than were other fruits. These conditions also were accompanied by an increase in osmotic value of the leaves at the expense of the fruits. (6) On an unthinned limb, the lateral fruits in a cluster were more likely to pit, both on the tree and in storage, than were the terminal fruits. (7) Shading of limbs during the growing season resulted in increased susceptibility of the fruit to pitting. (8) Delayed storage is likely to result in a hastening of the appearance of bitter pit. The appearance of the disease may be significantly delayed by prompt storage. (9) Controlled-atmosphere storage delayed the appearance of bitter pit but did not reduce the final amount. (10) The use of high relative humimities in storage materially checked the rate of development of bitter pit. (11) There is a suggestion that, at least under some conditions, the use of shredded oiled paper may increase the amount of bitter pit on fruits in storage. (12) Waxing of fruits with certain emulsions seemed to materially delay the appearance of bitter pit.

## BRUSH PUSHERS

A simple device for gathering and transporting prunings in an orchard is being used successfully by several Massachusetts growers. No two brush pushers are exactly alike although the principle is always the same. In these days of labor shortages a little time spent this winter in constructing a brush pusher will return a good profit next spring. In its simplest terms, a brush pusher consists in a number of wooden teeth so arranged that they may be pushed along in front of the tractor. The construction is such that any farmer should be able to build one successfully. Here is a quotation from a recent Connecticut publication on this subject,

"The teeth of the brush pusher--which slide along just touching the ground at their front ends--slip under brush that has been thrown into the strip between two rows of trees. As the pusher moves along, brush is picked up until the teeth cannot gather or hold any more. Since the simplest brush pushers have no device to raise the teeth when a full load is accumulated, the operator must estimate how long a strip will make a load. The operator drives up a clear strip and turns into an uncleared strip at a point where he can just get a good load on his way back to the edge of the orchard. If he takes too long a strip, he will be overloaded before he gets to cleared ground. Brush is pushed out of the orchard to a location

convenient for a fire. Many operators push the brush directly into the fire and unload by backing out. CAUTION: Be sure the tractor is driven by a good operator, that it is adjusted so that the engine will not stall, and that it has a plentiful supply of fuel. One orchardist nearly lost his tractor because the engine stopped for lack of fuel just as he pushed the load of brush into the fire." (The details of construction will be furnished to any reader of Fruit Notes interested in this new gadget.)

## WOUND DRESSINGS ON APPLE TREES

Valuable time is often wasted in painting pruning wounds which are so small that they would heal readily without treatment. In other cases the material has delayed healing instead of hastening it. In U.S.D.A. Circular No. 656, J. S. Cooley reports an extensive experiment in which a number of wound dressings were used. He summarizes his findings as follows:

"The most promising of a large number of wound dressings were tested on the limbs of mature apple trees at Hood River, Oregon, and at Arlington Experiment Farm, Arlington, Va. Internodal or side wounds 25 millimeters in diameter made at monthly intervals for 2 years were treated with two waxlike dressings in comparison with white lead and linseed oil, shellac, and no treatment. One waxlike dressing (No. 541) contained eight parts by weight of rosin and three parts of sardine oil; the other (No. 540) was similar except that it contained copper soap in addition. More rapid healing took place in the transverse diameter; in the longitudinal diameter the wounds enlarged by dying even where the best dressings were used. Even at the end of the second growing season the longitudinal diameters of the wounds were larger than at the beginning.

"Wounds made in June or later produced little or no callus, in which cases enlargement due to dying took place in the transverse as well as in the longitudinal diameter. The longitudinal extension of wounds made in winter was in general greater than that of those made in the spring. The slightly injurious dressings caused less killing when applied in the spring than at any other time of the year. Shellac gave more callus formation and less dying or longitudinal extension of the wound than any other dressing used. Dressing No. 541 gave better healing in general than white lead and linseed oil or dressing No. 540. The untreated wounds gave better healing in general than those treated with white lead and linseed oil, but poorer than those treated with shellac."

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TWO IMPORTANT PEST CONTROL MEETINGS. The annual New York-New England Fruit Pest Control Conference will be held in Kingston, R. I. November 16 and 17. Research and Extension workers having to do with fruit insects and diseases will get together at that time to exchange ideas. Soon afterward the annual Massachusetts get-together will be held in Amherst at which time the various fruit spray charts will be brought up to date.

## U. S. CIVILIANS ALLOCATED 83% OF APPLE CROP

On October 19 the War Food Administration said that United States civilians have been allocated more than 103 million bushels of apples for consumption in fresh and processed form during the 12-month period ending next July. This is 83% of the estimated 125 million-bushel total supply, and 13 pounds per capita more than was available to civilians last year. More than 21 million bushels remaining, or 17% of the supply, have been allocated to the U. S. military services and to our allies and U. S. territories - 60% in processed form.

OCTOBER APPLE CROP ESTIMATES. The October U.S.D.A. Crop Report shows a slight drop in the National crop to 121,687,000 bushels compared with 122,633,000 estimated in September, 89,050,000 a year ago, and the 1934-42 average of 122,378,000. New England estimates are as follows: Maine, 844,000; New Hampshire, 832,000; Vermont, 470,000; (all unchanged from the September forecast). Massachusetts is also unchanged at 2,583,000, compared with 2,228,000 a year ago and the 2,586,000 average. Rhode Island is down from 280,000 to 268,000 in September and Connecticut has been reduced from 1,635,000 to 1,456,000.

## SAN JOSE SCALE SHOWS STARTLING INCREASE

In a number of Massachusetts orchards, particularly of the Baldwin variety, one of the most conspicuous harvest time blemishes is that caused by San Jose scale. In one instance the apples showed so many of the characteristic reddish spots as to make them scarcely recognizable. Not only was the skin plentifully peppered with reddish spots but the calyx end showed a decided crust formed by a mass of these scale insects. More apples were apparently blemished by San Jose scale this season than in any of the past 25 years. To say that San Jose scale is on the increase is a mild under-statement. The reason for the present abundance of this pest in some orchards is partially due to the fact that the use of a dormant or delayed dormant spray has quite generally gone out of style owing to the fact that a summer control of red mite is now available through the use of DN sprays or dusts. In the old days a generation or two ago many apple orchards were completely destroyed by San Jose scale. That pest brought about the common use of dormant lime sulfur and it compelled apple growers to spray thoroughly if they wished to stay in the apple business. We must now learn this lesson anew. Wherever any signs of San Jose scale appeared at harvest time plans should be made for a thorough dormant or delayed dormant spray using, not lime sulfur but one of the oils or dormant DN materials.

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AN ECHO OF THE GAY NINETIES. A few days ago an elderly man wrote to the State College to ask where London Purple might be obtained. This material was used to some extent before Paris Green, and even that has long since been discarded as an orchard insecticide.

## MEADOW MOUSE SITUATION IN MASSACHUSETTS ORCHARDS

Due to favorable weather conditions meadow mice have increased in numbers during the last month (October). In fact, in a few orchards girdling has already occurred, especially on younger trees that were loosened by the hurricane. Remember that girdling may occur even in low mouse population areas! Mice seem to have migrated from "certain" areas (stone walls, ditch banks, wet meadows, etc.) to the most favorable habitats and have established themselves. This is unusual because it was previously reported from a census study that meadow mice were scarce even in the best habitats, except in isolated spots.

It is a wise policy, therefore, for every orchardist to check his orchard now and put out poison bait wherever necessary. It is only by a thorough inspection that the degree and extent of mouse infestation can be determined. All trees affected by the hurricane should be closely examined because "pockets" usually are formed which make ideal harboring places for mice.

---Robert M. Borg, Biologist
U. S. Fish and Wildlife Service

## SERVICING THE ELECTRIC MOTOR

F. L. Rimbach, an authority on electrical equipment, asks what would happen to your apple grading operations or your refrigeration if your electric motor were to burn out. To avoid this calamity he offers these timely suggestions; (1) Blow the dust out of your motor. (2) Be sure the connections are tight. (3) Put a little oil on it occasionally (not too much, just a few drops). This is particularly important if you are running it many hours a day. (4) If you possibly can, put in a safety fuse, of a size to fit your motor. This will not cost more than a quarter. Any electrician or dealer, or your Power Company, can tell you what size to get if you simply tell them the horse power and amperage of your motor. This safety fuse should be put in a separate fuse box.

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CLONAL ROOTSTOCKS. There is a demand, far exceeding the supply, for clonal rootstocks for growing dwarf and semi-dwarf apple trees. A new bulletin (No. 418) by J. K. Shaw is now available. It tells how these stocks are grown and identified.

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The old farm-home is Mother's yet and mine,
And filled it is with plenty and to spare,-
But we are lonely here in life's decline,
Though fortune smiles around us everywhere;
We look across the gold of the harvests, as of old-
The corn, the fragrant clover, and the hay;
But most we turn our gaze as with eyes of other days,
To the orchard where the children used to play.

---James Whitcomb Riley

# FRUIT NOTES

November 27, 1944

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



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## SOME TRENDS IN THE FRUIT BUSINESS

The successful operation of a fruit farm requires long time planning. One cannot get in or out of the fruit business as easily as in the case of vegetables, poultry, or dairy. On a strawberry farm, 13 months elapse between time of planting and harvest. And if the soil needs improvement an additional year is required. In the apple business, the grower must think in terms of ten years, at least. Careful planning is needed now, in order to improve our competitive status in the post-war years. Older orchards and crowding filler trees must be removed and new blocks established.

Even though no apple trees were to be planted during the next ten years the total yield would not necessarily be reduced (assuming good care of present trees), although the cost of production would increase as the trees grow older, and a poorer grade of fruit would result. We must keep

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

our orchards relatively young if we are to maintain our favorable position among apple growing regions. In this connection the variety trend is of much interest. In 1925, about 25% of our apple crop was of the McIntosh variety. Today it is about 60%. We are becoming a "one variety state."

There is a growing tendency in the fruit business to think in terms of new equipment, new spray materials, new fertilizers, and new varieties without paying much attention to the long time aspects of the business. We are likely to stand so close to our present day problems that we fail to visualize what may happen five or ten years hence. Post-war planning is therefore of utmost importance. The fruit enterprise on every farm should be reorganized. High per acre yields of good fruit mean larger net returns.

The 1944 apple crop in Massachusetts was almost exactly the same as the 10-year average (2,583,000 bushels as compared with 2,586,000 bushels). This was about a quarter of a million bushels more than the short crop of 1943 and about a million bushels less than the bumper crop of 1942. Approximately 218,000 bushels of the 1944 crop were sold to the FSA in connection with the hurricane apple purchase program. Prices have been very favorable during both 1943 and 1944. This situation will not continue indefinitely. Fruit growers must plan accordingly.

Fruits other than apples should also receive attention. There is an excellent opportunity for the growing of more peaches provided suitable soil and site are available. The same is true of pears. The time also seems favorable for limited planting of strawberries, raspberries, and grapes to supplement other enterprises, such as vegetables or poultry. An acre of strawberries if properly handled, should yield at least 5,000 quarts. Strawberries should be considered by an occasional grower of tree fruits and by other farmers, as a supplementary enterprise.

Problems Needing Attention: (1) Removal of older blocks, and planting of suitable varieties on good sites and soils. Frosty sites and hopelessly poor soils must not be replanted. The rejuvenation of our present productive plantings is much more important and significant than the establishment of new ones. (2) Orchard crowding. Filler tree removal, or the cutting back of temporary trees, is urgently needed in many orchards. (3) Magnesium deficiency. Severe symptoms are appearing not only in apple orchards but in some peach orchards, vineyards, and raspberry plantings. Every effort should be made to distribute high magnesium lime to those farms where such deficiency appears. The use of other magnesium carriers, such as epsom salts, is also recommended where the deficiency is severe. (4) Improvement in the fruit pest control program. San Jose scale is on the increase. Red mite is causing severe damage in many orchards. Apple maggot is constantly a menace and must receive greater emphasis in 1945. Dusting as a supplement to spraying, is becoming a common practice. (5) Service to new orchard owners. Returning veterans interested in fruit growing are entitled to whatever service we can offer. They should be encouraged to contact the county extension office for practical advice. With our present knowledge of the fitness of soil types for fruit growing we can render a very valuable service to newcomers in the fruit business. (6) Diversification. On a farm concerned primarily with apples, some attention

should be given to the growing of peaches or certain small fruits. On certain other farms, one of the small fruits may provide a profitable supplementary enterprise. (7) New developments. These include spraying or dusting to control pre-harvest drop, blossom thinning with Elgetol, controlled atmosphere storage, control of rodents in storage through the use of methyl bromide, and such labor saving equipment as the brush pusher, bulldozer for removing trees, stones, and for clearing land, and the one-man power spraying outfit.

## TALE OF TWO ORCHARDS

Two farm visits in recent weeks offer proof that good pest control is possible even under the handicap of a low capacity sprayer, provided the owner uses it instead of lamenting his hard luck. Imagine an orchard of 200 mature trees and only a barrel sprayer to apply the needed spray materials! Maybe the secret lay in the fact that the new orchard owner has an energetic wife who provided the motive power on the pump handle and neither of them had been told that a barrel sprayer is a relatively ineffective piece of equipment. The facts in the case are that this man and his wife spent about three days,and laborious days at that, in applying a single spray on the 200 trees. They sprayed five times. When harvest time came they had a crop of apples of which any grower would be proud. At the time of our visit the lady who had operated the pump handle during the summer asked the question, "What does apple scab look like?" Only after an extended search were we able to find a McIntosh apple which showed a small scab spot. These people have their own reward for a season of hard work in the form of a beautiful crop of apples which has already found a ready market at good prices.

Orchard No. 2, composed mostly of McIntosh trees, has for many years shown altogether too much apple scab. The trees are fairly tall and are making very vigorous growth. Last spring the owner attended a meeting of fruit growers where he picked up an idea. Someone at the meeting stressed the importance of spraying or dusting with sulfur during or immediately before a rainy period. Previously he had supposed that sulfur would only wash off during a rain and for that reason he might as well delay spraying until after the rainy period had passed. This year he determined that he would try out a brand new system. And so instead of waiting for fair weather he got out the old sprayer, a small one at that, and used it industriously every time it rained during the month of May. The results were almost unbelievable. In spite of his tall, vigorous trees, apple scab was conspicuous by its absence. For the first time he had provided a protective covering of sulfur when it was most needed.

CORRESTION: Attention is called to a mistake in the October issue of Fruit Notes. On the 1st page under the heading "Anchorage of Apple Trees on Clonal Stocks," Malling XII should read 0% instead of 21%. In other words, this stock showed no breakage during the recent hurricane.

# Pomological Paragraphs

FIBRE APPLE BOXES. The indiana Station studied fibre apple boxes last year and the results were favorable enough to warrant further tests in 1943-44. Boxes made of so-called "Victory Board," Grade A, gave the best results; Grades B and C were less satisfactory. The Grade A boxes were of .023 caliper weatherproof sheet on either side of a .009 inch weatherproof member manufactured with weatherproof adhesives. Such packed boxes stacked 8 high stood up well from October 1 to January 3. When stacked 10 boxes high, the weight proved to be too great. The boxes were subjected to high humidity even to water poured on the floor. Massachusetts growers usually require a longer storage period and perhaps even these Grade A boxes might not stand up. (Hoosier Horticulture Vol. XXVI, page 131, October, 1944)

-- J. K. Shaw

MOVEMENT OF POTASH IN THE TREE. It has been thought that potash moves through the tree rather readily in contrast to some other nutrients that move rather slowly. At the New Jersey Station small peach trees were planted so that the upper roots of each tree were confined to one pot and the lower roots were in another pot beneath. There could be no passage of water or nutrients from one pot to another except through the root that passed through the top pot into the bottom one. Potash could be applied to either the top pot containing the upper part of the root system or to the bottom pot containing the lower part of the root system.

It was found that potash deficient parts of the plant were adequately supplied within a very few weeks by potash supplied to either pot. It should be added that the pots were filled with sand thus avoiding potash fixation which commonly occurs in field soils. This suggests that when potash is applied in the orchard, it is not necessary that it penetrate deeply but it must reach the upper roots in available form.

Probably few of our orchards suffer from potash deficiency. In attempting to correct an existing deficiency, one must beware of bringing out magnesium deficiency. If the tree has absorbing roots near the surface, it may be easier than we thought to correct potash deficiency. (Soil Science, Vol. 58, page 51, July, 1944).

-- J. K. Shaw

WAXING APPLES AGAIN. Certain varieties of apples have so little waxy covering that they shrivel in storage. Golden Delicious or Yellow Delicious is about the only such variety now grown in Massachusetts in sufficient quantity to warrant waxing. If Golden Delicious apples are waxed at the right time, with the right wax and in the right amount, shriveling may be effectively controlled. If waxing is improperly done, it may fail or the apples may be ruined. We would be glad to hear from growers who may be interested in waxing, and if there is enough demand, to get some first-hand experience and to offer suggestions.

-- J. K. Shaw

# Do You Know That:

That an injection of one of the Sulfa-drugs offers considerable promise in the control of X-disease in peach trees? Experiments now under way in Connecticut have shown startling results particularly where the material was injected in young trees previous to inoculation by budding with diseased material.

That certain new organic fungicides are apparently effective in the control of apple scab by first penetrating the plant tissues, thus preventing entrance of the fungus? This fact offers an explanation of the protection given to newly developed leaves a considerable length of time after the material was applied.

That the sale of McIntosh apples in Niagara County, New York orchards increased from 1.3% of the total crop in 1922 to 23.9% of the total crop in 1942? During this same period Baldwin sales dropped from 45.6% to 20.4% while Greenings dropped from 27.0% to 25.4%.

That the McIntosh variety has far outyielded all other varieties in the Hudson Valley? Considering trees in the 15 to 40 year class, the per acre yield of McIntosh during the period 1935-1939 was 429 bushels. Other varieties ranked as follows: Ben Davis, 266; Jonathan, 256; Rome Beauty, 249; Delicious, 217; Baldwin, 207.

That 3,000,000 pounds of apple sirup were manufactured in the United States and Canada during the first year in which this new product was produced? Apple sirup made by the present process is amber in color, very sweet, and bland. It has no distinctive flavor and its consistency is about that of an invert sugar sirup of the same solids content.

That Massachusetts placed seventh among the states east of the Rocky Mountains, and tenth among all states, in apple production in 1944?

That apple yields as high as 1000 bushels per acre have been reported in New England? Although exact yield records are not available three orchards in which the yield in a particular year amounted to at least that many bushels have been brought to our attention. We are interested in getting such records over a period of at least three consecutive years. Any grower who thinks he may qualify for the championship along that line is invited to submit the necessary figures.

That it's time to mulch the strawberry planting? No other cultural practice is likely to return a better profit than this. Mulching works miracles by providing much needed protection against deep freezing of the soil. It also keeps the berries clean and to some extent controls weeds.

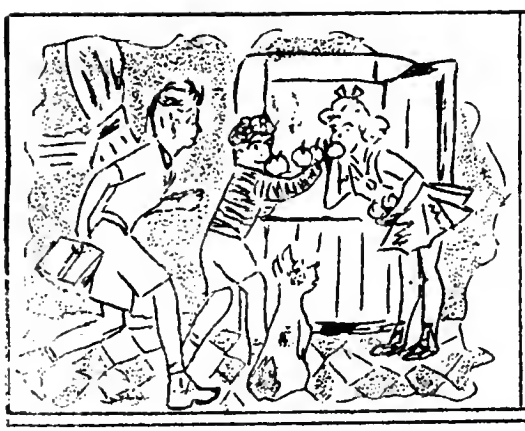
## FACTORS IN FRUIT GROWING, CONTROLLABLE OR OTHERWISE

To a very large extent the grower of tree fruits or small fruits takes what nature gives him. Yields often vary by as much as 100 per cent or more. The reasons are obvious. Many of the factors which control growth and fruitfulness are very largely beyond the grower's control. In some fruit growing regions an adequate water supply is maintained by irrigation and damage from frost is prevented by the use of heaters. Under our conditions we are likely to suffer the effects of too little rain one year and too much the next. If low temperatures occur "it's just too bad." To an even greater extent no means of preventing hurricane damage have been devised. Unfavorable weather with all of its ramifications in the form of poor pollination, actual destruction of blossoms or fruit, and greater prevalence of insects or diseases is a problem with which the fruit grower must contend in one way or another every year. The point we wish to make is briefly this: Since many factors are beyond the grower's control it is only good business to control so far as possible those other factors over which some degree of control is possible.

Of utmost importance we should mention the location of the fruit planting. Whether strawberries or apples, the fitness of the soil and site should receive consideration. With so many widely varying soil types from which to select, we ought not to handicap ourselves by setting valuable plants or trees where slight variations in soil moisture mean so much from the standpoint of yield and profit. If a soil type is so porous that it requires an inch of rain every week or if a hardpan is so near the surface as to result in water logging, the yield of fruit is certain to vary tremendously. On the other hand, a deep, well drained soil may withstand a month's drouth without seriously affecting the crop. This tends to emphasize the need for making a wise choice of soil and site. Frosty locations, in the light of a freeze like that of May 19, must not be replanted to either fruit trees or small fruits. The same is true of many other low yielding plantings which fail to come through with a crop just when prices are most favorable. In short, a fruit grower ought to cooperate with nature by doing his part so well, including selection of location, pest control, spacing, choice of varieties, etc., that even "the worst that nature can do" will still result in a profitable crop.

## A VISIT TO THE EASTERN REGIONAL RESEARCH LABORATORY IN PHILADELPHIA

It was the writer's privilege on November 1 to visit the Federal Laboratory in Philadelphia where an outstanding piece of research in "The Recovery and Utilization of Natural Apple Flavors" is underway. By an ingenious arrangement, the volatile esters in an apple are captured, distilled, and returned to the apple juice. Quoting from a recent report: "The numerous attempts made in this and other countries during the past 20 years to recover these flavors have never been completely successful, because either some of the more volatile components were lost or in the course of recovery the initial fresh flavor was inadvertently altered." This new product is a colorless solution of the volatile constituents of natural apple flavor concentrated from 100 to 150 fold. When blended with apple juice concentrate and reconstituted with water, it is indistinguishable in taste and aroma from fresh apple juice.



# FRUIT NOTES

December 30, 1944

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

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## CORRECTING MAGNESIUM DEFICIENCY IN ORCHARDS

In a Maine survey conducted last fall, magnesium deficiency symptoms were found in 47 out of 50 orchards examined. While the proportion may not be as great in Massachusetts, many of our orchards are suffering from, or are on the verge of, an actual deficiency. The natural supply of magnesium in many of our soils is low, and since continuous removal through harvested crops, leaching and erosion, tends to reduce the available magnesium below normal crop requirements, magnesium deficiency conditions become apparent on apple trees as characteristic leaf scorch. Scorching or dying of the leaf tissues usually affects irregular areas between the veins and shows up during August. Magnesium deficiency reduces tree growth and yield. Where severe, apples not only fail to size up but drop prematurely (regardless of harvest spray or dust treatment).

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Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

Two methods of treatment have been worked out, - (1) soil and (2) spray applications. With young trees, soil applications of epsom salts, kieserite, or seawater magnesia have given generally good results. With older trees, delayed response from soil applications must be expected. Spraying seems to provide quicker, but perhaps more temporary, results. The inclusion of 20 pounds of epsom salts in 100 gallons of the usual spray solution in the calyx, first cover, and second cover sprays has given considerable control of magnesium leaf scorch in the year of application. In Maine, greatly decreased scorch symptoms resulted from this treatment. Perhaps a fourth application in the third cover spray is advisable in some cases. This method of applying the magnesium in the regular spray schedule eliminates any appreciable expense of application and so far there has been no loss of effectiveness of either the magnesium or the fungicide.

Briefly, the more important suggestions for controlling magnesium deficiency in apple orchards are as follows: (1) Apply 1-2 tons per acre of high magnesium or dolomitic limestone if the soil is strongly acid (below pH 6). Limestone carrying 20% MgO is preferred. This is probably the most important means of assuring more or less permanent control. Repeated applications may be needed at intervals of possibly 5 years. (2) Apply 5-10 lbs. per tree of epsom salts, kieserite, seawater magnesia, or double sulphate of potash magnesia. In our tests, the seawater magnesia has given as good results as any material. (3) Add 20 lbs. of epsom salts to each 100 gallons of spray in the calyx, first cover, and second cover applications.

In orchards thus far free from magnesium deficiency symptoms but situated in areas where the deficiency is known to exist, a policy of prevention should be adopted. Insurance against future trouble from magnesium shortage can best be had by applying high magnesium limestone over the entire orchard area at the rate of about 1 ton per acre. Subsequent applications at intervals of 4 to 5 years may forestall the serious magnesium deficiencies now so prevalent in many commercial orchards. In any case, high calcium limestone should not be used. When ordering limestone for soil applications, be sure to designate high magnesium or dolomitic limestone. This is available through the AAA.

-- L. Southwick

## RATING OF VARIOUS APPLE VARIETIES IN THE U. S.

The Delicious variety occupies first place in our commercial orchards, the total crop of this variety amounting to 18% of the 1944 crop. The ten most important varieties ranging from 18% of the total down to 2.8% are as follows: Delicious, 18%; Winesap, 12.2%; McIntosh, 9.3%; Jonathan, 7.5%; Stayman, 6.9%; Rome Beauty, 5.5%; York Imperial, 5.4%; Yellow Newtown, 3.6%; Baldwin, 3.2%; Ben Davis and Gano, 2.8%.

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An application of borax one year in three wherever symptoms of internal cork have appeared in years past is considered excellent insurance.

THE FERTILIZER OUTLOOK

Like the supply of other civilian goods, the supply of superphosphate and nitrogen fertilizers has been reduced in the last six weeks, due to the demand for ammunition on the European war front. The supply of nitrogen fertilizers is reduced directly by this demand as nitrogen compounds are essential in the manufacture of explosives. Superphosphate supplies are reduced directly, as the sulphuric acid which is used in the manufacture of superphosphate is consumed in the manufacture of explosives. This situation might change very quickly when hostilities cease on the German front. If the war activity in Europe should increase, there might even be a further reduction in both nitrogen and superphosphate available for agricultural use.

Since the first of October, the available supply of superphosphate has been reduced from seven million tons to six and one-half million tons, on the basis of 18% superphosphate equivalent. The estimated supply had previously been reduced by one-half million tons. Consequently, at the present time, we may look forward to a supply of one million tons short of that available in 1944.

Nitrogen. It is now estimated that 93 percent of the supply of nitrogen that was available last year will be available this year. The biggest reduction comes in the supply of nitrogen solutions that are available for fertilizer mixes, and it is also expected that the quantity of ammonium nitrate will be much less. Stated in round figures and in terms of tons of nitrogen, it is expected that the supply will be equivalent to 588,000 tons, compared with 631,000 tons used in 1944.

The supply of potash, fortunately, is ample, and is estimated to be 20% above the supply that was available in 1944. This should provide ample quantities for mixed goods and use for direct application.

Mixed Goods. It is expected that there will be sufficient supplies of mixed fertilizers to meet the estimated needs for the crop season of 1945. The fertilizer industry is faced with the same type of labor difficulties that farmers face, and needs the full cooperation of their farmer customers. This cooperation can best be shown by ordering fertilizers and taking delivery as soon as possible so that the delivery season may be spread over a longer period.

The total supply of mixed fertilizers is expected to be equal to that of 1944. The increased use of fertilizers is a very important factor in the increased production accomplished in the last few years.

A record tonnage of fertilizer was used last year, and it is expected that the total use in 1945 will be only slightly less than that of 1944. Perhaps we can best visualize this by stating that it is expected that the supply of fertilizers available for use in 1945 will be 172% of the average supply used in the years 1935-1939. (Presented by S. R. Parker at Food Production Goals Conference, Amherst, December 5, 1944.)

ORDER SUPPLIES EARLY FOR 1945

War-time scarcities and war-time demands for materials during 1945 again will govern the production of farm supplies of all kinds. Industries manufacturing goods for farmers are also making military equipment. Farm supplies will be manufactured largely on a basis of advance orders. More time than usual will be needed for delivery. Again this year it is necessary to ORDER EARLY: supplies, equipment, repair parts, and materials of all kinds.

Machinery and Equipment. The total amount of new farm machinery and equipment expected to be available for the 1945 crop season for the country as a whole is approximately the same as was authorized for 1944. Distribution will be through dealers without the use of rationing certificates. It does not seem probable that the war situation will allow greater farm machinery production in time for use next year, and it is decidedly improbable that any larger amount of machinery will be available in the spring of 1945 than there was in 1944. The manufacture of farm machinery repair parts will continue at a high rate.

Take Your Fertilizer Now. War Food Administration warns "Now or Never" for assured farm supply of 1945 fertilizer. Stocks must be kept moving out now continuously to farms or the lack of manpower, transportation, and storage capacity will cause a paralyzing shortage. Unless farmers act quickly in placing their orders and are willing to accept advance delivery of materials, some cannot expect their requirements to be supplied in time for use in planting. The recent increased demand of the Army for more explosives threatens to decrease the supply of nitrogen to 95 per cent of that used last year. Only 85 per cent as much superphosphate is expected to be available. Although potash is being mined to furnish 20 per cent above last year, the slow delivery of this item from distant points of manufacture adds further problems for local mixing plants. Those who want fertilizer for crops next spring should order without delay and accept early delivery if they can secure it. This will help manufacturers to mix and deliver fertilizers steadily throughout the winter. It is our only assurance of getting fertilizer on time.

Order Spray Materials at Once. Both manufacturing and distribution of spray and dust materials will be delayed by manpower shortages, overloaded and delayed transportation, container shortage, and similar problems. The total supply of fungicides and insecticides is expected to be enough for essential needs if orders are placed early so that these needs are made known.

An adequate supply of sulfur is assured only if shipments of the finished products are continuous, not concentrated next spring and summer during the peak of consumption. France is expected to use next year large quantities of our copper sulfate. "Industry expects supplies of this material to be adequate but early shipments are essential." This year's shortage of nicotine sulfate was due to heavy foreign demands. The nicotine situation may again be critical in 1945 unless industry and War Production Board are informed ahead of time of our domestic requirements.

The following is the outlook for certain fungicides, insecticides, and weed killers: Sulfur and copper sulfate ample if bought early; copper oxide and monohydrated copper sulfate limited, tight; lead arsenate and calcium arsenate adequate; cryolite plentiful; nicotine tight, uncertain; arsenical, chlorate and sulfamate weed-killing sprays tight, limited; likewise sodium hydroxide and sodium arsenite for compounding homemade weed-killing sprays; sinox weed killer probably more plentiful; formaldehyde and mercurials probably adequate; fermate tight, limited; arasan probably adequate. Other common spray materials, seed disinfectants, as well as spreaders and stickers are expected to be adequate.

Make Plans for Boxes Now. Market boxes, and shipping containers of all kinds, are not expected to be any more plentiful than in 1944. Used orange crates and other second-hand containers are now being used for many new purposes. They may be harder to get this year than last. It is not too early now to arrange for next season's boxes.

Seeds. Supplies of legume and grass seeds, including winter cover crop seed, total 800 million pounds, approximately the same as last year. Generally speaking, supplies of red clover, timothy, redtop, blue grass, and brome grass are more than ample for 1945 requirements. On the other hand, supplies of alfalfa, alsike, white and ladino clover are relatively short. Prices again will be relatively high. Vegetable seeds are expected to be sufficient to meet needs with the exception of specific varieties of a few crops.

Fencing and Hardware. More steel for the manufacture of such articles is available than in recent war years, but fencing and farm hardware still will be hard to secure due to labor shortages in manufacturing plants. Early ordering will help in securing adequate quantities.

-- James W. Dayton

## USE OF CANNON FOR DUSTING

The following is quoted from a recent International Apple Association release: "Robert D. Glasgow and Robert Blair of the New York State Museum are experimenting in spreading insecticide dust by a small cannon and report highly promising results for certain difficult conditions. They have overcome the problem of manner of firing the charges from a row of mortars so that ample distribution is secured over the area and find that it can be used for forests and for areas where airplane dusting is hazardous. Also this reaches the tops of the trees and assures thorough coverage of all foliage. New developments in dusting give promise for certain regions. The value of bombing will be particularly appreciated when the orchards are so wet that the sprayer moves with difficulty and scab or other diseases necessitate immediate protective measures. To be able to treat 100 acres or 500 acres in an hour, even by having a limited number of mortars which can be moved into position, will assure control over situations which have been up to now serious."

H. P. Gilmore of Westboro comments as follows concerning the use of

cannon for dusting: "After the war we apple growers should apply to War Department for all the old worn out cannon. Then our dusting problems could be solved. Why not load the cannon with properly mixed fungicide and insecticide with right amount of explosive then have time fuses so set that a set of cannon would go off about once a week during the spray season? Then we growers could all enjoy ourselves off fishing. Perhaps we could find some way to reverse the process or use a vacuum and suck off all the apples at harvest time and thus save a lot of picking labor."

## A ONE-MAN SPRAYER OUTFIT

For his ingenuity in building a very successful one-man outfit for spraying a large bearing orchard, Wilson Morse of Waterford, Maine deserves recognition. The thoroughness with which he sprays his relatively tall trees is indicated by the fact that he has been able to produce for a number of years crops of apples scoring at least 90% clean with no more than three spray applications. It should be borne in mind, of course, that certain pests including curculio are not as troublesome in Maine as they are in Massachusetts. The nozzle mechanism on Mr. Morse's sprayer is suspended at the top of a pipe about 10 feet long and is so arranged that the driver is able to manipulate the "broom" in either a vertical or horizontal direction. Quoting from a recent letter, "The pump is under the tractor seat and is chain driven from a ball bearing power take-off on the front transmission. Two five-speed transmissions give us 24 different forward speeds, one of which is right for any size trees without stopping."

## SUMMARY OF WFA APPLE BUYING PROGRAM

Massachusetts growers were paid a total of $310,929.50 for hurricane apples purchased by the WFA. These apples were distributed to institutions of various kinds and through the school lunch program in a number of southern states. One carload was shipped as far west as North Dakota. Of the 218,550 bushels of apples purchased, 150,968 bushels were in Group 1 (mostly McIntosh) and 67,582 bushels were in Group 2. Prices paid for apples in these two classes were $1.50 and $1.25 per bushel, respectively. If all of these apple boxes were placed end to end, the row of boxes would reach from Amherst to Northboro, and that's a lot of apples!

## DDT NOT A CURE-ALL

The new wonder insecticide DDT shows promise for the control of codling moth, oriental fruit moth, peach tree borer, Japanese beetle, raspberry crown borer, and several species of leaf hopper, but is not promising for the control of curculio or red mite. It destroys certain predators and parasites, particularly those of the oriental moth and red mite, and also may be bad for bees. Methods of preparing it for application as a spray or dust have not been worked out nor is it yet known whether toxicity for humans may be found. Furthermore, it is not available to the general public. For these reasons it is not yet recommended to the fruit grower. (N.J. Hort. News, Vol. 25, page 1636, Nov., 1944.

-- J. K. Shaw

## NEW LIGHT ON WINTER INJURY

Some very interesting studies of tree trunk temperatures during winter are being made in Maine, by means of thermocouples. On a particular day when the air temperature was 32° F., thermocouples inserted in the cambium of the south side of an apple tree, which was exposed to the direct rays of the sun, revealed a temperature of from 60 to 64°. A similar measurement in the cambium of the south side of a peach tree indicated a temperature up to 83°. The cambium on the north side of the tree in no case showed a temperature more than 10° higher than that of the air. These measurements emphasize the tremendous absorption of heat by a dark colored surface. And when we consider the wide range in temperature of the tissues on the south side of a tree between late afternoon and evening, after the sun has set, it is easy to understand why sunscald, splitting of the bark and other forms of winter injury sometimes occur.

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One of the larger dealers in farm supplies distributed 40 tons of epsom salts among Massachusetts farmers last season, practically all of which was used in orchards as a means of correcting magnesium deficiency. A report from Maine indicates the use of 33 tons of this material by fruit growers, for the same purpose.

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## FRUIT NOTES INDEX FOR 1944



# FRUIT NOTES

January 31, 1945

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

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## RESEARCH ON MASSACHUSETTS APPLES AND APPLE PRODUCTS AT M.S.C.

An active research program concerned with Massachusetts apples and apple products was initiated in the Food Technology Department of the Massachusetts State College in 1927 and has been continued to date.

In studies on the extraction of apple juice for the manufacture of jelly it was found that Red Astrachan, Red Siberian Crab, King David, Winesap and McIntosh were among the more suitable varieties for apple jelly manufacture. A cider apple jelly has been developed which is a distinctive product of attractive color and appealing flavor, superior in quality to either apple jelly or cider jelly alone.

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

The successful canning of oven-baked, glazed, and dessert apples has been accomplished. Of twenty varieties of apples studied, among the best for canning were Northern Spy, Baldwin, Rhode Island Greening, Gravenstein, and York. The canned products are very attractive and of excellent flavor.

A method has been developed whereby New England farmers having cull apples, a cider press, and a maple syrup evaporator can make relatively large quantities of pleasing apple syrup.

Unfortunately, the juice of the McIntosh, grown in this area, has a rather insipid flavor and must be blended with the juice of other apple varieties to yield a high grade processed apple juice. It has been found that blends with Baldwin containing up to 60 per cent McIntosh apples yield a pleasing product. Much information has also been obtained and published on the manufacture of cider from Massachusetts apples.

In addition to work on apple products, research has been carried on relative to the nutritive value of apples. Data on the vitamin C content of 69 varieties of apples grown in Massachusetts have been obtained. Studies have also been made on the effect of eating apples on urinary acidity and blood alkali reserve, intestinal disorders and calcium retention.

Studies have been made on the feasibility of enriching apple juice with vitamin C (ascorbic acid). A good quality apple juice has been made from a blend of 50 per cent McIntosh and 50 per cent Baldwin apples, which had a vitamin C content equal to that of orange or grapefruit juice. During the past few years considerable interest has been shown in apple juice enriched with vitamin C, particularly in Canada.

More than twenty different articles dealing with apple products and the nutritive value of apples have been published on the work carried on in this laboratory.

-- W. B. Esselen

## CONTOURING PEACH ORCHARDS

Since peach orchards require both good soil and good air drainage, they are usually planted on more or less sloping land. Furthermore, since peaches usually do not thrive in sod, the orchards have been rather intensively cultivated. This combination of slope and cultivation has set up ideal conditions for soil erosion. In some orchards the effects are so apparent - washed out, barren, stony soil at the tops of the slopes and fine soil all at the bottom or in the next field - that one wonders why something hasn't been done about it. The remedy, of course, is contour planting.

One of the College peach orchards planted on contours has given considerable evidence of the advantages of this system. The site of this orchard had previously been used for peaches planted on the rectangular system and cultivated both ways. This had resulted in the soil in most of the orchard, particularly that at the top of the slope, becoming very

stony and very low in fertility. After the removal of this peach orchard followed by a few years of plowing in green manure crops to build up the soil, the site was again set to peaches in 1940. Contour lines were laid out with a surveyor's level, terraces built up with road machinery, and the trees set at the outer edge of the terraces. In most orchards the expense of building terraces would not be justifiable. If the trees are planted along the contour lines, cultivation will build up terraces in a few years. On very steep slopes terracing gives protection during the first few years required to build the terraces by cultivation.

Certain results of this method of planting in the College peach orchard are worth noting. First, the soil has been much improved by the cultural treatment, and this improved soil has been held in place. Second, run-off of water has been prevented thereby improving the moisture content of the soil. This has been particularly noticeable in the spring when large quantities of water were present. At times the terraces have looked like a series of rice paddies. This water has percolated into the soil instead of running off. And lastly, the growth of the trees has been improved. Following the very severe winter injury during the winter of 1942-43, the trees made an astonishing recovery. They did this in spite of a shortage of rainfall during the summer of 1943 when precipitation was considerably below normal in three of the five growing months. The conservation of moisture must have contributed greatly to this result.

Anyone planting an orchard, particularly a peach orchard, where cultivation is to be practiced would do well to consider carefully the contour system of planting.

-- J. S. Bailey

## FALL NITROGEN APPLICATIONS AND WINTER INJURY

Experiments in New Hampshire seem to show that fall applications of nitrogen rendered apple trees more susceptible to winter injury. At the Maine Station nitrogen carried in nitrate of soda, cyanamid, and manure have been applied in May, August, September, and October to bearing trees over a period of four years. No significant difference in yield or in relationship with winter injury has been found. Our experiments in Massachusetts agree with those in Maine in that there is little or no relationship between carrier or season of application and yield. We have seen winter killing which we thought was related to fall applications of sulphate of ammonia. Whether and why the difference in winter injury is a problem, perhaps climatic differences may be the reason.

-- J. K. Shaw

## HORTICULTURAL SCIENCE MEETING

Last year the New England members of the American Society for Horticultural Science held a meeting in Worcester. It was so successful that another meeting was held at the University of New Hampshire at Durham, on December 28 and 29. The attendance was good, over 40, including about a half dozen practical fruit growers. More than 20 papers were presented,

followed by lively discussions. A New England Section of the A.S.H.S. was formed with J. K. Shaw, Chairman, and H. A. Rollins, Secretary.

A. F. Yeager, reporting on conventional vs. "thin wood" pruning with McIntosh, showed little if any advantage of "thin wood" pruning. J. A. Chucka of Maine and L. Southwick agreed very well on magnesium deficiency. They recommended magnesium limestone, Epsom salts in three or four sprays and, in some cases, soil applications of magnesium salts. R. M. Borg and L. Southwick reported that fumigation with methyl bromide was effective in ridding apple storages of rats and mice. E. M. Stoddard of New Haven sent a paper reporting successful use of certain sulfur drugs in controlling the X-disease of peaches.

-- J. K. Shaw

## COVER CROP POSSIBILITIES

Domestic Rye Grass. A recent report from Michigan praises Domestic Rye Grass as a new orchard cover crop. Also known as Italian Rye Grass, it has shown promise as an over-wintering cover crop for Michigan orchards. Seeded shallow at the rate of 12 to 15 pounds per acre from August 15 to September 15, it makes enough growth to give ample soil cover for soil erosion prevention and excessive water "run-off." In the spring it resumes growth more slowly than common rye, interfering less with tree growth and cultivation. (Mich. Agr. Expt. Sta. Quart. Bul. 27, August, 1944).

Kudzu. There is some interest in the possibilities of Kudzu for Massachusetts orchards. This plant was introduced into this country from Japan more than 50 years ago. By 1941, 250,000 acres of it were planted on farms in this country. Kudzu is a rapid-growing, long-lived, leguminous, viny plant having a taproot and long stems or runners. In the more northern part of its range, the runners kill back to the crown each fall and renew growth in the spring from crown buds. Foliage is abundant and the leaves look like grape leaves. Kudzu thrives best in the humid southeastern states. It has survived in somewhat protected situations in the East as far north as New York and Massachusetts but is better adapted south of Virginia. Planting material usually consists of nursery-grown seedlings or crown plants. Relatively few plants per acre are required to obtain complete coverage. It seems doubtful that Kudzu has a place in most sections of Massachusetts, except in well-protected locations. Further information is available in U.S.D.A. Farmers' Bulletin No. 1923.

-- Lawrence Southwick

## WALNUT TOXICITY

The question of walnut toxicity dates back to Pliny, the Roman philosopher, who stated that "the shadow of walnut trees is poison to all plants within its compass" and that it kills whatever it touches, according to G. A. Gries, Conn. Agri. Expt. Sta. Today it is widely accepted that the roots of walnut trees are toxic to the roots of certain crop plants in direct contact with them. This toxicity is greatest to plants with tap root systems such as tomato and alfalfa and those with other types of deep root systems such as apple trees, rhododendrons, and privet.

The toxic component of walnuts is a chemical compound known as juglone. It is toxic to fungi and bacteria and has even been used in curing skin diseases, including ringworm. In field tests in 1943 at the Connecticut Station on the control of black spot of roses, juglone gave a degree of control equal to that of 2½ times as much 325 mesh sulfur, the standard control for this disease.

Juglone occurs definitely in the black walnut and the butternut, and probably in the English walnut. It is formed by the oxidation of hydrojuglone which is a non-toxic substance occurring in the inner bark and green husks of the nuts. When roots of other plants contact these parts, oxidation produces the toxin and the roots are injured or killed. Thus root contact is required. In some cases, the plant root systems are shallow and do not contact the deeper roots of the walnut, especially in plowed ground. Also, some plants may send out sufficient surface roots to keep them alive in spite of injury to the deeper roots. This explains why many plants are not adversely affected when grown near walnut trees. However, the fact does remain that many plants, including fruit trees, often will die or not do well in the vicinity of walnut trees. This is not a myth - it is a fact.

-- Lawrence Southwick

## RELATION OF McINTOSH DROP TO MAGNESIUM DEFICIENCY

We are just beginning to realize how low in magnesium are many of our orchard soils. This problem is not confined to the lighter soil types but may be equally severe in badly eroded soils and in other soils which are shallow because of hardpan, waterlogging or ledge. Strongly acid soil conditions, brought about by the continued use of sulfur, has further aggravated the situation. Much of the apple leaf scorch previously attributed to spray injury is now known to be due to a shortage of magnesium. Fairly liberal use of potash fertilizers in some orchards has tended to accentuate the magnesium deficiency by creating a lack of balance between potassium and magnesium. Not that potassium isn't a highly essential mineral element. But a tree might "worry along" on a low magnesium diet provided other elements were also low. As we step up the level of one element, we seem to create a demand for more of the others. A content of magnesium in the leaves amounting to at least .2% of the dry matter appears to be necessary.

Observations in Massachusetts orchards show a much greater tendency of McIntosh apples to drop from trees which are deficient in magnesium. Both leaves and apples tend to drop prematurely if the magnesium supply is very limited. It is also well known that hormone sprays and dusts fail to produce the desired results under these conditions. One Middlesex County grower who has recently corrected a magnesium deficiency, reports that last fall, for the first time, he got a definite response to the preharvest spray. Our first job as McIntosh apple growers is to restore the magnesium balance. If that is done, the McIntosh drop problem may partially disappear.

FACTORS IN ORCHARD PEST CONTROL

If a fruit grower fails to get as perfect pest control as he had hoped, the chances are that one or more of the following factors, maybe all of them, are responsible. Of these 10 factors, 6 are entirely or almost entirely the growers' responsibility, 2 are partially so, and 2 are beyond his control. Three factors have to do with the spray program, 3 with pests, and 3 with the orchard. Weather is in a class by itself.

1. Location of orchard (environment, elevation, slope, etc.)
2. Spacing of trees (crowded or scattered).
3. Condition of trees (height, spread, vigor, pruning, etc.).
4. Prevalence of individual pests.
5. Supplementary practices (drop disposal, banding, etc.)
6. Natural enemies.
7. Weather.
8. Timing of sprays and dusts.
9. Coverage.
10. Materials.

Storage Temperature and Relative Humidity. As the temperature of a storage room increases, the higher must be the relative humidity if the rate of water vapor loss from apples is not to increase. At 32°, a relative humidity of 70% is as effective in retarding the rate of water loss from apples as one of 80% at 41°.

-- Lawrence Southwick

Wartime Buying of Fruits. A study of retail sales of fruits in metropolitan markets has been made by the Department of Agricultural Economics at Cornell University. The information was furnished by a large New York City chain grocery system and covers the period July, 1941 to June, 1942. In pounds of fruit sold, oranges made up 50.6% of the total; apples, 10.9%; grapefruit, 10.3%; bananas, 7-9%; lemons, 4.2%; peaches, 4.2%. No other fruit was above 3%. Citrus fruits, as a whole, took 58 cents out of the average fruit dollar and accounted for 66% of the fruit tonnage.

-- Lawrence Southwick

Fruit Growing, a Specialized Business. Only 1/40 of the farms in the United States are classified as fruit farms. And yet these farms produce 5/6 of the fruit. This suggests the relative unimportance of the farm orchard from the standpoint of fruit production.

Correction. In the December issue of Fruit Notes, under the heading "New Light on Winter Injury," studies on tree trunk temperatures were erroneously reported as under way in Maine. This work is being conducted at the University of New Hampshire by Mr. Russell Eggert, using the new Micromax recording instrument.

PROPOSED UNITED STATES HORTICULTURAL COUNCIL

Fred A. Motz, of the Office of Foreign Agricultural Relations, has proposed the formation of a Horticultural Council which will be qualified to speak for the fruit interests of the United States.

The objectives are as follows:

"To encourage closer collaboration between appropriate government agencies and the horticultural industry. To prepare factual data, to inform, to clarify, to consult and advise with, and to make recommendations to the Secretary of Agriculture or his authorized representative in the formulation and execution of programs which affect the horticultural industry. To set up a permanent council or advisory body representative of specified commodity groups in the industry. It should be recognized by the Government as such, and the members thereof should be approved by the Government following industry nomination, selection or election.

"The council should be made up of one or more representatives from each of the commodity committees that may be established. Any eligible commodity groups desiring representation on the Council could make application to the council for membership. The council must have broad duties and responsibilities to achieve its purposes. It will be necessary for it to screen and analyze the information brought together by the commodity committees and that available from governmental sources; to consider it in terms of appropriate relationships to other food and horticultural products and to the industry as a whole; and to advise and recommend industry and Government policies and action in matters deemed necessary to solve the particular problems."

What They Write About. Thumbing through our pile of correspondence for the past month, we find inquiries on the following wide range of subjects (figures in parentheses indicate number of inquiries): Source of strawberry plants (3), raspberry plants (3), pH for raspberries, preventing decay of strawberries, growing boysenberries, grape pruning, pear pruning, source of true-to-name trees (4), source of scions (2), peach varieties, black walnut toxicity, Damson plums, fruits adapted to individual towns (4), soil testing, fertilizer program, fermate, spraying (3), apple maggot control (2), bitter pit, deer damage, brush burner, orchard heating, and requests to be placed on Fruit Notes mailing list (2).

New Apricot Developed in Russia. Soviet Russian scientists at the Samarkand Experiment Station have developed an important new type of apricot and one of apple, according to a New York Times dispatch from W. H. Lawrence, who accompanied Eric Johnston, U. S. Chamber of Commerce president, on his Russian Tour. The apricot contains 30 per cent sugar when ripe, it is said, and after ripening will dry on the tree in 10 to 12 days with a 50% sugar content, or can fall and remain on the ground a month without danger of rotting, thus saving much labor in harvesting.

FRUIT JUICE IN CANDY FORM

Following is a partial quotation from an article in the January issue of Hoosier Horticulture.

"Tremendous expansion in citrus concentrating facilities during the past year will present a serious problem for the industry after the close of the war. While there undoubtedly will be an enlarged demand for concentrated juices, it is undeniable that new markets and products must be created if virtual disaster is to be prevented. In considering the postwar possibilities for concentrated juices, several methods for appealing to the consumer come to mind. First, of course, there is the familiar method of reconstituting the concentrate and using it as a beverage, either directly or as a base for 'ades' and carbonated beverages.....

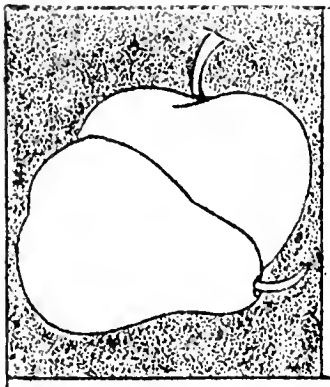
"Another method for presenting concentrated juice, which apparently up to the present time has been completely overlooked, is to consider the concentrate itself as an entity, a substance in its own right. With this conception, additional fields may be opened and wholly new markets created. For instance, it was discovered in the author's laboratory that it is possible to evaporate water from juices down to 2 per cent moisture content, and when this is done a hard candy-like substance results.....

"Successful hard tablets of concentrated juice, patent for which is now pending, have been made from grapefruit, pineapple, prune, apple, apricot, raspberry and other fruits and various combinations of two or more juices. New candy markets may be opened, postwar, by the assured surplus of these tablets."

Origin of DDT. The much publicized insecticide, DDT, the full name of which is Dichloro-Diphenyl-Trichlorobenzene, was first compounded by a young German chemist in 1874 as a routine part of preparing a thesis. No particular attention was paid to it until in 1928 when a Swiss entonological research company compounded the same material in its search for a powerful insecticide. Its first practical use was in the destruction of an unusual infestation of the Colorado Potato Beetle in 1939 in Switzerland.

A bill to prohibit the employment on farms of persons under 14 years of age is said to have been introduced in the Massachusetts Legislature. It also prohibits persons under 18 from driving a tractor without first obtaining permission from the Commission of Labor and Industries.

Orchard Crowding may be considered as Problem No. 1 in many Massachusetts orchards. It is closely associated with magnesium deficiency, pest control, and a relatively high percentage of low grade fruit.



# Fruit Notes

February 15, 1945

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

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## CONTROL OF CYCLAMEN MITE ON STRAWBERRIES

A visit to several strawberry growers last June revealed that cyclamen mite was present in serious amounts in some of the beds, but was not recognized by most growers. Because of the difficulty of controlling this pest it is not too early for growers to start planning for it now.

This mite, which is light to dark amber in color, lives over winter on the crown of the strawberry plant. It feeds mostly among the young leaves in the growing point and in the unopened flower buds. Infested plants are dwarfed, unproductive and have crumpled, deformed leaves of a bluish cast.

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

The only known control for this pest is a high temperature treatment. Plants which are to be used for setting a new bed should be immersed for 30 minutes in water held at 110° F. The water should be constantly agitated while the plants are being treated and its temperature should not vary more than one degree either way if the mites are to be killed without injury to the plants. Plants should be set as soon as possible after the treatment.

Other precautions which will help to prevent the spread of mites from the fruiting bed to the new bed include:

1. Isolating new bed 500 yards or more from other strawberries.
2. Sterilizing tools and containers which have been used in an infested bed, or allowing them to stand in open air 24 hours before using same in the new bed.
3. Not permitting anyone to go from an infested bed to the new bed the same day without washing hands, changing clothes and otherwise disinfecting themselves.

For the benefit of any who may be interested in selling plants, it is reported from California that plants may safely be shipped after treatment provided that they are cooled, dried to normal condition and packed in moist, sterile moss.

-- A. P. French

## SOME MISREPRESENTATIONS IN THE NURSERY CATALOGUES

Human nature being what it is, perhaps one should expect an uninformed public to fall for the ballyhoo of the average nursery catalogue with its beautiful color pictures (frequently of a better looking variety than what the label portrays it to be) and gross misstatements as to the merits of its offerings. Fortunately your State College has long considered the testing of varieties as one of its obligations to all who want reliable information on their behavior in this state.

The following varieties are selected for comment as a few of the more flagrant misrepresentations found in nursery catalogues today.

Concord Seedless grape - This variety is usually seedless but instead of having a large compact bunch similar to Concord - as it is usually pictured - bears a poor, scraggly bunch with berries no larger than small peas.

Caco grape - A typical bunch seldom contains more than a dozen berries in spite of the beautiful, large clusters shown in the nursery catalogues.

The much advertised August Supreme and Sweet September sweet cherries, according to George Howe of Geneva, New York, "appear to be only worthless Mazzards" as they fruit at that Station.

The high priced York Imperial sweet cherry appears to be indistinguishable in tree and fruit from Napoleon. A plant patent was granted to the York Imperial on the basis of its being self-fertile, which fact has not been scientifically established as yet.

One 1945 nursery catalogue describes the St. Regis, an old, mediocre red raspberry, as having very large berries, delicious flavor and bearing continuously from mid-June until frost. Not one of these statements is correct, but to convince the uninformed customer of the merits of this variety they show a picture of a cluster of fruits larger than Marcy, of about the color and shape of Taylor, which is mislabeled St. Regis. The price is at least twice what this old so-called everbearer is worth, even in war time.

A few other current offerings which, while they may be satisfactory in other parts of the country, have not been found to be so at the State College, include:

Golden Muscat grape, which fails to mature in our short season;
Boysenberry, which is not sufficiently winter hardy here;
Indian Summer red raspberry, which usually fails to mature its fall crop before freezing weather;
Anoka apple, which has very poor color and quality under our conditions.
The Beta grape and Hansen's Bush Cherry may be good in extremely cold climates but are of little value where the usual varieties and kinds can be grown.

The fact that a variety was originated by a famous plant breeder or that it has been granted a plant patent is no guarantee of its worth.

It would seem that it is high time for the nursery industry to take cognizance of the various experiment station reports on varieties and practice a bit of "truth in advertising" lest they kill the goose that lays the golden egg.

-- A. P. French

## A LAND-USE PLATFORM FOR ORCHARDISTS

Orchardists are generally conceded to be among the most progressive farmers; perhaps they are tops in this respect. They will doubtless subscribe to the following 3-point platform for land use, which we have proposed:

First, selective land use. This means selecting the best available soil types for a given crop. Since an orchard is a long-time crop and an expensive investment, this point is extremely important to the orchardist. Make no mistake in selecting the orchard site.

Second, soil improvement. Do whatever is necessary to improve soil productivity. It may mean the use of lime, fertilizer, manure, cover crops, or mulches; it may be the drainage of wet spots. It may be a form of land improvement such as the removal of stone walls in order to give larger and more easily managed orchards.

Third, soil conservation. Gains made in soil fertility should be held; that is the object of soil conservation. Orchards in good sod and well-mulched orchards rarely erode except in worn roadways. Contour planting of orchards often makes for easier handling of equipment, checks road erosion in sod orchards, and general erosion in cultivated orchards, and conserves moisture.

Massachusetts orchardists interested in soil and land improvement and conservation cannot afford to overlook the possibilities of the two bills on soil conservation now before the legislature of this state. Both bills offer advantages to orchardists, but an important difference is that one of the bills (H.621) provides a definite procedure for setting up local, farmer-controlled districts for soil improvement and conservation; the other bill (H.777) does not do this. H.621 gives a maximum of local control.

-- A. B. Beaumont

Terraces Hold the Water. At the Spur, Texas, Experiment Station two adjacent 10-acre fields were planted to cotton for 12 years. The fields appear nearly flat, but have a slope of six inches per hundred feet. The soils are of the same type. One field has closed, level terraces and is tilled on the contour. The other field is not terraced and is tilled up-hill. The average cotton yield from the unterraced field was 109 pounds per acre, from the terraced field 177 pounds per acre. Value of the extra yield on the terraced field was $7.60 per acre, annually. The terraced field lost no soil or water. The unterraced field lost considerable quantities of soil and 11.5 per cent of all rain.

Imagine the problem of a would-be peach grower in Essex County when the expressman delivered (on one of the coldest days last month) a peach tree which had been ordered from a southern nursery, presumably for spring planting.

## SAN JOSE SCALE

The tremendous increase of San Jose scale in Massachusetts apple orchards in 1944 is undoubtedly due (1) to favorable biological and climatic conditions, and (2) to changes in pest control practices which encourage a rapid build-up of the scale.

The San Jose scale, which hibernates as partly grown nymphs, suffers high winter mortality from low temperatures, and several times during the last ten years it has had severe set backs by freezing. Fatal winter temperatures for San Jose scale are approximately the same as for peach buds and there was little injury to either scale or peaches in the winter of 1943-44. With a high survival last spring, the abnormally warm weather throughout the summer favored maximum reproduction and survival of the young in addition to enabling the development of three or four generations instead of the usual two or three. When the young crawlers are born, they crawl over the branches for 1 or 2 days before settling on the bark, and at this time they may be spread from branch to branch or tree to tree by the wind, on the feet of birds, bees, or other large insects. Reproduction is tremendous, and it has been calculated that the progeny from a single female living in the climate of Washington, D.C. would number 3,216,080,400 by fall if all survived. Normally, parasites keep small infestations of the scale in check but the favorable growth conditions in 1944 permitted the scale to outdistance the parasites.

The most effective spray treatment to control San Jose scale is a dor-

mant application of a lubricating oil spray diluted to contain 2% or more actual oil. In the past, dormant or delayed dormant applications of oil sprays were made quite regularly, especially in orchards where the European red mite was troublesome. In recent years, oil sprays have been omitted more and more frequently, and the remarkable effectiveness of the summer type of DN sprays and dusts in controlling red mite during the growing season has encouraged this practice.

Liquid lime sulfur, even at the summer dilution 1-50, killed many young scales especially when applied at the time the young were hatching, as frequently happened when it was used in a complete scab schedule. Wettable sulfur and sulfur dust are much less effective and kill many of the predators and parasites.

Outbreaks of San Jose scale in Massachusetts have been sporadic and we may expect that the present infestation will be temporary, but it behooves every fruit grower to nip the current outbreak in the bud by applying a dormant or delayed dormant spray containing 2 or 3% actual oil in 1945.

-- W. D. Whitcomb

## WHY "FRESHLY" HYDRATED LIME FOR SPRAYING PURPOSES?

During our meetings with fruit growers, the question is frequently asked, "What is freshly hydrated lime?" or "How long can I keep spray lime and still use it with safety?" To answer these questions, let us first understand how spray limes are made and what changes they undergo when allowed to stand for some time afterward.

Manufacturers take from the quarry limestone. If agricultural lime or limestone is desired for applying to the soil, they merely grind it up finely. Chemically, limestone is Calcium Carbonate. If, instead, hydrated lime is sought for spraying purposes, they take the unground limestone and burn it. This process drives off carbon dioxide and leaves just Calcium Oxide, also known as "burnt lime," "hot lime," or "stone lime." This form of lime has a great affinity for water.

The manufacturers add water slowly to stone lime, thus slaking it. It takes up the water chemically and is then known as slaked lime or hydrated lime. Chemically, it is Calcium Hydroxide or Calcium Hydrate. It is this form of lime, and this one only, that functions in the spray tank to counteract arsenical injury and to slow up the undesirable chemical reaction between lime-sulfur and lead arsenate. It has the property of remaining well in suspension, and it is partially soluble, both of which contribute to its "safening" value.

Just as stone lime (Calcium Oxide) has a strong attraction for water, so has hydrated lime a great affinity for carbon dioxide. Just as soon as hydrated lime is exposed to the air, it begins to absorb carbon dioxide from the atmosphere. In doing so, it is changed from Calcium Hydroxide to Calcium Carbonate. In other words, the spray lime undergoes carbonation and thus eventually changes back to the original carbonate-rock or limestone which was taken from the quarry at the outset.

This carbonated lime, or limestone, is easily recognized in a bag of lime as a coarse, crumbly layer just beneath the paper container. It does not disperse well in the spray tank. It remains coarse and gritty and readily clogs the spray nozzles. In addition, it has no value whatsoever in counteracting spray injury. In fact, chemists have reported that the presence of Calcium Carbonate actually hastens the decomposition of lead arsenate into soluble arsenic. It is also perfectly inert and valueless in the preparation of Bordeaux mixture.

If freshly prepared hydrated lime is stored in air-tight containers, it should keep almost indefinitely without becoming carbonated. When stored in paper bags, it is subject to carbonation just in proportion to the extent to which the bag is exposed to the air. If bags of hydrated lime are stored in a large, closely-packed pile or stack, the outside bags will proceed to carbonate gradually while the inner ones should undergo very little carbonation even during three or four years of storage.

The principal disadvantage of using for spraying purposes hydrated lime that has carbonated slightly is the nozzle trouble and the sludge or settlings in the bottom of the tank. There still would be enough of the calcium hydrate or hydroxide present to act as "safener" if there was only a thin crust or layer of carbonated lime next to the wall of the paper bag. However, it is not always possible to determine through ordinary examination just how far the carbonated lime extends into the package, although it is generally understood that most of it will occur in the outside layer that appears coarse and grainy to the fingers.

So, by freshly hydrated lime, we mean lime that was slaked or hydrated by the manufacturer within a year of its use. As a rule, under farm storage conditions, it will undergo considerable carbonation by the end of the first season. If kept over for use the following year, it could be expected to contain an undesirable amount of carbonated lime. A chemist's analysis should reveal exactly to what extent the hydrated lime has changed to carbonate.

-- O. C. Boyd

## FARM WORK SIMPLIFICATION

Farm workers are scarce and labor is an expensive item in the cost of producing farm products in Massachusetts. It is quite probable that the farm labor shortage may continue for several years. Faced with this situation, farmers are particularly interested in ways of saving labor and in using the available supply fully and efficiently so as to keep production costs as low as possible. Also, many of the available workers are young and some will be girls and women. Farmers should therefore give considerable thought to ways of making the work as easy as possible.

Industry saves money by simplifying work. It has found that the simpler and easier each operation is made, the more production results. The principles of work simplification can be, and are being applied to farming. The object is to:

1. Plan the work to make as few jobs as possible.
2. Reduce the motions required for each job to the smallest number.
3. Organize the motions left to require the least possible energy.

A 4-Step Plan. Farm work simplification principles can be applied to any farm job in four steps.

Step 1. Break down the job into all its operations. A Job is a definite, complete piece of work such as spraying trees. An Operation is part of a job. The job of spraying might consist of these operations--hauling the sprayer to the water supply, filling the sprayer with water, adding spray materials, travel to the orchard, and applying spray.

Step 2. Analyze each operation, considering questions like these:
1. Can the operation or part of it be left out?
2. Can a substitute way be used?
3. Can two or more operations be done at the same time?
4. Can the order of the work be changed so that fewer operations would be required?
5. Can some tool, device or piece of equipment (perhaps home made) make the work easier?
6. Can extra travel be saved by planning, changing the places where tools, equipment and supplies are kept?
7. Can the operation be made easier by arranging it so both hands can help?

Step 3. Develop a new and better way for doing the job which will:
1. Eliminate unnecessary operations.
2. Combine two or more operations.
3. Change the order of the operations so that time and labor will be saved.
4. Make possible the use of some tool, equipment or device which will make the work easier.
5. Improve the arrangement of tools, equipment and supplies to save time and effort.
6. Make it possible for the left hand to do as much work as the right hand.

Step 4. Apply the new and improved way for doing the job.

In doing some types of work it may take a little time for the worker to become accustomed to the new method and he may not save much time and effort in the beginning. However, by continuing the new method he soon develops new habits. Where distances traveled are lessened by rearrangement of the order in which work is done, or by placement of tools and equipment the results are obvious.

-- Roy E. Moser

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If snow is "the poor man's mulch," as some folks claim, we're certainly wealthy in Amherst this winter. To date, according to the local Weather Bureau, we've had 44½ inches.

# Do You Know

That during the final swell, peaches increase in size at an exceedingly rapid rate? For every 40 or 50 acres the increase in production amounts to about a carload per day. --- J. S. Bailey.

That penicillin, the new wonder drug, has been used with unexpectedly good results at the Arizona Experiment Station for treatment of crown gall, sometimes called plant cancer? Crude penicillin treatment may prove valuable in nurseries and elsewhere for the cure of plants on which the tumors are within reach and possibly as a preventive of infection during budding and grafting operations.

That since 1940, total farm population in the U.S. has declined 4,700,000? There are now only 25,050,000 people on farms compared to 30,025,000 in 1940 and 32,000,000 in 1933. About 1,650,000 farm folks have gone into the Armed Service, another 4,650,000 have moved away. Births, however, have exceeded deaths by 1,526,000.

That the suffix "cide," which the dictionaries say signifies killer or destroyer, comes into increasing use as scientists find ways of combating man's pests? Fungicides, insecticides, herbicides, and rodenticides are common examples.

That the nitrogen used by crops comes from six sources? They are: (1) The nitrogen content of the soil. (2) Nitrogen fixed by legume bacteria. (3) Nitrogen fixed by non-symbiotic bacteria. (4) Nitrogen supplied by manures and crop residues. (5) Nitrogen brought down in rain and snow. (6) Commercial nitrogen. With the single exception of commercial nitrogen, the quantity of nitrogen that any crop derives from these various sources can only be estimated.

That when 1,000 apple boxes are used the second time, enough wood is saved to crate an aeroplane for shipment overseas? Metal in 60 wire-bound citrus boxes can supply the nails and straps for crating a jeep for the same journey.

That the richest source of Vitamin C of all fruits or vegetables is Black Currant juice? Its content is about three times that of citrus juices. In Massachusetts, however, the planting of black currants is prohibited because of their susceptibility to white pine blister rust.

That dried apples were a staple article of trade in early Colonial days? Farmers not only earned money for taxes by drying apples, but exchanged them at the country store for red flannel, coffee, spices and other necessities. In the lumber camps of Michigan this preserved fruit was the culinary delicacy which supplemented many a meal of potatoes, beans and salt pork.

That the first large commercial nursery in America was established by Robert Prince about 1830, at Flushing, Long Island? The Prince catalog of 1794 is said to have contained as many varieties of fruits as some of the present day nursery catalogs, apricots and nectarines being represented by 10 varieties each. The catalog of 1845 enumerated 345 varieties of apples alone.

That the Ben Davis variety, because of its splendid keeping qualities and attractive color, became known among orchardists of the Civil War period as the "mortgage lifter?" In New England, the Baldwin has performed that service on many a farm and so deserves a well earned claim to the same title.

That it was an old-time custom, observed by many people when eating an apple, to select a favorable spot and press the seeds into the ground with a turn of the boot? This may help to account for some of the millions of wild apple trees which dot the New England landscape.

That food production in the U.S. has increased fully one-quarter while the number of farms has declined one-tenth? Theodore Schultz, University of Chicago Agricultural Economist, believes that by 1950 four million farms in the U.S. will produce a third more food than did the six million farms before the war.

That the yield of apples from the Byrd orchards in Virginia in 1942 amounted to 1,200,000 bushels, or about one per cent of the U.S. crop? The Berryville Orchard, with 1500 acres and 70,000 bearing trees, produced about half of this total. The five most important varieties and the percentage of each are as follows: Delicious - 20; York - 16; Stayman - 16; Rome Beauty - 14; Winesap - 12.

That wild blackberry plants growing near peach orchards provide winter quarters for strawberry leafroller worms which in turn are hosts to the beneficial Macrocentrus ancylivorous, parasite enemy of the Oriental fruit moth? We are not yet ready to recommend encouraging the wild blackberry, however, because of other problems which might arise.

That the United States now has 5,282 frozen-food locker plants? In Iowa, which has the most, there are 580 plants. Minnesota is second with 470, and Washington State is third with 404. Last year's increase was 723 new plants, not counting additions to old ones or plants still under construction.

That Florida now has an estimated 377,450 acres of bearing citrus groves, with about 6000 acres a year of new acreage coming into bearing? Present groves consist of 251,340 acres of oranges, 95,190 of grapefruit, 23,420 of tangerines and 7500 of limes.

That the fruit juice pack for the whole U.S., including Hawaii, in 1935, was 9,317,000 cases while in 1943 it was 39,202,000 cases? The packs of the various juices were about as follows: grapefruit - 20,029,700; pineapple - 8,600,000; orange 2,702,000; other citrus juices and concentrates - 2,789,000; grape - 1,500,000; apple - 1,000,000; nectars and miscellaneous juices - 1,000,000; and prune - 450,000 cases.

That if the national apple crop were to be distributed equitably throughout the nation, every man, woman and child would receive about a bushel? With many people eating five or even ten bushels each year, it is easy to estimate how few apples others, particularly in non-apple producing sections, are consuming.

That a sweet apple is sweet not because it contains more sugar than a sour apple, but because it contains less acid? --- J. K. Shaw

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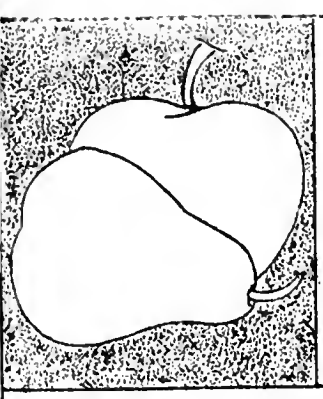
Killing Chokecherries. The sodium chlorate and more recently the ammonium sulfamate sprays for killing chokecherries and other weeds have become war casualties. Although there is hope of getting some sulfamate next spring, the supply will probably be limited at best. Therefore, growers would be wise to keep an eye on the new 2-4-D sprays. Reports indicate they are effective against chokecherries. However, they are still in the experimental stage. --- J. S. Bailey.

1945 APPLE SPRAY CHART. Proof of the new chart has been returned to the printer. This is considerably earlier than in several years past. The new charts may be ready for distribution by the time this issue of Fruit Notes is received.

Just Spray Off the Bark. An article under this heading appears in a recent issue of Food For Victory With King Apple, from Illinois. Victor W. Kelley, Extension Horticulturist, reports a new method of removing rough bark from apple trees, as follows: "Scraping off rough and loose bark in a codling moth sanitation program is a very tedious and slow process. A more efficient method is to spray it off. Use a standard spray gun with a No. 8 disc (8/64 inch aperture), and apply water at 500 pound pressure. A mature apple tree 25 to 30 years of age may be thoroughly smoothed off in four to five minutes. Small trees may be so treated in one minute or less. The procedure is simple, but certain precautions should be observed. Work about two to four feet distant from the tree trunk. Hold the gun at a 45° angle when cleaning out around the bottom of the tree, or too much of the crown will be exposed to low temperatures if spraying is done during the early winter. Adjust the gun when necessary to prevent injury to live bark.

"Spraying off the loose and rough bark has the following advantages over hand-scraping: (1) It is three to four times faster, including the time required for filling the tank and hauling, and requires only about the time of a regular spray application. (2) It is more thorough in crotches, punky areas, et cetera. (3) It destroys a high percentage of over-wintering larvae. (4) It is possible to reach higher branches. (5) No new equipment is necessary. In view of the labor shortage not many growers will be able to hand-scrape this coming year. Certainly every grower should be able to spray off the bark and be prepared to band in 1945."



# Fruit Notes

March 8, 1945

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## SHRIVELLING OF APPLES IN STORAGE

Apples shrivel when they lose from 5 to 7% of their weight in the form of water vapor. The rate of water loss from apples in an average storage is such that toward the end of the season the fruits have lost from 3 to 5%. While apples seldom shrivel in storage, there is only a small margin of safety and when displayed by retailers in a warm dry room, shrivelling occurs rapidly. The grower or storage operator has no control over conditions in the food store. He can, however, and ought to store fruits in such a manner that they lose a minimum of water by the time of sale to the retailer so that they can withstand further loss before shrivelling.

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Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

The rate of water loss depends on the nature of fruit itself and environmental conditions. The skin prevents free evaporation and is responsible for the fact that a free water surface of the same area loses 30 to 50 times as much water. The skin is not absolutely tight. Water vapor escapes through lenticels, called commonly dots, and through the cuticle between the lenticels. About 4 to 10 times as much water is lost through the cuticle as through the lenticels.

When apples are placed in storage their rate of water loss steadily decreases for some time even if they are placed under constant environmental conditions. This is due to a number of factors, chiefly to the increase of wax or bloom on the surface of the skin, to closing down of lenticels, and to dessication of the skin.

The grower has some control over natural tendencies, so far as water loss is concerned. Too early or too late picking may make the fruits more susceptible to shrivelling. Washing or brushing for spray residue removal may remove the surface wax and increase greatly the rate of water loss. It is, however, by controlling conditions during the storage period that the most satisfactory prevention of shrivelling can be accomplished. In order to keep water losses down, the temperature in the storage must be low ($31^{\circ}F$ to $32^{\circ}F$) and relative humidity high (85% to 90%).

These two conditions are being achieved by sound engineering devices and good pomological practices. The engineer provides storage with adequate coilage to remove field heat from the fruit quickly. He will also try to maintain a minimum differencial between the temperature of the refrigerant and that of the room in order to avoid taking too much moisture from the atmosphere in the form of frost deposits on the pipes.

The grower's first effort should be directed toward immediate storage of the fruit. The disastrous effects of delayed storage are too well known to need discussion here. There are, however, some other considerations that are not as clearly realized. Among them is the problem of the package. Apple boxes are made of wood which is highly hygroscopic material. Very often they are stored over the summer in hot sheds, packing houses or garrets where they dry up considerably. When such dry boxes are filled with fruit and taken into the storage, they absorb moisture from the storage atmosphere and from the fruit.

A dry New England apple box may absorb over half a pound of water in storage. A heavy field box weighing about 12 pounds may absorb nearly 3 pounds of water as shown by weighing experiments conducted this winter at Rhode Island State College.

In the same experiment, it was found that during the first 6 weeks of storage, apples in dry boxes lost on the average almost 3 times as much water as apples stored in wet boxes. It is true, of course, that these boxes were exceptionally heavy, but many farm storages use rather heavy boxes.

It is clear that the condition of the boxes may influence water loss of apples and thus the time of shrivelling. It is therefore recommended that

boxes be stored in a rather cool and moist place during the summer, and that they be exposed to rain and dew in the orchard or cool shade before harvest time. Soaking them by turning on the hose may be helpful.

In the old days when apples were stored in tight barrels, shrivelling was no problem. Our modern apples boxes, open for ventilation, favor a high rate of water loss. Anything that makes the box tight will decrease loss of moisture and delay shrivelling. Shredded oiled paper, wrappers and liners of all kinds serve the same purpose. One hundred and twenty five special boxes were built at Rhode Island State College and compared with standard boxes made of the same wood. Special boxes differed from standard New England boxes in that they were tight. There were no slits at the bottom and there was a solid cover. It was found that moisture loss was 30% higher in standard boxes when compared with the tight boxes.

War imposed restrictions do not allow us to use many of the new things that would improve keeping of the fruit. Two developments offer considerable promise: Waxing and vapor-proof cellophane liners and wrappers. Both already play a very important role in the citrus and vegetable industries. (The foregoing review of an important subject was prepared for Fruit Notes by Dr. S. A. Pieniazek, Rhode Island State College.)

## TREATMENT FOR BORON DEFICIENCY

Probably the most dependable treatment for boron deficiency (internal cork) in apples is a soil application of borax in a narrow ring under the tips of the branches. Suggested amounts to apply per tree are from 2 to 16 ounces depending on tree size. (For example, a tree with a trunk diameter of 3½ inches should have about 2 ounces; 7 inches - 6 ounces; 14 inches - 8 to 12 ounces; etc.) According to Dr. A. B. Burrell of Cornell University, where soil applications are repeated at 3-year intervals as recommended, it seems desirable to reduce the amount per tree by one-third at the second application, and probably by one-half at the third.

The question has been raised concerning the possibility of applying borax by adding it to one or more of the regular sprays. In Canada, spray applica tions have been recommended for orchards on high-lime soils, and in New York and New Hampshire borax has been included in sprays on an experimental basis. In New Hampshire, large amounts of borax were used without causing injury to apple foliage but in New York some injury resulted where high calcium lime was not included in the spray mixture. A suggested procedure is to include borax at the rate of 2 pounds per 100 gallons in two spray applications - possibly the first and second cover sprays. Unless the deficiency of boron is severe, this treatment should provide protection against the occurrence of internal cork in apples.

It has been shown that an application of borax to the soil lasts about three years. In some cases, protection from a single application may be had for a longer period but it is hardly safe to rely on this possibility. Thus, it is suggested that any orchard which has shown evidence of boron deficiency and to which borax has not been applied for three or more years should be treated this season. Soil applications of borax are recommended but spray applications will probably be satisfactory.

-- Lawrence Southwick

## COLD STORAGE OF STRAWBERRY PLANTS

It is generally agreed that there is no better strawberry plant than the well grown local product. However, much of the handicap of plants from the Middle Atlantic States (due to differences in season) may be overcome with proper handling. It has been found in New York State that plants dug at the proper time (March in the Middle Atlantic States) shipped north immediately and held in cold storage until planting time in the North produce a better stand, earlier growth and earlier runner development than plants shipped at the right time for planting in the North.

Good apple cold storage conditions are ideal for such strawberry plants, i.e., 28°-34° F. and 85%-90% relative humidity. The package of plants should be examined on arrival to make sure that they are moist. If not, sprinkle them but do not soak the packing material as that may cut off air circulation. Plants need not be removed from the bundles while in cold storage, but make certain that they neither dry out nor that the temperature gets high enough to permit growth to start.

-- A. P. French

## FURTHER COMMENTS ON NURSERY PRACTICES

Since last month's outburst against the unethical practices of some nurserymen, a few more items worthy of comment have come to mind.

1. True-to-name Peach Varieties. It is true that peaches, as well as other tree fruits, are examined for mixtures in the nursery row. However, since it is impossible to positively identify all peach varieties in the nursery row the inspection work with peaches is on a much less certain basis than that with other tree fruits. This fact is annually called to the attention of all nurserymen who avail themselves of this service. Yet several of them have so worded their catalogues as to give the impression that their peaches are as positively true to name as are their other tree fruits.

2. Method of Propagation. From the fruit grower's standpoint it makes little difference whether an apple tree is propagated by budding or by grafting using piece root, whole root or an "old-hickory" method, nor does it matter much where they are grown. An individual nurseryman adopts a particular practice because that practice produces the most good nursery trees under his conditions. Thus, a dozen McIntosh trees of equal size from as many sources and methods of propagation, will probably do equally well in the orchard, regardless of the nurseryman's claims.

3. Bud Sports and Superior Strains. That there are strains of some varieties, especially color strains, is an established fact, but unfortunately most of these cannot be identified as different than the parent form in the nursery row. Furthermore, there are probably more strains listed by nurserymen than are actually recognized as distinctly different strains. One nursery's Super Crimson Red McIntosh may be the same thing or no better than another concern's Double Red McIntosh. The fruit differences between many of these strains have not been definitely established as yet.

4. Renaming. The superlatives and coined words used by some nurserymen as a part of the names of their varieties is bad enough, but when a nurseryman deliberately renames a variety, it is just plain fraud. Fortunately, such cases are in the minority, but several have occurred in the past few years.

5. Substitution. One of the most unethical practices of still too large a number of nurserymen is that of substitution. Fortunately, this is practiced less on the commercial fruit grower than on the amateur, but any substitution is too much. Whether a person orders 100 Fredonia grape vines or only one he is entitled to receive what he ordered. He doesn't want the nurseryman to send him a Moore's Early and tell him that it is just as good as Fredonia. Even the average amateur knows as much as the average nurseryman about the merits, defects and adaptability of varieties in his location.

Far worse than acknowledged substitution is the common practice of deliberately re-labeling varieties to fit the order. Some nurserymen care little about having their pears, plums, and sweet cherries inspected for trueness-to-name, because "they mostly go out in small orders anyway," meaning that the most important consideration when filling small orders is to accept the customer's money and send him something. One local amateur after getting mislabeled trees from three apparently reputable nursery concerns asked in disgust, "Aren't there any honest people in the nursery business?"

-- A. P. French

## FERTILIZER NEEDS OF ORCHARD TREES

Recommendation of the proper fertilizer applications for orchards is difficult. There can be no doubt that nitrogen is needed in most orchards, but the need of other elements is often in doubt. We have learned that many orchards need magnesium, and boron deficiences have been found. There are probably a few orchards that need potash. Proof of need for other elements in Massachusetts orchards has not been established, but such may exist. These statements refer to immediate benefits to the trees. There may be indirect benefits from a "complete fertilizer" and also lime. These will build up organic matter in the soil. If sulfur sprays and dusts increase soil acidity so that the pH is around 5 or lower, it must be bad for the trees.

Some orchardists use only nitrogen; others a complete fertilizer. This difference in practice is obviously not closely related to differences in orchard conditions. There is little money wasted in buying nitrogen, but how much of the extra cost for phosphorus and potash comes back to the grower by increased returns for his crop? Perhaps some growers profit from a complete fertilizer while others do not. How can we tell which is which?

There is increasing evidence that a chemical analysis of the leaves may prove the most dependable basis for making fertilizer recommendations. Some progress has been made toward establishing minimum percentages of the different elements. Trees having a lower content are likely to show a characteristic leaf scorch or other evidence of a deficiency. It may well be that trees suffer from too little magnesium or potassium before leaf scorch is evident. An analysis of the leaves might enable the orchardist to prevent the leaf scorch rather than cure it. This would be a great advantage, especially with magnesium deficiency which is slow of correction.

It is premature to state the minimum content of mineral elements in leaves, but they will be somewhere near this: Nitrogen 2%; Phosphorus 0.15%; Potassium 1%; Calcium 1%; Magnesium 0.2% of the dry matter. There will be a border zone around these percentages indicating that trees may or may not be suffering from a deficiency; but if they are well above, the grower may well save his money.

The writer has made many foolish statements regarding orchard fertilization in the past 40 years, and one more may do little harm. So here goes! The next generation of fruit growers will rely largely on a chemical analysis of the leaf for determining his orchard fertilizer program. Let future years show whether this is another foolish statement.

-- J. K. Shaw

## GROW VEGETABLES AS WELL AS FRUITS

Home vegetable gardens are a wartime necessity. They are a vital part of the nation's food production program. The farm labor situation is so tight that regular farmers the nation over will be hard put to reach the food production of the past few years. That means that home gardens must again produce a good share of our vegetable supply. In 1944 these home gardens produced over 40% of the fresh vegetables. Every family, with good land available, should play safe and grow their own in 1945. Following is a list of leaflets which are free to residents of Massachusetts. They may be obtained from the county extension office or from the Mailing Room, Massachusetts State College, Amherst.

No. A34, Home Storage; A59, Home Vegetable Garden; A155, Compost for the Home Garden; A171, Pest Control in the Home Garden; A231, Potatoes in the Home Garden; A232, Starting Vegetable Plants at Home.

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Insist on "High Magnesium" Lime. If your orchard needs an application of lime this spring, by all means make it high magnesium or dolomitic lime. It should be ordered as such. Otherwise, it is likely to be high calcium lime. To make doubly sure, read the label on the bag when the shipment arrives. The analysis should show at least 15% MgO.

Rescuing a Tangled Grapevine. Late March is an ideal time to prune grapevines for at least three reasons: (1) The snow will have settled enough (we hope) to expose the entire vine. (2) If winter injury has occurred it should be apparent by that time. (3) The vine is not inclined to "bleed." A good job of pruning and 2 or 3 well timed sprays or dusts may mean the difference between a highly satisfactory and a disappointing crop of grapes. (For further details on the subject of grapes, see Extension Leaflet No. 64, "Grape Culture in Massachusetts," and Extension Leaflet No. 100A, "Grape Spray Schedule."

DORMANT SPRAY RECOMMENDATIONS FOR APPLE TREES

| PESTS | MATERIALS | DILUTION | TIME OF APPLICATION |
|---|---|---|---|
| San Jose Scale (Note 3) | Oil - Emulsion or Miscible | 2% actual oil (Note 2) | Delayed Dormant or Dormant (Note 1) |
| European Red Mite (Note 3) | Oil - Emulsion or Miscible | 3 or 4% actual oil | Delayed Dormant or Dormant |
| Rosy and Other Aphids (Note 4) | DN Dormant Spray (Liquid / Powdered) (Note 5) | 3/4 or 1 gal.-100 gals. / If 40% DN, 2 lbs.-100 gals. OR as directed by manufacturer | Dormant (Note 6) |
| Scale and Red Mite (Note 9) | Oil - Emulsion or Miscible | 3 or 4% actual oil | Delayed Dormant or Dormant |
| Scale and Aphids (Notes 8, 10) | Oil - Emulsion or Miscible AND DN Dormant Spray, Liq. or Powd. | 2% actual oil - Usually about 1/2 amount that is used without oil OR as directed by manufacturer (Note 7) | Dormant |
| | OR DN-Oil Spray (proprietary) | As directed by manufacturer | |
| Red Mite and Aphids (Notes 8, 10) | Oil - Emulsion or Miscible AND DN Dormant Spray, Liq. or Powd. | 2 or 3% actual oil - Usually about 1/2 amount that is used without oil, OR as directed by manufacturer (Note 7) | Dormant |
| | OR DN-Oil Spray (proprietary) | As directed by manufacturer | |
| Scale Red Mite and Aphids (Note 8) | Oil - Emulsion or Miscible AND DN Dormant Spray, Liq. or Powd. | 2 or 3% actual oil - Usually about 1/2 amount that is used without oil, OR as directed by manufacturer (Note 7) | Dormant |
| | OR DN-Oil Spray (proprietary) | As directed by manufacturer | |

NOTES

1. Dormant oil sprays may be safely applied until the bud leaves are about 1/2 inch long (delayed dormant) provided the spray dries before it is exposed to freezing weather.
2. Miscible or emulsible spray oils contain about 98% oil, and each gallon makes 1% actual oil in 100 gallons of diluted spray. Oil emulsions usually contain 83, 75, or 66 2/3% oil, and 1 1/4, 1 1/3, and 1 1/2 gallons respectively make 1% actual oil in 100 gallons of diluted spray.
3. Dormant or delayed dormant oil sprays give excellent control of San Jose' scale and red mite eggs, but only moderate control of aphis eggs.

4. Dormant DN sprays give excellent control of aphis eggs, but only moderate control of red mite eggs and scale.

5. Liquid DN spray (Elgetol) is SDNOC (Sodium dinitro ortho cresylate). Powdered DN dormant spray is either DNOC (dinitro ortho cresol) or DNOCHP (dinitro ortho cyclo phenol). DNOC is usually preferred to DNOCHP.

6. DN dormant sprays should be applied before the green tip stage of the buds. Varieties of apples which break their buds quickly, such as Gravenstein, Yellow Transparent, and Duchess should be sprayed first.

7. Where dormant DN and oil are combined, the amount of oil and dormant DN is generally reduced to decrease possible injury to buds. Before mixing, read the manufacturer's directions carefully.

8. McIntosh and Cortland are very susceptible to lateral bud injury by DN-oil spray and it cannot be used safely on these varieties.

9. On McIntosh which is seldom attacked by rosy aphis, a 3 or 4% diluted oil spray to control scale and red mite is the most practical dormant treatment.

10. On Cortland, which is very susceptible to rosy aphis, a DN dormant spray without oil to control aphis, followed by a DN summer spray or dust to control red mite, if necessary, is suggested. If both scale and aphis are serious on Cortland, the risk of injury from DN-oil spray must be taken.

11. DN 111 spray and DN D-4 dust are dinitro products for summer use and should not be confused with Elgetol or DN powders for dormant sprays.

12. Bud moth, fruit tree leaf roller, apple red bug, and other scale insects are also controlled by dormant sprays.

-- W. D. Whitcomb

## RABBIT INJURY IN FRUIT TREES

Many of us are more concerned than usual about the injury to our orchards from rabbits this winter. The combination of a deep covering of snow and an unusually large population of "Cotton-Tail" rabbits has set the stage in many orchards for serious rabbit injury.

A brief review of my experiences in controlling rabbits in my own orchards may be helpful to some readers of "Fruit Notes." About five years ago, we set an orchard of about a thousand apple trees, mostly one year whips. This orchard is divided by stone walls into several blocks and has brushy pasture land and woods near it. These are ideal conditions for harboring rabbits. On the second day after planting, we knew we had a problem on our hands when we found quite a few of our one-year whips cut off about a foot above the ground. The injury was greatest near the outside of the orchards and new evidence of rabbit snipping was found for several weeks, although it was worst just after planting time.

That summer we made plans to protect the young trees as it was a sure bet there would be a lot of injury the following winter if nothing was done. Several repellents, to be applied either as a paint or a spray, were available. We chose a repellent which is made by dissolving 7 pounds of rosin in 1 gallon of industrial alcohol, and applied it with a small paint brush. This combination of materials proved to be safe for the trees and was used several years

with good results. In fact, we decided after the first year's experience to apply the solution to all young trees immediately after they were set. We had a girl follow the planter and treat each tree.

As the trees became larger, the job of painting the trunk and branches to a height of at least three feet, became quite a chore. This past fall found us behind on our work, and hired help was as scarce as "hen's teeth." It seemed that the job of painting all those trees would be impossible. So we decided to try trapping the rabbits to lessen the possibility of injury. After this winter's experience with box traps I am convinced that at last we have found a method we should have chosen at least two years ago. Trapping and removal of rabbits is eliminating the source of trouble whereas painting with repellents only delays it. In my estimation, the repellents should be considered only as an emergency measure to give protection until such time as more effective steps can be taken.

You will be interested to note that I have caught 17 "Cotton-Tails" so far this winter. Most of them have come from the brush areas on my farm. Out of all the young trees which we now have, I do not think we could find more than a dozen trees which have been injured by rabbits this winter.

The amount of injury is quite different in several other orchards where no control measures have been practiced, or where trapping was started late. In one orchard where there are apple and pear trees of different ages, there has been very serious damage to both apple and pear trees. Whole young trees have been eaten off to the snow level and on many trees six to eight years old, the bark has been removed on large areas of the trunks and main limbs. I have seen older bearing trees where the rabbits have made a clean job of removing the fruit spurs within reach. Eleven rabbits have been removed from this orchard so far, and there are still a few more to be caught.

The trapping of rabbits is very simple and can be done after the rush of the fall season is over. Apples make ideal bait; some people say sweet varieties are preferred although I doubt if it makes much difference if they are sweet or slightly acid. Cold nights following a moderately heavy snowfall seem to be ideal for catching rabbits. One can make his own traps at little or no expense except for the labor required. It should not take more than an hour to build a trap. The necessary odds and ends can be found on most farms.

There are many designs of box traps. The type made by using boards for the top and bottom and small mesh poultry netting for the sides and back is most desirable. A trap 10" or 12" square, and 18" to 24" long is large enough. The trigger arrangement for closing the door is the one feature which has received most attention. (Any grower interested in the details of construction may obtain them by dropping a line to the writer, French Hall, M.S.C., Amherst, Mass.)

Just a word of caution. All rabbits caught must be reported to the State Department of Conservation, Div. of Fisheries and Game, Boston, Mass., giving the number of rabbits taken and disposition of the same.

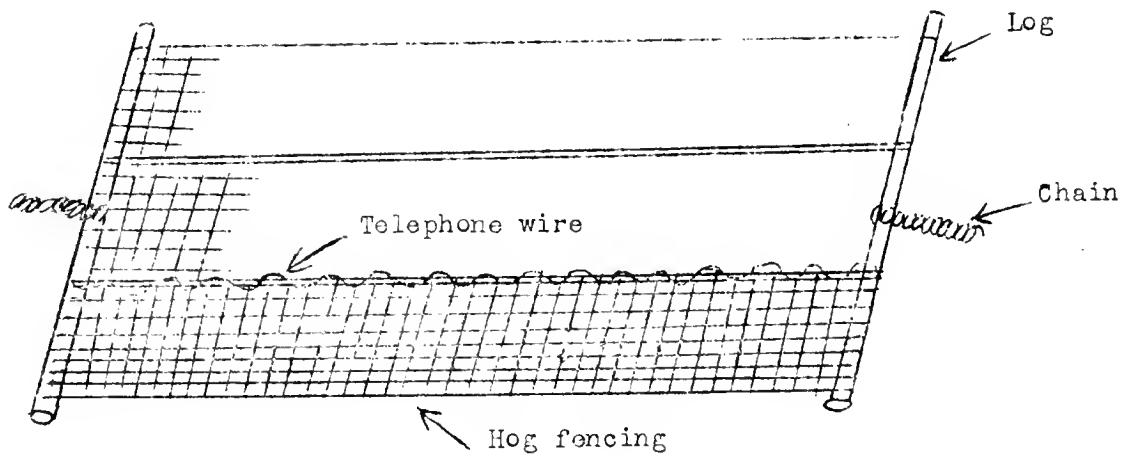
-- A. C. Ballard

## CONSTRUCTION AND HANDLING OF THE BRUSH DRAG

A brush drag which will save considerable time and labor in hauling brush from the orchard can be constructed from heavy hog fencing. The drag is constructed by tying together three 18 to 20' sections of "No. 9½ wire" hog fencing. The sections are tied together by weaving a piece of heavy wire, such as telephone wire, around the outside wire of each section. Three sections of hog fencing will make a drag about 9 feet wide. Attach a log 9 to 12" in diameter to each end of the drag. A short chain is fastened around the middle of each log, so the drag can be hauled from either end.

Brush can be easily piled on this type of drag, and it will have a full load at about the time the pile is too high to load easily. The real saving in time and labor comes in unloading the drag. A long 3/4" rope is tied to the rear end of the drag and brought up over the load and hitched to the tractor. Unhitch the drag from the tractor and start up with the rope hitch. The load of brush will then be rolled up into a compact pile, and the drag will be pulled free and clear of the brush pile.

This drag will slide along quite easily on a heavy frozen sod, but it may bog down if the orchard is very muddy, and of course it may get hung up on stubs or similar obstructions between the tree rows. However, these disadvantages are offset by the ease with which the drag is loaded and unloaded when compared to a truck or wagon.




-- W. D. Weeks

New Mimeographed Circulars. A new publication on Brush Pushers will soon be available. Sketches and copy were submitted for mimeographing a few days ago. For those individuals living in towns where the growing of currants and gooseberries is permitted, a new mimeographed circular on that subject will also be of interest.

How Soil Thaws. It is not very generally known that the thawing of a frozen soil in spring proceeds more rapidly from below than from above. In a thorough study of the effects of various ground covers on freezing and thawing, as compared with a bare soil in Kansas, soil heat was found to be about 3 times as efficient as that of the air, in reducing the thickness of the frozen layer.

## VARIETIES OF CULTIVATED BLUEBERRIES FOR MASSACHUSETTS

Although the blueberry variety list is short, the variety question, nevertheless, is an important one. Since new varieties are being introduced fairly rapidly, a periodic reappraisal of the variety situation is necessary. Cabot, Pioneer, and Rubel have for a number of years been the three most satisfactory varieties and are still the most favored by Massachusetts growers. Cabot is the earliest of the three. It usually starts to ripen the second week in July. The bushes are relatively low, usually not over 4 to $4\frac{1}{2}$ feet high, spreading, and only moderately vigorous. Also, the bush is very susceptible to a disease called Phomopsis gall, which looks like crown gall, and is somewhat subject to winter injury. The fruit is rather tasteless and not the best blue, but the size is good and yields are good. The berries usually crack badly after rains and drop badly if they become overripe. Earliness, especially for the roadside stand, is the most important advantage of this variety.

Pioneer is a midseason variety. The bush is a little taller than Cabot, equally spreading, and slightly more vigorous. Because of its habit of growth, it requires more detailed pruning than other varieties. The berries are a good blue, large when well grown, very fine flavored, and good keepers. Unfortunately, yields are only light to moderate. For general planting it is the best of the midseason varieties. Rubel, the latest of these three, is the most desirable for all around planting. The bush is tall, upright, vigorous, very productive, and resistant to winter injury. The fruit has more flavor than Cabot but is not so good as Pioneer. The berries are only medium in size, but their color is good and they ship well. It is the easiest of the three to propagate.

Jersey, one of the newer varieties, is well worth a trial both by the commercial grower and the home gardener. The bush is tall, upright, vigorous, productive, easy to propagate and prune, and resistant to winter injury. The fruit is large, very attractive and very fine flavored when fully ripe. It colors before it is fully ripe so that care must be taken not to pick it too soon, else it will be sour. The stems are long, making picking easy. It ripens with Rubel, but the picking season is not so long. It does not sprout from the base as freely as is desirable.

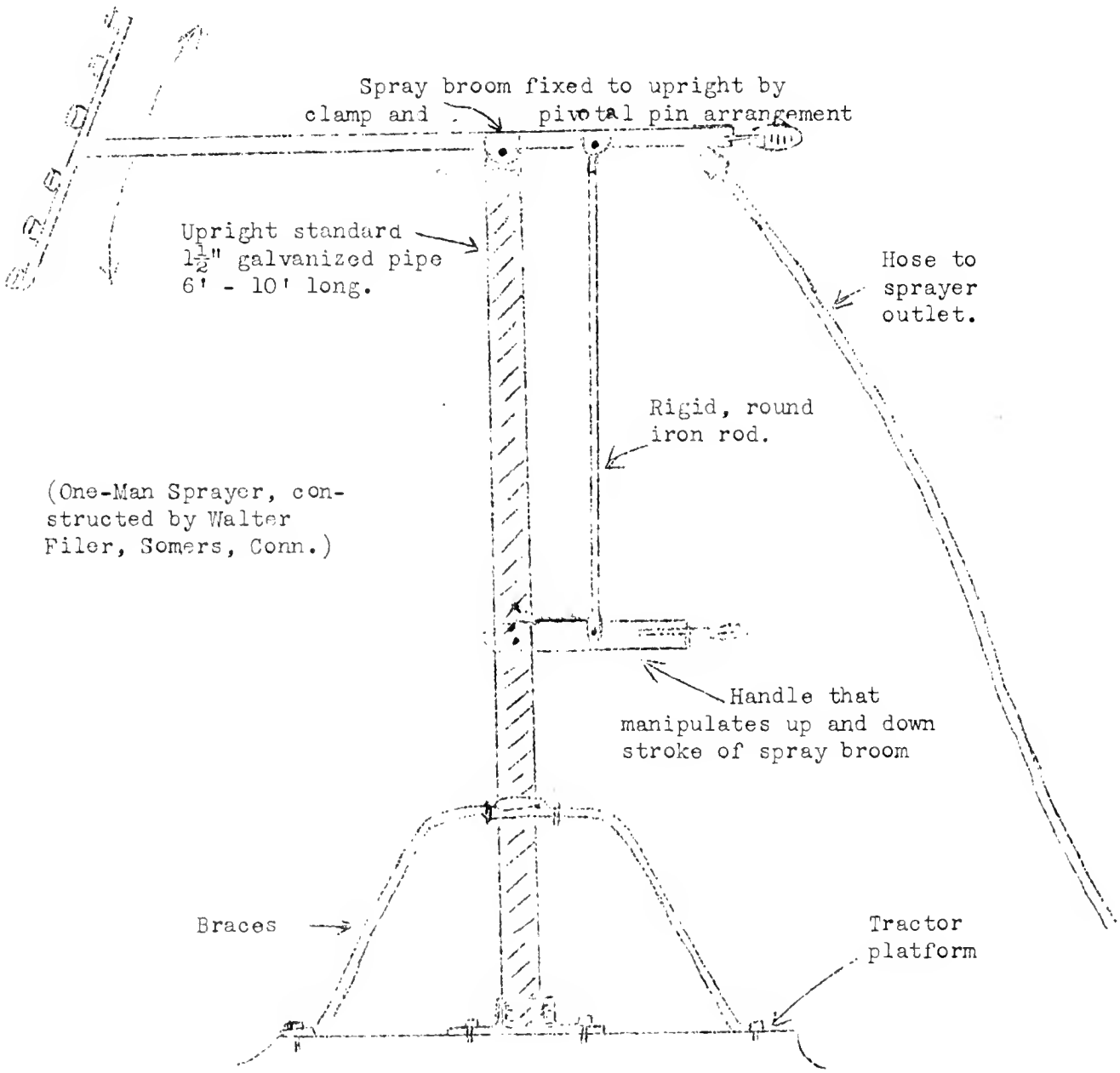
Concord, a midseason variety, ripening with Pioneer, is well worth a trial on the heavier soils of the northern and western parts of the state where it grows and yields well. It is not recommended for southeastern Massachusetts where it does not thrive on the light, sandy soils. On the soils where it thrives the bushes are tall, upright, vigorous, and productive. The fruit is large and very attractive but not quite so fine flavored as Pioneer. The fruit clusters are tight and the berries hang to the stem well so that the first picking or two is not so easy as with a long-stemmed variety like Jersey. There is a slight tendency for the skin to tear in picking. These are both serious disadvantages from a commercial standpoint. The fruit ripens with Rubel.

Atlantic, a new variety ripening with Rubel, seems worthy of trial. Although it has not yet fruited at Amherst, the fruit is said to be much larger, better colored, and finer flavored than that of Rubel. Burlington,

another new variety which has not yet been fruited at Amherst, seems worthy of trail. It is said to be somewhat later than Jersey and Rubel and has unusually good keeping quality. The fruit is above average in dessert quality, an attractive blue, and medium to large size. The bush is upright, vigorous, and moderately productive.

To sum up, Pioneer, Rubel, and Jersey are the best commercial varieties. Cabot is recommended only where an early variety is especially desired. Concord is a midseason variety recommended only for the heavier soils of the northern and western parts of the state. Pemberton, Atlantic, and Burlington are promising but are recommended for trial only. Since blueberry varieties are totally or partly self sterile, two or more varieties need to be planted together.

-- J. S. Bailey




(Place within handy reach of the tractor operator.)

MR. WILLARD A. MUNSON
DIRECTOR
EXTENSION SERVICE
SOUTH COLLEGE

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# FRUIT NOTES

April 16, 1945

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



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## APPLE SCAB OUTLOOK

There are two principal factors which govern the amount of early season scab infection in unprotected trees, - the amount of carry over of the scab fungus in the orchard (in last year's scabbed leaves), and the kind of weather encountered during the pre-pink bud stage to petal fall, inclusive. If the weather is dry during that period, or if it is characterized by several short wet periods, even a heavy carry over of scab would be of little consequence. Short periods of wetting serve to release scab ascospores but do not permit infections. If at that time, however, prolonged wet per-

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iods occur, even a slight amount of inoculum in the orchard is likely to prove hazardous.

At present, many orchards in the state show a heavier carry over of the scab fungus than usual, for the reason that some growers "let up" on spraying last summer when the season was dry. As one result, thore developed more storage scab last winter than has been seen for several years. Another result is an abundance of old, spotted leaves in the orchard literally loaded with ripe ascospores ready to "shoot" during the next rain. Scab spore development in the old leaves is as far advanced as fruit bud development. Heavy discharges will occur in all orchards during the next few wet periods. Hence, the pre-blossom sprays of sulfur are likely to be very important on scab-susceptible varieties.

With the season so far advanced, long, cool, damp periods are likely to be encountered before bloom, and certainly before petal-fall. Special consideration might well be given to the prospective need of dusters (or sprayers in the absence of dusters) during rainy periods. This holds true especially during the blossom period when spore dissemination for both scab and the cedar rusts reaches its peak.

Infection Periods to Date. - So far (April 11) there has been only one infection period for apple scab. The rains on April 2 and 3 furnished an intermittent wet period of about 22 hours in Amherst at an average temperature of around 56° F. Although this was longer than necessary for infection to occur at that temperature, the spore discharge was very light. Fruit buds were between delayed dormant and pre-pink. Only a very light infection is expected from that wetting. The next rain on April 4-5 caused a heavier spore discharge, but the 15 hour period of wetting was too short to allow scab infection at the prevailing temperature of about 43° F. It was during that rain, with fruit buds in early pre-pink, that cedar-apple rust spore horns first underwent gelatinization and discharged spores. The first spore-shower from quince rust cankers is yet to come, but it will occur during the next rain.

-- O. C. Boyd

## PASTE SULFUR IN THE SPRAYING SCHEDULE

Paste sulfur has been both praised and condemned. It has been praised for its excellent fungicidal properties and scab control; condemned because it is difficult to handle. Paste sulfur is the finest particle sulfur of the wettable sulfurs, and in this respect comes closest to the spray residue resulting from liquid lime sulfur; but, in contrast to the liquid, paste sulfur embodies all of the safe features of the mild or dry wettable sulfurs.

Paste sulfurs derived from the gas production industry contain from 40-50% active sulfur. The balance is essentially water. With the inherent advantage of extremely small particle size, paste should be used at no more than 10 lbs. to 100 gallons of water, and this maximum amount should be limited to the early critical sprays. For the finishing off applications toward the end of the season, the amount can be reduced to 5 lbs. Thus, in

the interval the amount of paste should be lowered in steps from 10 to 5 lbs. to 100 gallons of water.

The handling of paste in practice should not be cumbersome. Handling is simplified by marking off on a pail the volumes corresponding to the weights of paste desired; i.e. 10, 20, 30 lbs., etc. Accuracy is not too important since 1 or 2 pounds more or less to the tank would be of no consequence. The traditional user of dry materials will find nothing cumbersome in the handling of paste sulfur, once he has acquired the routine of its use.

Once the barrel of paste is opened, water should be added to prevent drying. Drying destroys the fine particle state of paste and converts the material into grit. The paste should be kept covered with a little water at all times to prevent this change. Sulfur paste should not be added directly to the spray tank. It should be diluted in a pail with a little water and made into a thin soup, then poured through the screen in the tank. This procedure is important to avoid "gumming up" the intake strainer in the bottom of the tank, or clogging the spray nozzles.

Combined sulfur and lead arsenate is generally not advisable on Red Delicious, Starking, and Baldwin varieties due to the russet injury to the apples from the combination. Paste sulfur offers no exception. Russet can be avoided on these varieties by substituting Fermate for sulfur, particularly in the "Pink," "Calyx," "First and Second Cover" applications.

Paste sulfur offers some means of economizing in materials, but its chief merit is its fineness and its fungicidal efficiency, the latter being one of the major objectives in plugging up the loop holes or weaknesses in our apple spraying program.

-- E. F. Guba

## AN EARLY SPRING

The spring of 1945 is by far the earliest in many years. April weather in March started growth and on April 2 apple trees were about as far advanced as they were a month later in 1944. The average date of full bloom of McIntosh in the College orchards is about May 14. The buds are now (April 12) in the Pink stage and will be in full bloom in a very few days if the present warm weather continues, or about a month ahead of the average and two weeks ahead of any previous record. The cold morning of April 7 (27°F.) was a narrow escape from disaster. Five degrees colder would have cleaned out the crop. The average minimum temperature for April at Amherst is 22° and for May it is 31.2°. If a temperature of 2 or 3 degrees below the May average occurs later this year, it will cause great damage. If we get by this spring it will be almost a miracle. Our native fruits are able to withstand the following temperatures for 30 minutes or less.

| | Buds Closed but Showing Color | Full Bloom | Small Green Fruits |
|---|---|---|---|
| Apples | 23-25° | 27-28° | 29° |
| Pears | 26-27 | 28-29 | 29 |
| Peaches | 25 | 27 | 30 |
| Cherries | 28 | 28 | 30 |
| Plums | 25 | 28 | 30 |
| Grapes | 30 | 31 | 31 |

— J. K. Shaw

# Pomological Paragraphs

NITROGEN IN PEACH TREES. A 17-year-old unfertilized peach orchard in Davis, California, was fertilized in September with ammonium sulfate, calcium nitrate, and urea. The soil and trees were studied during the winter and early spring to learn how the nitrogen from these three sources behaved in the soil and in the trees. Ammonium sulfate was fixed in the soil more than the other forms of nitrogen, but nitrates had gone down as far as the third foot by February 27. Analysis of the shoot bark on March 7 showed the nitrogen content increased over that of unfertilized trees. The source of the nitrogen made little difference. This was also true of the nitrogen content of the leaves which were first examined on April 10. This is in harmony with the usual belief that under most conditions fruit trees will make about equally good use of nitrogen from various sources. (Proc. Amer. Soc. for Hort. Sci., Vol. 45, page 5).

-- J. K. Shaw

WARMING THINGS UP. You have doubtless noticed that snow melts more quickly on a black tar road than on a lighter colored cement road. This is because a dark surface absorbs more heat from the sun. Observations in New Hampshire show that the inner bark on the south side of a fruit tree may rise to 60° F. or more on a cold winter day, while that of the north side may be 30° to 50° F. lower. Painting the trunks white resulted in much lower temperatures, at no time more than 10° above that of the air. At night or on cloudy days, there was little difference in bark temperature. If we have sunny weather during a January thaw, peach buds will swell much more than when the weather is cloudy. (Proc. Amer. Soc. Hort. Sci., Vol. 45, page 33) -- J. K. Shaw

WAX SPRAYS FOR BLOSSOM THINNING. There is considerable interest in the use of sprays for blossom thinning. Hand thinning is laborious and, with prospects of labor shortage, anything that will save labor is of interest. The Michigan Experiment Station proposed to use an oil-wax emulsion for this purpose. It was first used to reduce transpiration and thus economize water in dry periods. A 1% concentration used in the regular sprays gave a marked increase in the size and yield of Montmorency cherries. Used as a blossom thinning spray, it seemed to be somewhat effective but more work is needed to determine whether it is entirely satisfactory. It does not injure the foliage as does Elgetol or a Dormant DN spray. We hope to try the oil-wax emulsion this season and be able to report on its effectiveness under our conditions. (Proc. Amer. Soc. Hort. Sci., Vol. 45, page 42). -- J. K. Shaw

ELGETOL KILLS POLLEN GRAINS Elgetol used for blossom thinning kills the pistils and other parts of the flower; also, it burns the young leaves to some extent. Of course, killing the pistil before fertilization of the egg cell prevents setting of the fruit. Work at the Cornell Station shows that Elgetol also kills pollen grains before or after germination even in very dilute concentrations. Therefore, they say that Elgetol should be called a "pollenicide" not a "caustic spray." However, bees may sometimes bring viable pollen from

unsprayed trees. If the pistil is killed before the pollen tube has grown downward far enough to escape the toxic effects of the spray, no fruit can be set. It still seems that pistil killing is an important factor in blossom thinning. They recommend that a 2-day period between pollination and fertilization of the egg cell is enough to insure set of the apple. It will, of course, depend on temperature. If the weather is cool, it will take longer than in warmer weather. (Proc. Amer. Soc. Hort. Sci., Vol. 45, page 53.)
--J. K. Shaw

BLOSSOM THINNING WITH ELGETOL

In Virginia, 33-year-old York Imperial trees which were quite definitely in alternate bearing were sprayed with Elgetol in concentrations of from approximately one to three pints in 100 gallons of spray. A concentration of a little under 2 pints gave the best results on this variety. On thinned trees, there was some reduction in the percentage of Number One apples on account of roughness, stippen on oversize apples, etc., but no color differences were apparent in the harvested fruit. With stronger concentrations, size of fruits increased and total yields decreased. (Proc. Amer. Soc. Hort. Sci., Vol. 45, page 45). --J. K. Shaw.

FURTHER TESTS WITH BLOSSOM THINNING MATERIALS. Tests of the effectiveness of various materials for reducing the set of Delicious, Gano, Stayman, and Arkansas Black apples were made in 1942 and 1943 in New Mexico. Elgetol reduced set but caused considerable injury. The chemicals commonly used to make apples stick to the trees in the fall were also tried. It may seem foolish to expect such a chemical to make apples drop in the spring, but we know that a high nitrogen fertilizer makes apples stick in the spring and also may increase drop in the fall. When these materials were used in strong concentrations, the set of fruit was practically eliminated. Napthalene acetic acid, the active principle in many preharvest sprays, used at very weak concentrations, thinned the fruit successfully and did not cause severe injury. Certain chemicals related to napthalene acetic acid were not effective. Borax at .5% and 1% concentrations reduced set without visible injury. These materials are not yet recommended for thinning apples, but further study may show a way to reduce set without injury such as that caused by Elgetol. (Proc. Amer. Soc. for Hort. Sci., Vol. 45, page 63). --J. K. Shaw.

New Bulletin. A new bulletin in the series on the identification of fruit varieties by vegetative rather than fruit characteristics has been written by Lawrence Southwick, A. P. French, and O. C. Roberts of the Pomology staff. It is expected that this Experiment Station Bulletin No. 421 will be available for general distribution by the time this copy of Fruit Notes is received. The title is "The Identification of Pear Varieties from Non-Bearing Trees." Special consideration is given to the characteristics by which nursery pear trees may be identified. Descriptions and photographs of some 40 varieties are given. As with other Station or Extension bulletins, copies will be sent to those requesting them.

## WINTER KILLING OF RED RASPBERRIES

In spite of the continual snow cover during the past winter, there is considerably more winter killing of canes in the College plantation this spring than a year ago. The canes of many varieties are entirely dead above the snow line.

A three-year average shows that Chief, Latham, and Indian Summer are the most winter hardy, showing only about 10% killing; next come Taylor, Ranere and Sunrise with about 20% killing; and Milton with about 40% killing; while Cuthbert, Marcy and Newburgh show from 55-70% killing.

Unfortunately, some of the most winter hardy varieties have other weaknesses. Indian Summer fails to mature its fall crop, Taylor is seriously damaged by mosaic when present, and Sunrise is inferior in size and quality. So the search for the perfect red raspberry continues.

-- A. P. French

## GET YOUNG TREES OFF TO A GOOD START

Good nursery trees are expensive and hard to get. The way some of these trees are handled at planting time and afterward is a horticultural crime. They should be made to grow rapidly from the start and not allowed to loaf along the first season. A "leader" should be encouraged by removing entirely or cutting back any competing branches. Whorls of branches and forks should be corrected promptly. Even more important than the pruning at planting time are the corrective cuts during the second and third years. If delayed until the tree is four or five years old, larger cuts are necessary and an ideal framework is, in many cases, out of the question. Let's give those young trees the attention they need this spring.

## NITROGEN CONTENT OF APPLE LEAVES

There seems to be a close relationship between the amount of nitrogen in apple leaves in late summer and the color of the fruit. The optimum nitrogen content is probably slightly under 2%. In one orchard where the fruit was of good color the nitrogen content was found to average 1.8%. In another orchard where the fruit was of poor color the nitrogen content was 2.1%. It is a well known fact that over vigorous trees tend to have dark green leaves which are indicative of a fairly high nitrogen content while trees with lighter colored leaves may bear fruit of high color. In years to come we will probably analyze apple leaves in late summer as one check on the nitrogen needs of the tree. This will help to supplement our present knowledge of the factors responsible for fruit of inferior quality.

Fruit Notes Mailing List. Mailing lists for all of the M.S.C. Extension publications are now being revised. A letter to that effect is being mailed out by Director Munson. If you care to remain on the Fruit Notes list, a prompt return of your card will do the trick. All names added since December, 1944 will automatically be continued.

## THE "GREEN MCINTOSH" PROBLEM

Apple buyers are showing little interest in McIntosh apples unless they are firm and of good color. Here are a few comments heard at a recent meeting in Worcester: "We have too many green McIntosh." "I'd rather have $2\frac{1}{2}$ inch red McIntosh than 3 inch green ones." "When we get the right kind of fruit, we can get a good price, but 75% of the McIntosh in storage are too green and soft."

With thousands of bushels of green McIntosh still to be sold, growers and dealers alike are asking "What's happened to McIntosh?" "What are the reasons for so high a percentage of green apples in certain orchards?" This is the subject of a detailed statement which has been prepared by the members of the Pomology Department at M.S.C., to be sent to every interested apple grower in Massachusetts. Any reader of Fruit Notes who fails to receive a copy of this analysis of an important problem within the next two or three weeks may obtain it by dropping a postcard to W. R. Cole, Secretary, M.F.G.A., Amherst, Mass.

Among the reasons for poor color outlined in the above mentioned statement are (1) Too much nitrogen in late summer. (2) Fruit immature. (3) Magnesium deficiency. (4) Boron deficiency. (5) Trees too crowded. (6) Inadequate pruning. (7) Weather conditions, which may affect all these factors and increase the tendency toward oversize fruit, delayed maturity, poor color, and early drop.

In answer to the question, "Should nitrogen applications be discontinued?" we should bear in mind that nitrogen starvation reduces yield and tends to throw even McIntosh trees into biennial bearing. It is advisable, of course, to maintain a good sod cover in the orchard. This calls for magnesium limestone and a "complete" fertilizer in moderate amounts broadcast on the grass at intervals varying with soil conditions. The remedy for too much nitrogen in the tree is less nitrogen, not more phosphorus or potassium.

There are several things which the apple grower may do to reduce the percentage of green McIntosh. He may (1) Adjust the nitrogen application to fit the orchard. (2) Correct magnesium deficiency. (3) Correct boron deficiency. (4) Allow apples to reach reasonable maturity before harvesting. (5) Remove crowding trees. (6) Grade out and dispose of green McIntosh in the fall, if possible, instead of trying to hold them in cold storage.

The State College will cooperate in a further study of the green McIntosh problem. From a list of orchards which persistently produce green, inferior quality McIntosh, a number of orchards will be selected for a careful analysis of the factors which may be responsible. Other orchards which produce firm, high colored McIntosh will provide a basis for comparison. A detailed report of this study will be presented at the annual meeting of fruit growers in Worcester next winter.

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New Seedling Apple. We have a few one-year trees of a promising seedling apple called A-17, developed here at the College, for trial distribution to interested growers. It is an early apple, ripening in late August. A few trees were distributed last year. Anyone wishing to test this seedling may contact the writer at Massachusetts State College, indicating the number of trees desired. --Lawrence Southwick.

## CORRECTION OF MAGNESIUM DEFICIENCY

Magnesium deficiency is rather widespread in apple orchards. In some cases, definite symptoms such as leaf scorch, early defoliation and excessive preharvest drop have been observed. In others, clear-cut symptoms have not been noticed. It is probably true that many orchard soils in the Northeast are close to the deficiency level for many plants, including apple trees. For this reason, the general orchard use of high magnesium limestone is recommended, except where the soil acidity is already up to pH 6, or above. One other recommendation that could be followed rather generally is the inclusion of Epsom salts in one spray application. The use of 15 pounds of Epsom salts in either the First or Second Cover spray might help to tide trees over a slight magnesium shortage situation. For definitely deficient orchards, further measures are advised. The above recommendations refer to "borderline" cases, where definite deficiency symptoms have not yet appeared.

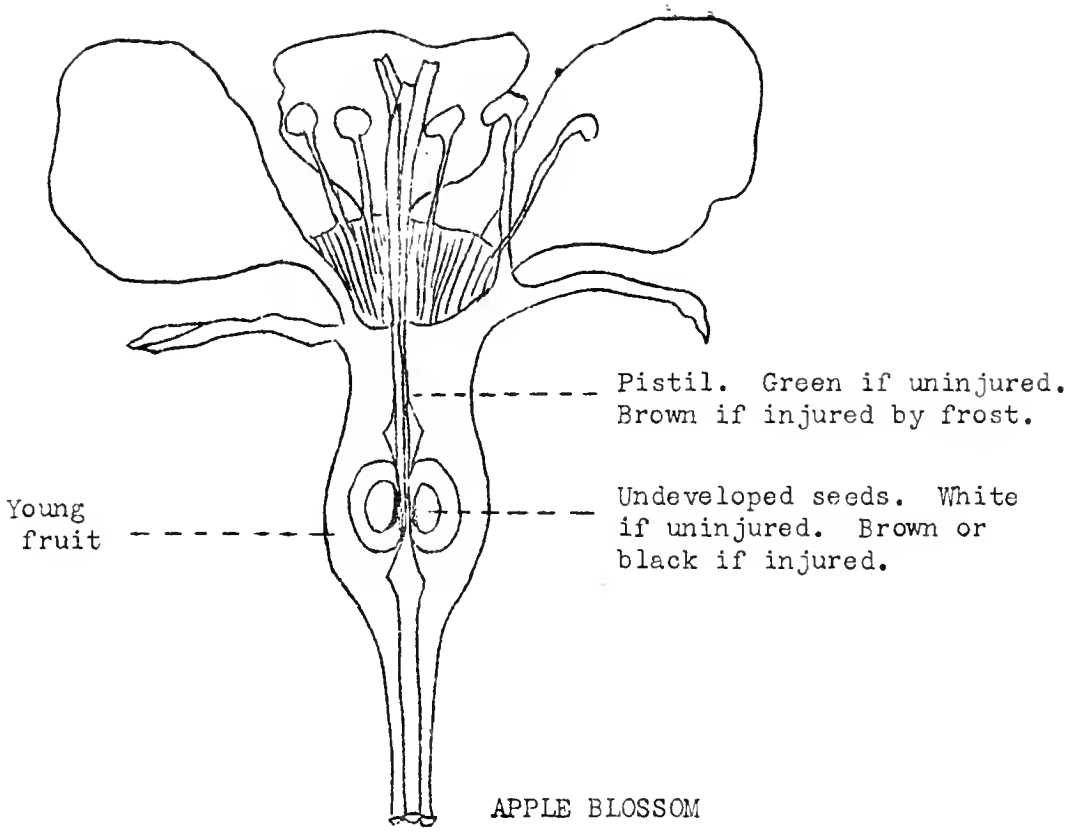
-- Lawrence Southwick

## ORCHARD HEATING

The old idea that a smudge or smoke screen will ward off a frost has been disproved. Frost damage in an orchard is prevented only by actually raising the temperature of the air above the danger point. Many small fires, well distributed, are much more effective than a few large ones which might merely serve to set up heavy convection currents and thus bring in a flood of cold air from the surrounding country. One large fire, as for example a burning brush pile alongside the orchard, is likely to be of little if any benefit.

Only an occasional grower in Massachusetts will probably find it possible to equip himself with the necessary containers and fuel for orchard heating this spring. As a matter of insurance, in case the temperature drops only a degree or two below the critical point, even as few as 10 or 15 containers per acre may be worthwhile. One grower who has done considerable orchard heating believes that approximately 25 containers per acre are necessary where a severe freeze is involved. He has used paint pails holding two or more gallons and has actually raised the temperature of the orchard air as much as 6 degrees above that of the surrounding territory. Ordinary fuel oil was used. Waste crankcase oil has the disadvantage of boiling over because of its water content. Anyone who plans to try orchard heating this year must of necessity provide himself with one or more strategically located thermometers which are accurate within a degree at least. The next item of importance is to make sure that the heaters are lighted shortly before the temperature drops to the danger point.

PENICILLIN-LIKE SUBSTANCE FOUND IN LEAVES AND FRUITS. Research workers at Michigan State College have discovered germ-killing substances in the fruits of blueberry, currant, mountain ash and honeysuckle, and in the leaves of the Scotch thistle, mullein and peony. Negative results were obtained from horseradish, turnip, and cabbage. These discoveries suggest that the Indian medicine man and other users of plant extracts, poultices, etc. may be ahead of their time.



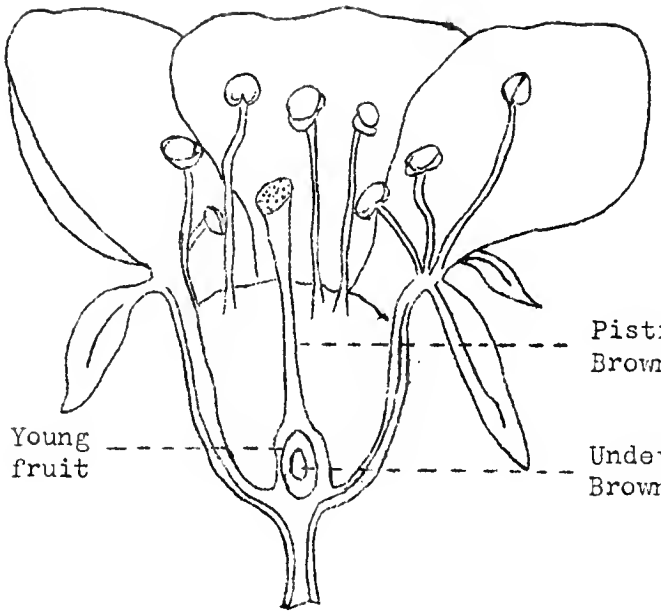

APPLE BLOSSOM

Frost Injury to Flowers or Young Fruits

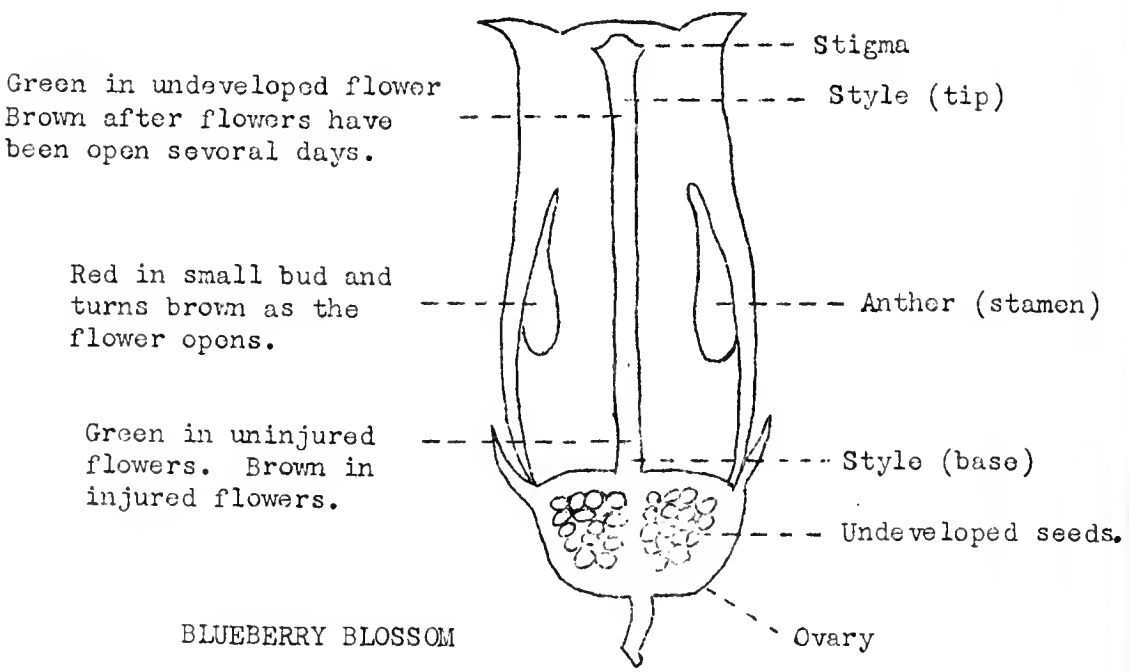
If a frost comes, every fruit grower will want to know how much damage has been done. Since time must elapse for injured tissues to warm up and change their appearance, the full amount of the damage may not be apparent until afternoon or even the following day, depending on the temperature.

During blossoming, the pistil is the part most easily hurt. The normal pistil is light clear green in color. Injured pistils first look watersoaked, then discolored and wilted, and finally turn brown, shrivel and die. Since normal pistils, following fertilization of the ovary, turn brown, shrivel and die, this normal condition should not be confused with frost injury.

When the young fruits have formed, the seeds are usually the most tender. Normal seeds turn brown or black. With apples the tissue just outside the seed cavity is sometimes injured. Although apples with injured seeds sometimes set, such apples are small or misshapen at maturity. Those injured outside the seed cavity seldom mature. Sometimes the injury takes the form of a loosened layer of cells around the small undeveloped fruit and upper part of the stem. With peaches, the veins around the seed are the most sensitive, then the seed and finally the flesh. The skin of a young fruit which is badly injured by frost, turns yellow and the fruit drops in a few days. If injured only to the extent of a slight slipping of the skin, the fruit may mature although it will show russeting or frost cracks at harvest time.




STONE FRUIT BLOSSOM




BLUEBERRY BLOSSOM

--J. S. Bailey and James Robertson

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# FRUIT NOTES

May 25, 1945

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



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## THE APPLE SCAB SITUATION TO DATE

This has no doubt been one of the most favorable seasons in many years for scab infections. Up to the present (May 21), there have been eight general infection periods in the State since apple trees were in the late delayed dormant stage of fruit bud development. Not only have rainy periods been numerous, but the total precipitation has been excessive. For example, the total rainfall in Amherst during April was 5.43 inches, or 2.08 inches above normal; and for May (up to the 21st), 5.97 inches, which represents 2.37 inches above normal for the entire month. The following are the dates of apple scab infection periods for unsprayed McIntosh trees at Amherst and the dates when the scab spots appeared on the new leaves:

| Date of Rain | Tree Stage | Scab Spots Appeared |
|---|---|---|
| April 2 | Pre-pre-pink | April 29-30 |
| April 17-18 | Early bloom | May 11-12 |
| April 25-26 | Late bloom | May 13-14 |
| April 30-May 1 | Calyx | May 16-18 |
| May 3-5 | Calyx | May 18-20 |

Issued by the Extension Service in furtherance of Acts of May 5 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

Additional infection periods occurred here on May 8-9, 13-14, and 16-19 from which scab spots have not yet developed. Since the winter spore supply in the old leaves is almost completely exhausted, the principal source of scab spores for further infections will be summer spores produced in the new fruit and leaf spots.

--O. C. Boyd

## TEMPERATURE RELATIONSHIPS FOR APPLE STORAGE ROTS

A study of apple storage rots in the state of Washington revealed 40 species of fungi to be associated with loss of apples in cold storage. Only about a dozen rots are of common occurrence in Massachusetts apple storages. Although all organisms able to bring about the decay of apples at cold storage temperatures will cause more rapid decay at higher temperatures, certain fungi are able to cause definite decays in ordinary storages but are totally inactive in cold storage. An examination of some of the literature dealing with apple storage decays reveals the following classification of storage rot organisms according to their relationship to temperature.

1. Fungi unable to cause decay in cold storage but capable of causing rapid decay in common storage and on the market: Rhizopus nigricans (the Bread Mold Fungus); Phoma sp., cause of Phoma Rot.

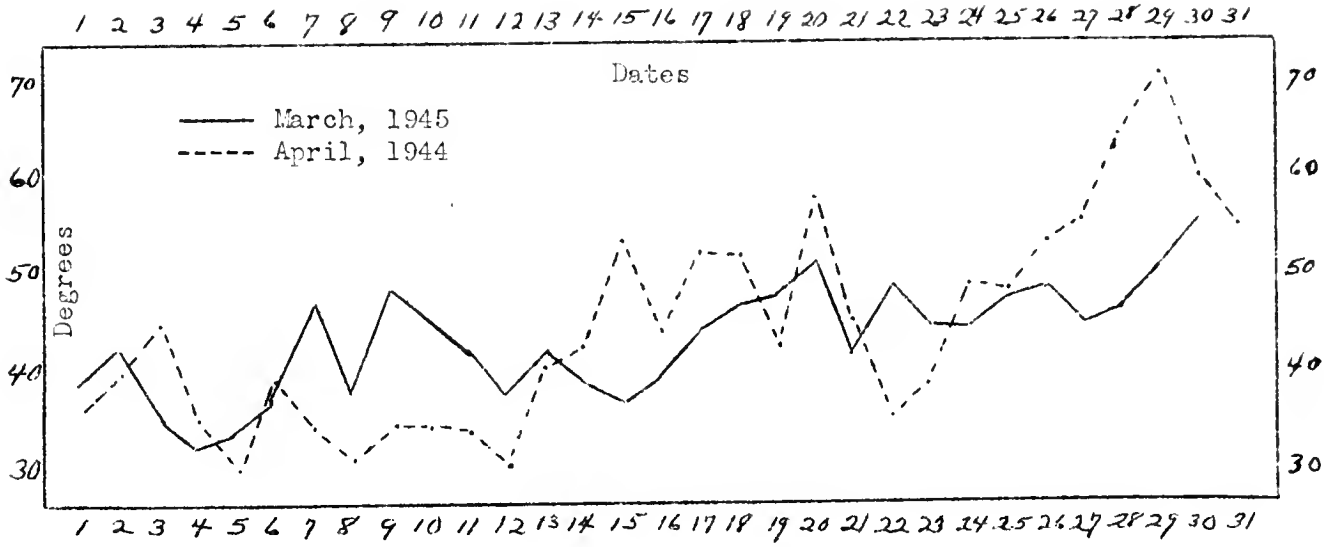
2. Fungi unable to cause decay at cold storage temperatures but able to cause spot rots at higher temperatures: Glomerella cingulata, the cause of Bitter Rot, is a typical example. It does not make progress at temperatures below 50° F. The disease is common in a few orchards in the southeastern part of this state. Helminthosporium papulosum, cause of Black Pox Rot, and Mycosphaerella pomi (Brooks' Spot or New Hampshire Fruit Spot) are other examples.

3. Fungi causing spot rots in cold storage but more rapid decay at higher temperatures: Volutella fructi (Spongy Dry Rot); Alternaria spp. (Alternaria Rot); Phoma sp. (Phoma Rot); Gloeosporium sp. (Anthracnose Rot, which is similar in appearance to Bitter Rot but behaves entirely differently at cold storage temperatures); Physalospora cydoniae (common Black Rot); and Venturia inequalis (Scab).

4. Organisms capable of causing complete rotting of apples during their usual storage life in cold storage: Mucor piriformis (Mucor Rot); Penicillium expansum (Blue Mold Rot); Botrytis spp. (Gray Mold Rot); Physalospora cydoniae (ordinary Black Rot).

The storage rots most common in Massachusetts and also the ones that develop most rapidly in cold storage are Blue Mold Rot, Gray Mold Rot, and Black Rot. All make definite headway at 32° F. By comparison, Scab and Spongy Dry Rot develop very slowly.

--O. C. Boyd




## A COMPARISON OF MARCH, 1945 AND APRIL, 1944

The Führer of the Weather must have been badly shaken by world events when he ordered the weather for March, 1945. He made the unprecedented mistake of ordering April weather instead of March weather. The accompanying chart shows how closely the daily mean temperatures for March, 1945, follow those for April, 1944. The mean temperature for March, 1945 was 44.4°, or 1.5° above that for April, 1944, and 10° above the normal for March. The mean temperature for April, 1944 was 42.9° which is 2.8° below normal.

The unseasonable weather in March explains the erratic behavior of trees this spring. The period of bud breaking, leaf development and blossoming has been much prolonged. Progress was so rapid in March that some trees leafed out or blossomed. Then came cool weather, and everything almost stood still. Trees that had not blossomed during the early warm weather were held up by cool days and did not bloom much earlier than normal. These unusual conditions have also affected insects.

Trees and insects are subject to air temperature but each in its own way. Consequently unusual weather dislocates the normal relationship between different kinds of trees, different kinds of insects, and between trees and insects.

--J. K. Shaw and Irene Zatyrka

## WHENCE CAME THE NAME "STRAWBERRY?"

Several explanations have been offered for the origin of the word "strawberry." Some have associated it with an ancient custom of selling the wild fruit strung on straws of timothy grass, while others have thought the resemblance of the old, dry, runners to straw might account for the name. A popular assumption is that the name resulted from the practice of mulching the plants with straw. However, in the earliest mention of the fruit in English writings (John Lydgate, 1430) it is called "straeberry," a name believed to have come from the Anglo-Saxon word "streowberrie," which was derived from "strae" or "strahen" and means to scatter. Hence the name strawberry probably refers to the manner in which the runners are scattered or strewn about the mother plant.

The modern strawberry is truly an American fruit. Strawberries were grown in Europe several centuries ago but it was not until the Virginian strawberry from North America and the Chilean strawberry from South America were crossed in Europe, about the middle of the Eighteenth Century, that the garden strawberry began to emerge as an important fruit.

--A. P. French

## COMMERCIAL APPLE CROP PROSPECTS IN THE U.S.

Early May (through May 8) conditions suggest a much smaller United States apple production than in 1944, but probably a larger harvest than the extremely short 1943 crop. In the East and Mid-west, an unusually warm March advanced buds. The bloom was from 2 to 4 weeks earlier than usual in nearly all commercial areas. This advancement of the season prevented the usual spray program in many orchards, and insects and diseases may be a greater problem than usual. April and early May freezes killed buds and small fruits, cold, cloudy weather was unfavorable for the flight of bees, and further frost damage may occur in some northern areas. An extremely light production is probable for the area east of the Mississippi River. In the West, the season is late. May 1 prospects in this area are favorable for large crops again this year, but probably not quite as large as in 1944.

In New England, frosts on April 23 and 24 caused heavy damage to buds and bloom, and weather conditions since April 24 have been unfavorable for pollination. In New York, loss from several April freezes was spotty, with injury very severe in the Champlain area, severe in the Hudson, moderate inland in western New York, and light in orchards along Lake Ontario. Throughout the state the cold, cloudy and rainy weather was unfavorable for pollination during the unusually early and long blooming period. In New Jersey, freezes April 5 - 7 caused only slight injury to most orchards, but the freeze on April 23 reduced prospects materially. Early varieties such as Transparent and Starr are sizing rapidly. Harvest is expected to start around June 20, about 10 days earlier than usual. In Pennsylvania, conditions are spotty, with a light set on trees which bore heavily last year and with much frost damage during April in low and exposed orchards. A heavy frost on May 2 caused additional loss. In northern and western Pennsylvania counties, except Erie, apples are a near failure.

In Virginia, the crop will be extremely light and variable, largely because of the April 6 - 7 freeze, but further damage occurred in early May in the northern area. Prior to the low temperatures the night of May 2, the northern counties, especially Frederick, had more favorable prospects than other commercial areas. Very light apple crops are now in prospect in all commercial areas of the State. In West Virginia and western Maryland, damage from April and early May freezes varied greatly both within orchards and between orchards, and light crops are in prospect for both states. Codling moth had begun to show some activity on April 1, but low April temperatures reduced activity. In Delaware, apple crop prospects were reduced by early April freezes. In North Carolina, there is very little fruit remaining in the mountain counties. The State's apple crop will be much smaller than last year's large one.

In Ohio, the bloom was light, few orchards have escaped frost damage, and production will be light. In southern Indiana, early and mid-April frosts caused extensive damage to apples in a belt extending across the state from Sullivan County toward the southeast. Except in this belt, it is believed enough fruit set remains to produce better than an average crop. In Illinois, moderate damage has occurred in central and northern counties. Present prospects are favorable for Transparents, Wealthies, and Yellow Delicious, with a below average production indicated for most other varieties. Michigan apple trees were in full bloom by mid-April in most areas. Frosts and freezes on April 3, 5, 15, 22, 28 and May 1, low temperatures on most other April days, and many rainy days, resulted in a long blooming period, little insect activity, many buds killed, and poor pollination. The state's crop will be considerably below average. In southern Wisconsin, prospects are light. Favorable weather from now on might result in a good crop in northern Wisconsin, where the bloom will not be general until past mid-May. In Missouri, prospects are for a production considerably larger than last year's short crop, although early April frosts caused considerable injury. Damage was severe in the south and light in the north. In Kansas and Nebraska, early April freezes reduced prospects somewhat, especially for the early varieties. The crop in northwestern Arkansas will be short as a result of the heavy freeze of April 5, but prospects are favorable in other sections of the state. Frost damage has been moderate in Kentucky and light in Tennessee.

The State of Washington has prospects for a good-sized crop this year in all commercial areas. Lateness of the season minimizes the possibilities of frost damage. The main areas were in full bloom the second week in May. In Oregon, it seems probable that the crop will be somewhat smaller than last year. In the Hood River Valley, prospects are somewhat more favorable for Delicious than for Newtowns. California apple orchards are in good condition and have passed full bloom in all areas of low elevations but apples in mountain areas have not yet blossomed. A larger crop than last year seems probable. In Colorado, frost damage to date has been light in most areas. The Delicious variety sustained the heaviest frost damage. A somewhat smaller apple crop than last year seems likely, with the sharpest reduction in the Delta County earlier shipping area. In Idaho, Delicious and Romes show some frost damage, but there has been little injury to Jonathans. The bloom, although not as heavy as last year, was generally good. In Utah, prospects are favorable, but frost damage after June 1 is still possible in several areas. In southern New Mexico, frosts killed buds of early blooming apple varieties. However, prospects are favorable in the northern part of the state where apples were not in full bloom by the first week of May. In Montana, the cool, late spring retarded bud development, which lessens the likelihood of frost damage. Full bloom should occur during the last 10 days of May. (From the May 10 release of the Crop Reporting Board.)

AIR CONDITIONING THE APPLE STORAGE. We have some copies of a very recent progress report, Air Purification for Lengthening the Storage Life of Apples, by R. M. Smock and F. W. Southwick of Cornell University. This report is largely concerned with the use of activated carbon units to remove storage odors, ethylene, and scald gases in both cold storages and controlled-atmosphere storages. It is brief and contains conclusions rather than complicated data. Anyone interested in the control of storage scald may obtain a copy of the above publication by dropping a line to the writer at French Hall, M.S.C., Amherst, Mass.

--Lawrence Southwick

# Do You Know

That Kieffer pears ripen properly only at a temperature between 60 and 65° Fahrenheit? If held two or three weeks at that temperature, they ripen gradually and are just right for canning. But if kept warmer (80 to 100°) ripening is not hastened and the pears remain tough and poor flavored when cooked. Stored below 50°, they do not soften and are not good when cooked.

That one kind of orchid, a native of Mexico, is grown for its fruit and not for its flower? This fruit provides the most important flavoring substance which the Americans have contributed to the world. Its name is Vanilla planifolia.

That the 1944 peach crop (75,000,000 bu.) will go down in history as the most valuable crop of that fruit ever produced? It had a farm value of $171,677,000, 56% above the most valuable crop previously grown (1943). The 1944 crop was exceeded only once (in 1931), when the average price per bushel was 60 cents. The farm price in 1944 was $2.33 per bushel.

That Massachusetts offers a market for over $100,000,000 worth of farm products annually? These products are now grown on 30,000 farms, covering 400,000 acres of cultivated land. About 1,750,000,000 lbs. of food are produced annually in Massachusetts, filling 25% of the needs of our people.

That most of the grapes grown on the Pacific Coast are of European origin? They were first planted by Franciscan missionaries as early as 1769. One vine growing in California is said to have borne 15 tons of grapes in a single season.

That fully 20% of all America's crop production is the result of using fertilizers? In 1938, each dollar spent by the farmer for fertilizers produced a return of $3.60 in crop value increase. The return at present is estimated at more than $5.00 per dollar invested.

That a method of loading bees with suitable pollen is being used successfully in Missouri? Pollen of early blooming varieties of apples is screened out and stored at 32 to 40° F. until time for placing a quarter of an ounce in a beehive fitted with a device which insures ingress to the worker bee at one point and egress at another. Once loaded with the pollen, the bees cannot crawl back into the hive at the same point. Hence, they go out to seek nectar among the late blossoms thus cross pollinating reluctant varieties like Winesap and Stayman.

That heavy fruiting of the Delicious variety of apple may require an average terminal growth of 12 to 15 inches? The ideal seems to involve 40 to 60% of the spurs blooming, with only one blossom in ten setting fruit.

That the acute labor shortage has brought about the invention of mechanical arms for use in California citrus groves? A machine-powered tent puller covers citrus trees with canvas to form a fumigation chamber into which a gas is released to kill destructive insects. About 80 such pullers are now in use.

That 8 infection periods for apple scab had occurred in Massachusetts up to May 20? By that date new scab spots had appeared on apple leaves from the first five infections, April 2, 17, 25, 30, and May 3.

That some strawberry plantings in the Falmouth area show severe damage from the hurricane of last September? A shower bath of salt water from the ocean killed enough plants in exposed areas to cause considerable crop reduction.

That Japanese beetles were trapped last year in 18 states outside of those already under federal quarantine? An excellent publication, "The Japanese Beetle and Its Control" (Farmers' Bulletin No. 1856), with an illustration of the insect in color, is available.

That nicotine has been synthesized in the laboratory? But the prospects for its commercial manufacture are not bright. Rotenone and the pyrethrins have such complicated structures that there is little hope of their synthesis in the laboratory, much less on a commercial scale.

That German War Prisoners were used last fall in the Nashoba area by 75 growers, 3 cold storage plants, and 2 cider and vinegar plants? They furnished a total of 17,747 man days of labor, picked 349,551 bushels of fruit on a piece work basis and worked 31,988 hours on an hourly basis.

That at least 18 products are now produced commercially from apples? Among them are: Fresh sliced, canned, evaporated, sauce, frozen, nuggets, juice, vinegar, pectin, wax, syrup, concentrate, brandy, wine, boiled cider, and malic acid.

That the codling moth population reached an all time peak in eastern U. S. last year? One of the reasons suggested is the present heavy production of McIntosh, an annual bearing variety which is very attractive to this pest.

That the lists of new fruits published by the American Pomological Society during the past 20 years contain 3,705 names? Apples lead with 754 names, followed by peaches, 601; strawberries, 371; plums, 336; grapes, 331; pears, 238; cherries, 155; raspberries, 153; apricots, 133, etc.

That activated charcoal is being used successfully as a means of preventing scald of apples in storage? Air conditioning of the storage room is accomplished by means of canisters with sieve-like sides lined with brominated charcoal through which air is drawn by a suction fan.

That, according to federal entomologists, about eight million flowers are visited for each pound of pollen gathered by honey bees? A strong colony may gather approximately 65 pounds of pollen annually, thus providing free pollination service for 520,000,000 blossoms.

That the Oriental fruit moth first appeared in California in 1942? Every state in the Union, except North Dakota, now has this pest or is bordered by another state which is infested.

That quinces may be protected against Oriental fruit moth by bagging? Where only a few fruits are involved, this method of enclosing each individual fruit in a paper bag insures freedom from attack by this troublesome insect.

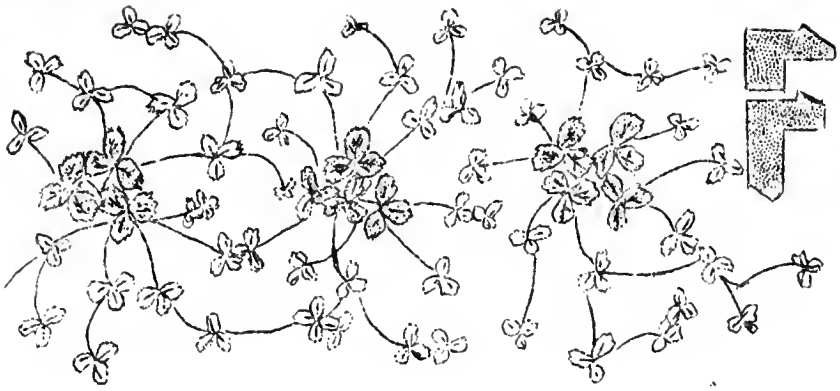
PEACH CROP PROSPECTS AT THE COLLEGE. The prospect for a crop in the College peach orchard looks much brighter than it did a week ago. During the past few warm days the little peaches have started to swell, giving an indication that some blossoms have survived the frost and poor pollinating weather. Examination after the frost revealed that 1/3 to 1/2 the blossoms had been actually killed. However, the ovaries of uninjured blossoms failed to swell so that it looked as if fertilization had failed to take place. It is now evident that in many cases failure to swell was due to the cold weather. Of course, it will not be possible to make any accurate crop prediction until after the June drop, but present indications are for a fair to good crop on many trees and some crop on most trees.

--J. S. Bailey

THE BLUEBERRY CROP AT THE COLLEGE. During the winter of 1944-45, there was severe injury to the blueberry bushes but not as bad as during the winter of 1943-44. As a result of the winter injury, the crop was undoubtedly reduced to a fourth of what it should have been. The April 23 frost also reduced the crop slightly. All open blossoms and some nearly open were killed. Fortunately, very few blossoms were open at the time so that the crop reduction amounted to 5, or at most, 10 percent. It looks now as if the crop would be about 1300 quarts, which is double last year's.

--J. S. Bailey

HERE'S AN IDEA. Assuming three things - (1) a crowded orchard, from which the owner intended to remove the extra trees but decided to leave them "one more year," (2) a crop destroyed by frost, and (3) a little spare time resulting from a shortened spray schedule, we make this proposal: That every other diagonal row be removed now (before June 15) to give the remaining trees the advantage of more light and mineral elements this summer, thereby putting them in much better condition for the 1946 crop.



# FRUIT NOTES

June 28, 1945

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



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## BETTER RASPBERRY AND STRAWBERRY PLANTS

The more we work with plants the plainer it becomes that good planting stock is worth whatever it costs over stunted or diseased plants. Trying to get the right start with the wrong plants is asking for trouble, expense and disappointment.

We have been unable to find in Massachusetts a source of plants of some of the more important varieties of red raspberries that is even reasonably disease-free. Diseased planting stock is worthless and may never bear a crop.

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Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

To remedy this situation, plans are under way to develop several disease-free nurseries within the state, in the hands of interested nurserymen who are willing to take the trouble necessary to insure a continuous supply of high grade plants.

Strawberry plants, too, will be placed under more rigid inspection, especially for Cyclamen Mite and Red Stele. Both of these pests are potentially serious and both are present in the state.

The program for better planting stock involves the full cooperation of the State College for the information it can supply, the State Department of Agriculture for a well informed and rigid inspection service, and nurserymen themselves for a real desire to improve and expand the industry.

-- R. A. Van Meter

## SOIL TYPE AFFECTS MCINTOSH COLOR

Most fruit growers in Massachusetts have received the leaflet on the Green McIntosh Problem published by the Massachusetts Fruit Growers' Association. This was necessarily brief and did not elaborate on many aspects of the problem. The bad effect of high nitrogen in late summer was emphasized. No mention was made of the relation of soil type to high nitrogen. It is easy to over-supply trees growing on the heavier soils which we commonly regard as having rather high fertility while the lighter soils rarely get too much nitrogen. These lighter soils are well drained and well aerated, so they usually lose any excess of nitrogen in the drainage water, and the nitrogen-containing organic matter is so rapidly oxidized that no great reserve of nitrogen accumulates. In late summer the nitrogen supply of the tree is therefore sufficiently depleted to permit earlier maturity and better colored fruit. It is on the more fertile soils, retentive of moisture, that we get most of the green, immature apples.

-- J. K. Shaw

## WHY SOME APPLES DO NOT SELL

It must be a painful experience for anybody who loves good apples to visit the chain stores and many other places where fruit and vegetables are exposed for sale. The contrast between apples on one hand and citrus fruits and vegetables on the other is humiliating. Oranges present an attractive appearance and in most cases are as good as they look. Most vegetables are fresh and attractive. Even green tomatoes are artificially ripened and packed in cartons. They all appeal to the eye and deplete the pocketbook. But most of the apples on display repel possible buyers and properly belong in the cull pile; yet the price is enough to warrant decent quality. Many think that such apples should not be allowed in the market place. Certainly they are not worth the price asked. Unless something is done about this situation, the apple business is on the way to the abode of sinners. We have talked about it a lot. Why not do something about it?

-- J. K. Shaw

A MODERN WITCHES' BREW

The fruit grower of the future may have in his wood shed a shelf on which will be a collection of bottles containing various brews from which he will select the proper ones and spray them on his trees. Then he will be free to attend the dog races (?) until harvest time, when he will come home and harvest a big crop of perfect, red apples which he will sell at $10.00 per box, and then be in a position to replenish his supply of magic concoctions and resume his life of ease and enjoyment.

This may be a bit exaggerated, but how is this for a starter? -- A material which promises to accomplish all of these things: (1) serve as a blossom thinning spray, (2) prevent excessive fruit bud formation, (3) delay blossoming until after frost danger has passed and extend the harvest period of McIntosh, (4) prevent premature drop of the fruit, (5) solve the green McIntosh problem by turning the apples yellow in two weeks' time, and (5) serve as a killer of unwanted weeds. These varied effects are brought about by varying the concentration and time of application. This, too, may be a wee bit stretched, but all these varied uses are within the realm of possibility. You will hear more of this story in the near future.

-- J. K. Shaw

PICKING FRUIT (Some general suggestions from work simplification studies)

1. Arrange the job so that both hands can work. Equal use of both hands usually increases output by about 40% over using one hand alone.

2. Keep both hands together for greater hand-eye coordination. The eyes cannot direct both hands if the hands reach out in opposite directions.

3. Fill the hands full before moving them to the container. On hand harvest jobs as much as 70% of the picking time is spent in moving (transporting) the fruit from the tree to the picking container. By getting the hands as full as possible, this transport time is reduced.

4. Keep picking container - basket, bag or pail - as near the hands as possible. By keeping the container conveniently located with respect to the hands, transport time and extra steps can be reduced.

5. Use a picking container adapted to the job. For apple picking, a lightweight picking bucket of full-box capacity attached to the worker with comfortable harness speeds up the job and makes it easier.

6. Approach any hand harvest job in an orderly fashion. When picking fruit (apples, peaches) from the ground, pick the highest fruit first so that the decreasing weight on the branches will not cause the fruit to spring out of reach. Size up a tree before setting the ladder to pick the tree with a minimum number of ladder moves.

7. Simplify the task of removing the harvested crop from the field. Have adequate field roads. Where possible, locate the boxes at frequent intervals so that the filled picking containers do not have to be carried long distances.

8. Give inexperienced workers clear, complete instructions on how you want the job done. Indicate who is to be responsible for each job and instruct him in his specific responsibilities.

-- Roy E. Moser

COST OF FERTILITY

Each year thousands of tons of plant nutrients are lost from Massachusetts soils through erosion. Some of this is by physical erosion, plainly visible to the discerning eye; some by invisible erosion which only the chemist can detect. To plug the hole caused by current losses and to restore deficiencies created through years of exploitative farming, farmers in this state each year use thousands of tons of fertilizer, lime, and manure, costing millions of dollars.

According to a recent bulletin issued by the Massachusetts Experiment Station, another record was made in the use of soil amendments in this state in 1944. 89,837 tons of mixed fertilizers, fertilizer materials and chemicals, and commercial pulverized animal manures were used. This amount is slightly higher than that for the preceding year. In addition, Massachusetts farmers annually apply between 50,000 and 60,000 tons of ground limestone and more than a million tons of animal manures, and plow under between 30,000 and 40,000 acres of green manure crops, all of which have a total money value between $6,000,000 and $7,000,000.

With this great investment in materials and labor for soil improvement, it is only common sense to protect the investment by conserving the improved soils. Losses through water erosion, wind erosion and to some extent chemical erosion, can be totally prevented or reduced by following such conservation practices as cover cropping, contour farming, strip cropping, and terracing. Conservation practices conserve moisture as well as soil and fertilizer. Increase in yields of 10 to 15 percent may be expected from the adoption of conservation methods.

-- A. B. Beaumont

FROST AND THE PREVENTION OF FROST DAMAGE. This is the title of Farmers' Bulletin No. 1588 which may be obtained from the State College. Midsummer is an unusual time to talk about frost prevention but it is none too early to begin preparing for next spring. Any grower interested in a readable discussion of this important subject should obtain a copy of the above publication, and become familiar with the fundamental principles.

MAY AND JUNE RAINFALL IN AMHERST. Rainfall in May amounted to 6.45 inches and in June (up to the 25th) 7.53 inches. The normal for the two months is 3.6 and 3.75 respectively. Some rain fell on 17 of the first 24 days in June. If one were planning the weather for apple scab infection he couldn't improve on what the weather man has given us in 1945.

# Do You Know

That, except for size, the apple maggot and the blueberry maggot are even more alike than so-called identical twins? In all stages of development, egg, larva, pupa, and adult, according to F. H. Lathrop, Maine Entomologist, the blueberry maggot is two-thirds as large as the apple maggot. If the former is transferred to an apple it is able to attain full development, while an apple maggot may require two or three blueberries. This raises the question whether or not a large fruited variety of cultivated blueberry may provide a suitable food supply for the apple maggot even though the wild blueberry can support only the smaller strain of this insect.

That, under certain weather conditions, fire blight may be transmitted by the wind? Although insects have long been considered as the sole disseminating agents, recent experiments have shown that the bacteria may ooze out in the form of long, slender, gelatinous filaments which dry into hair-like strands and are broken off and blown away. Just how far the strands may be blown, how long the bacteria remain alive, and how important these structures are in the spread of the disease have not been determined.

That McIntosh twig growth has in some cases been killed by apple scab? According to Donald Folsom, Maine Plant Pathologist, "The only way to prevent scab infection of the new twig growth is to keep the twigs covered with a fungicide until midsummer, when the elongation has stopped and the bark has reached a certain stage of maturity. Sulphur dust has proved somewhat better than other fungicides."

That the Golden Jubilee of the Delicious apple is being celebrated this year and the Elberta peach has now reached its 75th birthday? If, according to J. K. Shaw, 50 years are required for an apple variety to justify itself, the Cortland will be on trial for a few more years. The original Ben Davis x McIntosh cross was made in 1898 but the seedling did not fruit until 1906 and was not generally introduced until 1915. This variety fruited for the first time in the College orchard during the early 20's.

That a definite relation exists between the color of apple leaves in late summer and the nitrogen content of the tree? Since the supply of nitrogen in late summer has a definite bearing on fruit color, it is reasonable to assume that apple growers will in future years become more conscious of the shade of green in the leaves as an indicator of the nitrogen needs the following spring.

That the Food and Drug Administration has adopted a tolerance of DDT on fruits similar to that of lead and fluorine? On the basis of available data there is general agreement that DDT is not more toxic than either lead or fluorine. The informal tolerance for lead on apples and pears is 7 milligrams per 2.2 pounds.

That in Colonial times 90 out of every 100 people in this country had to work on farms to grow enough food? Today the ratio is just reversed. Then one man could take care of about five acres of corn. Now he can handle 100 acres. In 1909 it required 12.7 man hours to grow an acre of wheat. Today it takes 3.3 man hours. Despite this progress many farmers are still under equipped for the 1945 job. To say that some fruit growers are working under the handicap of antiquated equipment is a mild understatement.

That a fertilizer application may show an effect for at least 8 years? In Missouri a section of a prairie meadow was fertilized in 1936 by top dressing with various commercial fertilizers in amounts up to 600 pounds per acre. Each year since that time the hay from the fertilized areas and from an unfertilized check area has been cut and stacked separately. Cows have been allowed to feed on those stacks which were most attractive. Up to 1944 they invariably fed on the hay from fertilized areas and even after that date they chose to visit the fertilized areas where they found the pasturage more attractive. In an orchard there is reason to believe that the grass resulting from a broadcast application of a complete fertilizer exerts an indirect benefit on the trees over a period of at least 10 years.

That two fruit crops unknown in this country 40 years ago were consumed in large quantities in 1944? An avocado crop of 23,200 tons from Florida and California, and a grapefruit crop of 56,020,000 boxes were included in the nation's diet. David Fairchild, veteran plant explorer, in looking back over his 40 years of studying and introducing fruits and vegetables from all parts of the world, recalls clearly the early prejudice and resistance against these fruits at the time of their introduction.

That 200 tons of citrus pomace will be put up this year at a plant in Florida? Apple growers supplying the pomace market may expect real competition from citrus fruits after the war. The citrus product seems to be especially suitable for making marmalades, jellies and gelatin desserts.

That the light set of Delicious, commonly reported by apple growers, may be due in some cases to a peculiarity in the structure of the Delicious blossoms. R. H. Roberts, Wisconsin Horticulturist, says, "It was observed that a peculiarity of the Delicious blossom structure permits honeybees to extract the nectar without pollinating the blossoms. This was true in approximately 80% of the bee visits this season." His observations seem to indicate that honeybees are able to obtain the nectar without actually contacting the anthers and stigmas.

That the light crop of apples throughout the Northeast is due as much if not more to faulty pollination as to frost injury in the blossoms? A. B. Burrell, New York State Plant Pathologist, reporting from Essex County, says, "While freezing injury to blossom buds was severe, pollination appears to have been a still more important factor in limiting the set. In many cases, the favorable effect of the trees of a suitable pollinizer variety, is restricted largely to adjacent McIntosh trees, the second tree away being conspicuously light. It is the first time we have seen this extreme localization of pollination."

## SEEN AND HEARD IN MAINE

It was the writer's privilege to spend the week of June 11 attending a series of orchard tours and twilight meetings in Maine. Following are a few random observations:

Oyster shell scale. In several orchards this insect has assumed the role of a major pest. The eggs were just hatching and the young scale insects were settling down in enormous numbers particularly along the base of the current season's growth. Twig killing was observed in two orchards. A nicotine spray timed after the eggs had hatched should prove quite effective this year since the hatching period was shorter than in years past. An experiment with Summer DN and other materials is under way. Moose damage. In one young orchard in Monmouth, invaded by a moose last spring, browsing was observed up to a height of about 8 feet. Deer are also causing much damage and growers are seeking relief in the form of hunting permits, 15 of which may be granted for an individual orchard. Crop prospects. Maine growers suffered less damage from frost than was first reported. The apple crop promises to be about half normal. Of the orchards visited several showed a 75% set while others were much lower. The May snowstorm caused much breakage. One grower said he spent two days hauling brush out of the orchard after the storm. Apple scab. Conditions are very similar to those in Massachusetts. May and June have been very rainy and some scab is showing up in most orchards. A heavy infection was observed in certain orchards where too few sprays were applied. One grower obtained good scab control with four dusts and one spray. Magnesium deficiency. Most growers are applying epsom salts as a spray. Where this material is used in combination with lime sulfur a heavy black sludge is observed. There is a growing tendency to use wettable sulfur or sulfur dust instead of lime sulfur.

## CONTROL OF ORIENTAL FRUIT MOTH

Owing to war conditions, it was impossible to carry through the program of rearing Macrocentrus parasites for Massachusetts growers. Because of labor shortage and the interruption of normal transportation facilities, it is doubtful whether the program can be resumed until the termination of the war.

Recent experiments indicate that the sulfur-oil-talc dust (which is available commercially) or a nicotine-bentonite spray such as Black Leaf 155 at 3 pounds to 100 gallons of water shows promise in checking the pest. The recommended schedule calls for four applications at 5-day intervals beginning three weeks before harvest.

-- A. I. Bourne

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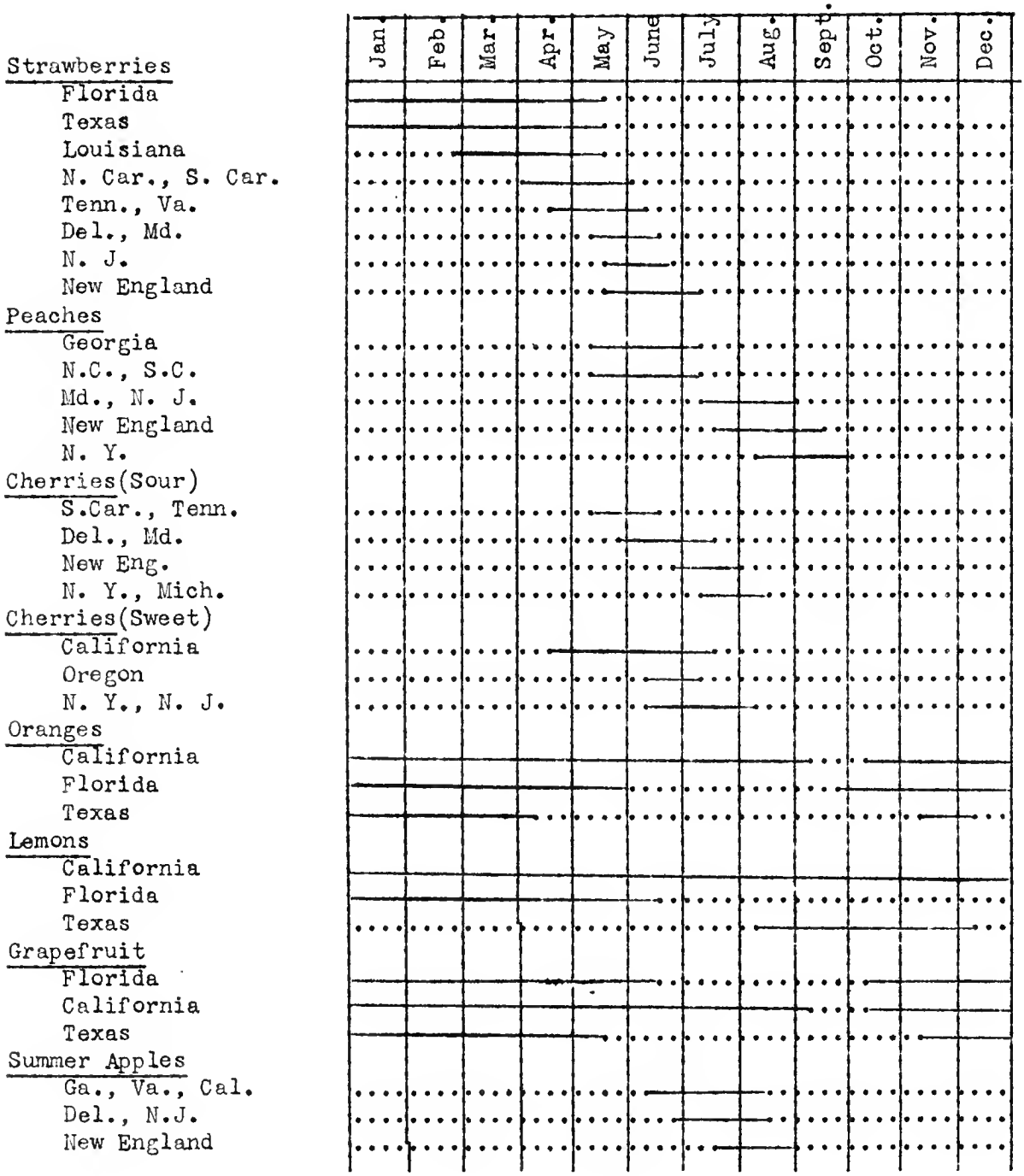
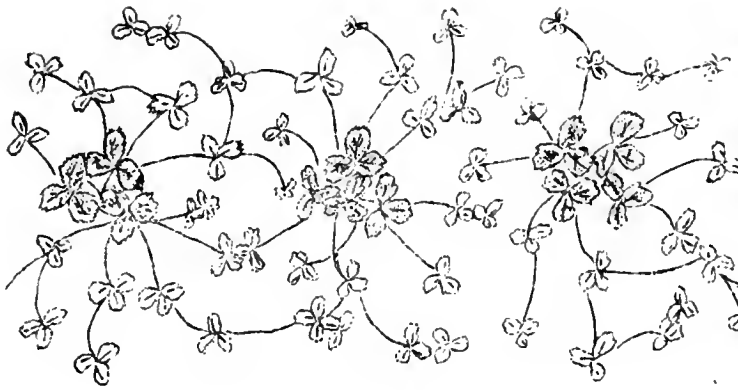
Your State College at Amherst is a busy and thriving institution of higher education. It is not only the focal center in Massachusetts for information on farming but it is an excellent place for your boy or girl to get a good basic education, whether or not he or she is interested in Agriculture or Horticulture. The College Catalog outlines all of the four-year courses; the catalog of the Stockbridge School of Agriculture explains clearly the curriculum of the two-year course in Agriculture and Horticulture. A note to the College will bring them both.

## HARVEST SEASONS OF PRINCIPAL FRUITS
Sold along the Atlantic Seaboard





# FRUIT NOTES

July 31, 1945

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

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## WEATHER IN RELATION TO FRUIT CROPS

"Everyone talks about the weather but no one does anything about it." That classic remark of Mark Twain's was never truer than this year. However, since the weather is such a vital factor in farming and every farmer must be interested in it whether he likes it or not, a few remarks on the cussedness of the present season should not be out of place.

The following table gives the normal and 1945 precipitation in inches at Amherst through July.

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Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

| | Jan. | Feb. | Mar. | Three months | Apr. | May | June | July | Four months | Total to Aug. 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| Normal | 3.61 | 3.19 | 3.70 | 10.50 | 3.35 | 3.60 | 3.75 | 4.10 | 14.80 | 25.30 |
| 1945 | 3.07 | 3.33 | 2.16 | 8.56 | 5.43 | 6.45 | 7.67 | 7.36 | 26.91 | 35.47 |

During the first three months of the year precipitation was practically two inches below normal. In April the heavens opened and have been "pouring it on" ever since. The excess for April through July has been 12.11 inches, making the excess for the seven months of 1945 10.17 inches.

This heavy rainfall, together with hot, humid weather during June and July, has made the control of many diseases on both fruits and vegetables very difficult. This has been the worst apple scab season in years. Orchards which were not frequently and thoroughly sprayed are heavily infected. Also carry-over for next year will be heavy. Brown rot of peaches and plums has been severe, particularly on susceptible varieties. The mummy berry disease of blueberries, a very close relative of the brown rot of peaches and plums, has been unusually severe on both wild and cultivated berries. Because of this disease and the depredations by birds, the College blueberry crop will be far below early estimates.

A good raspberry crop was in prospect but the repeated rains caused many berries to mold on the bushes or to become soft and worthless.

Several unusually heavy rains during June and July have made insect control more difficult by washing off arsenicals soon after they were applied. This has been especially true of codling moth control during July.

Because of the light crop and abundant moisture apples are sizing up more rapidly than normal. The prospect is for many over sized ones of poor keeping quality.

-- J. S. Bailey

## KILL THE CHOKECHERRIES

If you are growing peaches and don't want the X-Disease, get rid of the chokecherries . Now is a good time to do it with a weed killing spray. The X-disease, or Yellow-Red Virosis, is a virus disease which spreads readily from chokecherry to peach but not so easily from peach to peach. Therefore it is very important to eliminate all chokecherries within 200 feet of a peach orchard.

The chokecherry is a very persistent thing and will sprout from any pieces of root left in the ground. Attempts to get rid of it by mowing or digging are ineffective. The surest means is a weed killing spray.

New weed sprays have been put on the market recently and will probably be made available next year. Although several of these are being tried at the College, it is too early to draw any conclusions. From past experience, the type of material containing ammonium sulfamate appears to be most effective. It should be used according to the manufacturer's directions.

-- J. S. Bailey

## THE POISON IVY PROBLEM AND ITS SOLUTION

Poison ivy need not be tolerated in orchards now that adequate means for killing it out are available. Every year many orchard workers are affected in varying degrees from minor localized irritation to serious poisoning requiring doctoring and hospitalization as a result of being poisoned by this obnoxious plant. Incidentally, poisoning takes place only by direct contact. When poison ivy is established under and on fruit trees, it is very difficult to harvest the fruit without coming in contact with the ivy. And for persons who are susceptible to ivy poisoning, it is rather foolhardy to take a chance. Considering the scarcity of harvest labor, it is very much to the advantage of fruit growers to extorminate the ivy in order to eliminate this cause of picker dissatisfaction. Several materials, usually to be applied as sprays, can be used for this purpose.

In orchards at the Massachusetts State College and in a number of commercial orchards, poison ivy has been treated successfully with ammonium sulfamate. One application in midsummer has usually killed most of the ivy but often there is partial and spotty recovery the following season. A follow-up application the second year should be made wherever ivy is present; otherwise, it may again become vigorously established. There are other materials, such as the complicated new "hormone" chemical known as 2-4-D, which are promising. In any case, chemical sprays should be applied preferably on warm sunny days and while the ivy is growing well. Following the application, no further measures need be taken at least until the following season when some recovery may or may not show up. Care should be taken not to get the spray on the foliage of the fruit trees.

--Lawrence Southwick

## WHY POOR APPLE QUALITY?

A study of the defects causing poor apple quality was made by the New York State College of Agriculture, Department of Agricultural Economics, from data collected at a fruit auction and at retail stores. Surface bruising was by far the most prevalent defect. In fact, practically every lot sampled contained bruised fruit. This emphasizes the vital importance of handling apples with utmost care from the tree to the consumer.

Lack of good color was the second most frequently observed defect with two-thirds of the lots failing to meet color standards. Apple scab, stem punctures, and codling moth stings were each evident in one-half or more of the lots sampled. Red bug stings, russeting, leaf roller injury, limb rub, and dirtiness caused somewhat less severe damage. (From Farm Economics, May 1945.)

--Lawrence Southwick

APPLE MAGGOT FLY EMERGENCE. The peak of emergence in the Waltham cages occurred on July 19, according to W. D. Whitcomb. By that time 75% of the expected total of flies had appeared.

INCREASE IN APPLE PRICE FOR THE EAST (From July 28 issue of The New York Packer)

The ceiling price of fresh apples during the period beginning July 21 and ending August 19 will continue to be $3.45 a bushel, f.o.b. shipping point, but in all states east of Ohio, Kentucky, Tennessee and Alabama an additional allowance of 25¢ a bushel is made to cover further losses from reduced yields, the Office of Price Administration said this week.

The f.o.b. shipping point ceiling will be $3.70 a bushel for apples grown in the states of Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia and Florida.

The $3.45 ceiling price which applies to the remainder of the country includes a "disaster" allowance of 30¢, effective as of June 21. That increase resulted in the retail ceiling price of fresh apples being increased about a fourth of a cent a pound.

The additional increase of 25¢ a bushel granted this week for apples produced in the eastern seaboard states will increase the retail ceiling price for those apples another $\frac{1}{4}$¢ a pound, making the total retail increase about $\frac{1}{2}$¢ a pound.

The price increases which apply to fresh apples are mandatory under the Stabilization Extension Act, which provides for increased ceiling prices when yields are substantially reduced by unfavorable growing conditions.

The additional increase in the eastern states is necessary because the reduction in yield in those states is greater than in other sections of the country. (Amendment 132 to Maximum Price Regulation 426 - Fresh Fruits and Vegetables for Table Use, Sales Except at Retail - effective July 21, 1945.)

APPLES PREVENT SPROUTING OF POTATOES IN STORAGE

The following interesting experiment is reported by Donald Folsom of the Maine Agr. Exp. Sta. in the May issue of Maine Fruit Notes.

"The unusual warmth of April has started potatoes to sprout unusually early in storages that ordinarily are cold enough to hold back sprouting. Apples give off a gas that holds back the growth of potato sprouts as long as they are exposed to the gas. As an example, at Highmoor Farm many seedling potatoes were put into the apple storage in mid-April after they had developed sprouts several inches long in a potato cellar. Today, May 25, these sprouts are no longer than they were in mid-April. They have developed a hard, round head on each sprout and, judging from the past experience of other seasons, will not resume growth as long as apples are left in the same storage or until the potatoes are taken out and planted. This principle can be used to keep eating potatoes from wasting their strength on sprouts. The idea was discovered and studied scientifically in Kansas and England. The gas involved is thought to be the same gas that is used to ripen oranges and other fruits artificially."

DO YOU KNOW - - - - - -

That the Plum Curculio is a minor pest of some consequence in cultivated blueberries in New Jersey? W. E. Tomlinson, formerly of the Waltham Field Station who is now engaged in blueberry insect work at Pemberton, N.J., forwarded sample blueberries to Waltham early in June, 1945, and typical curculio larvae have emerged from them. The infested blueberries were marked with the characteristic crescent shaped scars which are so noticeable in infested apples and plums. C. S. Beckwith, formerly entomologist and director of the Cranberry and Blueberry Insect Investigation Laboratory at Pemberton, N. J., previously reported infestations of this insect in blueberries in 1938. Wild blueberries are not known to be attacked. (W. D. Whitcomb).

That the word "blueberry" is used to designate a group of plants commonly called either blueberry or huckleberry the fruit of which has many small, soft seeds in contrast to the true huckleberry which has ten large, hard shelled seeds? In addition to the high bush blueberry (Vaccinium corymbosum) and the low bush blueberry (V. angustifolium) four other species of blueberries are of importance in the United States, the dry land blueberry (V. vacillans) and the rabbiteye blueberry (V. virgatum) of the Southeast and the evergreen or box blueberry (V. ovatum) and the mountain blueberry (V. membranaceum) of the Northwest. The value of the low bush blueberry alone is estimated at $5,000,000 annually.

That the state of Missouri, which according to the 1900 Census, had a total of 20,000,000 trees, ranked first in apple production at that time? The following states ranked next in order with numbers of trees ranging from 15 million to 8 million; New York, Illinois, Ohio, Kansas, Pennsylvania, Michigan, Kentucky, Indiana, Virginia. It will be noted that the state of Washington which today produces about one-fifth of the apple crop, was not included in the first ten states 45 years ago.

That the oldest living grape vine in the United States is said to have been planted in 1587 near Manteo, N. C? According to tradition this Scuppernong vine was brought over by a group of colonizers sent on an ill fated mission by Sir Walter Raleigh. Many thousands of cuttings have since been taken from this mother vine, a 125-acre vineyard having been planted nearby. The old mother vine, rambling from its giant, gnarled trunk over nearly an acre, is said to yield as much as 150 bushels annually.

That a strawberry plant, with its progeny of runner plants, is capable of producing at least one quart of berries. On an acre basis this would result in only a fair per acre yield. If plants are set 5 x 2 feet apart, such a planting involves 4,356 plants per acre. The average production in the Falmouth area in 1944 is reported to be 3,569 qts. per acre. In 1940 the yield was 4,600 per acre.

That the widely publicized insecticide, DDT, is effective over a long period of time because it is not soluble in water and does not evaporate or volatilize appreciably? DDT is effective against a wide range of insect pests but there are a number of pests against which it works only moderately well or is quite ineffective. An insect can apparently absorb DDT through its feet. Hence, a small deposit where the insect walks may prove effective.

That an airplane has been used successfully in spraying an orchard with one of the plant hormones to prevent premature apple crop? Two hours were required to spray a 40-acre block. Using a high concentration in oil emulsion, only a pint per tree was said to give complete coverage because of high atomization and high air turbulence from the plane's propeller.

That the prices of all commodities bought by farmers in May of this year were, on the average, 44 percent higher than in 1935-39 while farm wage rates in May were about three times as high as they were in 1935-39. U.S.D.A. figures on farm wages are shown in the following table.

| | Annual Average 1910-14 | Annual Average 1935-39 | June 1, 1942 | June 1, 1945 |
|---|---|---|---|---|
| Per month, with board | $22.09 | $26.01 | $42.93 | $81.28 |
| Per month, without board | 29.18 | 34.17 | 52.79 | 93.10 |
| Per day, with board | 1.16 | 1.23 | 1.89 | 3.65 |
| Per day, without board | 1.42 | 1.50 | 2.11 | 4.16 |

That less than 10% of the nation's retail stores are equipped to handle frozen fruits and vegetables? In view of the tremendous expansion in this field (more than 500,000,000 pounds were packed last year), the prospects for post war development are tremendous.

That a 4-H Club project in Grainger County, Tennessee added 235,000 pounds of wild blackberries to the national supply of fruit last year? More than 500 4-H Club members took part in this project. The pickers received 7 cents per pound for the berries, 1 cent going to the club which received, crated, and paid for the berries. 7,500 checks, amounting to $16,000 were issued, some families receiving as much as $200.

That the irritation due to poison ivy may be relieved by painting the skin with a ferric chloride solution made as follows: Tincture of ferric chloride, 20%; Glycerine, 50%; Water, 30%? It is said that this material will reduce the inflammation and irritation and control their spread to other parts of the body.

That the Office of Price Administration has recently set up a tentative schedule to govern the lifting of price controls in three important catagories affecting the farmer? While no specific dates have been set, controls are to be lifted in the following order: (1) Basic materials whose output has been greatly expanded during the war, including aluminum, copper, and zinc are in this first class. Also to be among the first products to be freed from the ceiling are fresh fruits and vegetables, and cereal products. (2) Steel, machinery, castings, most paper products, rubber goods, soap, household goods, home furnishings, clothes, shoes, meats, processed foods, and later sugar. (3) Building materials, household appliances, automobiles and furniture.

That yields of apples in 131 Yakima and Wenatchee orchards in central Washington reached a new high of 500 boxes per acre in 1944 as compared with 374 in 1943? These growers produced 1,608,401 boxes of apples at an average cost of $1.41 per box.

That a single application of nitrogen applied in an apple orchard in early spring has been found as effective as splitting the amount and applying half of it later? A single early application is found to be more effective than the same application made in late spring.

That the per capita annual consumption of apples decreased from 68 pounds in 1910-1914, to 43 pounds in 1935-1939? Citrus fruits offer the strongest competition. Their consumption during this period increased from 19 pounds per person per year to 49 pounds. Bananas and other fresh fruits (mainly peaches, grapes and pears) have not shown any marked trends in this regard. The per capita consumption of bananas has fluctuated between 15 and 25 pounds. Of citrus fruits, oranges are still liked best and are used in grea test volume, though grapefruit showed an eightfold increase in consumption from 1.4 pounds per capita in 1910-1914, to 11 pounds in 1935-1939. Even lemons seem to have gained in popularity.

That the word "fruit" from a horticultural standpoint is defined as "The edible pulpy mass covering the seeds of various plants and trees, as the orange, apple, pear, berry, etc." and from a botanical standpoint, "The matured seed and its contents, together with such accessory or external parts of the inflorescence as seem to be integral with them"? The seed of a dandelion is therefore as worthy to be called a "fruit" as a luscious peach.

That some rain fell in Amherst on 53 of the 92 days of May, June and July? The excess rainfall for the first six months of 1945 amounts to more than 10 inches.

That a white form of the common blackcap is sometimes found growing wild? A few days ago a former student dropped in at the State College with a sample of these berries gathered on Mt. Toby. The fruit is amber yellow in color and is technically known as Rubus occidentalis, variety pallidus.

That the genus Prunus, one of the sub-divisions of the Rose Family which includes plums, cherries, peaches, nectarines, apricots and almonds, is divided into no less than 82 distinct species of plants? Many of these species are again divided into large numbers of varieties.

That a fairly definite relationship exists in most orchards between the percentage of apples in different grades and the fact of closely or widely spaced trees? The following table taken from Bulletin No. 443 of the Washington Agricultural Experiment Station brings out this relationship.

| Zone of tree top | % "Extra Fancy" | | % "Fancy" | | % "C Grade" | |
|---|---|---|---|---|---|---|
| | Close | Wide | Close | Wide | Close | Wide |
| Ground to 5 feet above | 0 | 31 | 4 | 48 | 96 | 16 |
| 5 to 10 feet | 7 | 35 | 39 | 56 | 54 | 8 |
| 10 feet above the ground to top | 65 | 79 | 24 | 18 | 10 | 2 |

That the forerunners of our present large strawberries were first introduced to Europe in 1712 from Chile? In August of that year five plants arrived in France which, together with later importations, laid the foundation for strawberry growing in Europe. Later these plants were crossed with pollen from European and North American species and from the seed secured, a new race of large fruited strawberries originated, better than anything previously known.

That apple varieties vary considerably in their content of Vitamin C? A variety under study in New York State is found to contain about 10 times

as much as is normally found in an apple. Incidentally, the addition of synthetic Vitamin C is said to prevent browning of dried or frozen peaches?

That careless practices of food shoppers, principally women, cause an annual loss of more than 8,000,000 pounds of fresh fruits and vegetables. By handling food thoughtlessly and roughly, purchasers spoil perhaps 1500 tons of peaches, 4500 tons of tomatoes, and large quantities of other perishable foods every year. The above mentioned 4000 tons would supply the full needs of 143 army divisions for a week.

That a milky disease spore dust offers much promise in the control of Japanese beetle. The purpose of the product is to inoculate the soil against the grub by introducing into the treated area a disease that kills quickly and multiplies rapidly. Its application is simple and the inoculation remains effective for many years. Under normal conditions subsequent treatments are not necessary.

That one of the big problems of the McIntosh grower, probably next in importance after scab control, is that of regulating the nitrogen application in such way that he obtains the highest production consistent with good fruit color? Since leaf color is directly related to this problem, a set of new color charts which bear 7 shades of green should prove useful in years to come. These charts range in color from a greenish yellow to a dusky olive green and are based on leaves taken from McIntosh trees which were under known nitrogen treatments for three years.

That Connecticut growers are suffering some damage this season from the 17-year locust? Damage to young trees is caused by the egg laying punctures in the branches. One grower is reported to have wrapped the young trees in a 40-acre orchard with totacco cloth to avoid damage from this pest.

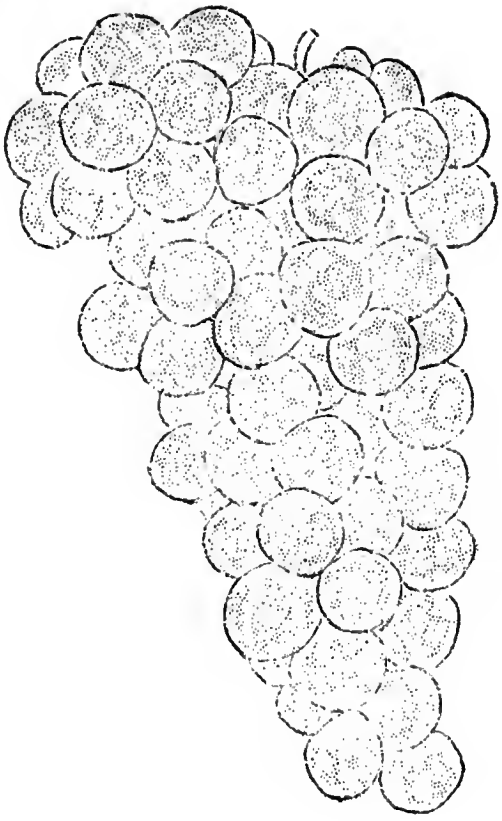
## BLUEBERRY "STUNT" DISEASE

The blueberry "stunt" disease has recently been found in Massachusetts. This disease is very serious in North Carolina and New Jersey where it sometimes spreads very rapidly. It has been found also in New York and Michigan but is spreading very slowly or not at all in these states and in Massachusetts.

The "stunt" is a virus disease transmissable by budding, grafting or cuttings. Although it is probably spread by some insect, the exact manner of spread is not known.

Diseased plants are stunted in their growth, leaves are mottled, cupped downward, and stunted, fruit is small, bitter and useless. Diseased plants should be removed as soon as found and burned.

-- J. S. Bailey



# FRUIT NOTES

August 31, 1945

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## SOIL CONSERVATION IN THE ORCHARD

"It seems to me that some areas are ideally adapted to the contour orchard, while other sites are totally unadapted," opines a leading authority on orchard management. Quite right. The fairly regular slope, even if curved, lends itself to contour planting. The roly-poly, hummocky topography, however, is not adapted to contour planting. It happens, however, that the soil types of New England best suited for orchards have fairly regular slopes. The hummocky, irregular topography is more likely to occur in the soil types ill adapted to orcharding, such as Hinckley.

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Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

Contouring helps conserve soil, moisture and fertilizer in the cultivated orchard, and likewise to a less extent in the sod orchard. In either cultural system orchard equipment can be more easily and less expensively hauled on the contour than up and down hill. However, the freedom of movement is largely restricted to the horizontal; this is almost necessary anyhow on slopes greater than 15 per cent. Provision must be made for turning at the end of contour rows. Sheet erosion occurs on all sloping cultivated land. It is often so imperceptible as to be hardly noticeable. Its effect is cumulative and serious in the end. It is not uncommon to find as a result of sheet erosion during the years that good topsoil has accumulated to a depth of several feet at the foot of a long slope. Another type of soil erosion that orchardists often have to contend with is road erosion. In many cases this type of erosion can be reduced to negligible proportions by proper road placement through careful planning in advance of planting.

Orchardists of this state having problems of soil conservation and land improvement, and most of them do have such problems, will be interested in the possibilities in these fields through soil conservation districts. The soil conservation enabling act, recently passed by the Massachusetts Legislature, makes it possible for farmers of a given area to organize soil conservation districts. Through districts technical service in conservation can be obtained free of charge, and the use of heavy equipment of different kinds can be obtained at low cost. Many advantages may accrue to farmers through districts. The fist step in obtaining a district is to file with the State Soil Conservation Committee a petition bearing the names of a number of land occupiers in the area under consideration.

-- A. B. Beaumont

## A RECORD SHORT APPLE CROP

What a pity this year, when there is need for every possible pound of food, that Massachusetts, New England, and practically the entire East should suffer such a disaster in connection with apple crop prospects! It has been a case of down, down, down, all season. Ever since the frost first struck, following that "August weather in March," there has been a series of wallops including serious lack of pollination, heavy drop, wet, scabby weather, all of which have taken their toll of merchantable fruit which will be available this season.

It now sums up to the shortest crop in New England since 1910. It is even smaller than the 1921 crop which we old timers thought was a terrific disaster.

As it stands at this writing, the apple crop in the entire North Atlantic area, including New England, is only a little more than 10 million bushels compared with about 35 million last year. In the South Atlantic States, which takes in the very important Virginia section, the reduction is from 23 million last year down to a meager 6 million this year. In the Central States it is about 50% of a crop, from about 18 million to 9 million.

While it may sound disloyal for an old Yankee to say it, the place for an apple man to live this year is in the Pacific Northwest. Out there they have a real crop. They have had some awful tough times during the depression, but in the past few years they have come back strong and this year's nice crop, benefitting from higher prices as a result of the eastern shortage, should make apple selling a nice proposition for western growers.

To sum it up, the estimates as compiled in August show a United States crop of 68,882,000 bushels, compared with 124,754,000 last year and 119,046,000 for the ten-year average.

In view of the short crop, some comment here on the apple ceilings seems quite appropriate. The "disaster" adjustment to the ceiling prices, which is effective through September 30, makes the price in the eastern states $3.85 per bushel f.o.b. to growers, and $3.95 to growers' sales agents and to growers who qualify as shipping point distributors (which many in New England do). This ceiling applies to all the East and to some Western States, but does not apply to the Pacific Northwest. In California, Washington, Oregon, Montana, and Idaho, the ceiling is $3.19 to growers, $3.29 to growers' sales agents, and shipping point distributors.

The mark-ups as scheduled at present are the same as last year. For sales in the market there is a mark-up of 40 cents where sales are on commission (and 30 cents if the shipment is from a shipping point distributor or growers' sales agent). For apples which are owned by the seller in the market the mark-up is 45 cents. For apples delivered to retail stores the mark-up is 70 cents. In all of these cases the cost of transportation may be added.

The $3.85 figure applies on standard containers, which includes the eastern apple crate and the Massachusetts standard box. Where apples are sold in non-standard containers, the f.o.b. price is 8.56 cents per pound for graded and packed fruit.

-- Walter E. Piper
Massachusetts Division of Markets

## DICHLORO - DIPHENYL - TRICHLORETHANE

The end of the Japanese War and increased production facilities undoubtedly mean that DDT will be available to civilians in larger quantities in 1946, and Massachusetts fruit growers are already wondering how to use it in their orchard insect control schedule.

Although about 25 years of normal experimentation have been croweded into the last three years, there are many things about DDT which are not yet known. Furthermore, the extremely unusual growing season in 1945 will cast a reasonable doubt on the results of this year and we wonder if they can be repeated in a more normal season.

Most of the preliminary results have been favorable, and a dosage of 1 pound of DDT in 100 gallons of spray is generally accepted as most desirable on fruit trees. At this rate, outstanding control of codling moth, leafhopper and Japanese beetle has been obtained. DDT appears to be exceptionally compatible with other insecticides and fungicides and promises to provide many desirable combinations. Preliminary experiments indicate satisfactory compatibility with Fermate or Puratized for scab and other diseases; with DN for red mite; with nicotine for aphids; and with lead arsenate for plum curculio. It is safe on peaches and we expect to develop a satisfactory schedule against the Oriental fruit moth.

Some reports show a lack of uniformity in the manufacture of DDT, and chemists have found the presence of isomers which are chemical mixtures containing identical elements in similar proportions but in different arrangement and varying in their action.

DDT has already been micronized, fused with sulfur, dissolved in paint, and sprayed onto carrier particles to form a dust. Many other formulae, processes and combinations will be made before the most satisfactory form for each purpose is established.

The effect of DDT on other animal life is being thoroughly studied. Some birds are killed by eating poisoned insects or by drinking impregnated water. Many native pollinating insects will be killed, especially where flowering cover crops are grown in the orchard.

We are confident that a practical and profitable schedule for using DDT in orchards can be worked out. But, please, be patient. Give us time.

-- W. D. Whitcomb

## OYSTER SHELL SCALE A PROBLEM IN MAINE APPLE ORCHARDS

During the past four or five years oyster shell scale has been on the increase in a number of Maine apple orchards. At present the scale presents a real challenge in some of the infested orchards. Although the problem appears to be most severe in Maine orchards, there are several aspects of the situation that are of interest to apple growers through a much wider section of New England.

Destructive Habits of the Scales. As the name implies, infested apple twigs appear as though encrusted with minute oyster shells. At first only a few scales may be present, and as they are about the same color as the apple bark, they are easily overlooked. As the infestation increases the smaller twigs become heavily encrusted, and a few of the scales settle on the growing apples. Finally the whole tree, including the trunk and large limbs, as well as the twigs, may become heavily infested by the scales. As the infestation grows, the tree becomes weakened; small twigs begin to die, and later larger limbs are killed by the scales. In some orchards only a few scattered trees are severely infested by the scales. In other orchards, infestation is widespread.

Life History. The oyster shell scale spends the winter in the egg stage, concealed under the protection of the old scale cover. In the spring, soon after petal fall, the eggs begin to hatch, and hatching continues over a period of ten days or more. The newly-hatched scale is a minute, active, crawler with six legs. The crawler soon settles down, inserts its sucking tube into the apple bark, and begins to form its protective scale cover. After the scale insect forms its protective cover, it sheds its legs, and never moves from that spot. The scale grows in size until late summer, when it reaches full size, and eggs are soon formed. After the eggs have been deposited, the parent insect under the scale shrivels away and dies. Each scale may deposit from 50 to 100 or more eggs.

Control Problems. The present infestation of oyster shell scale is most severe in well-cared-for orchards, and especially in orchards which have been consistently dusted. It has been observed that neglected trees may be practically free from scales, while adjoining well-treated commercial orchards are severely infested. This suggests that the spray or dust in some way favors the development of the scales. Perhaps the sulphur destroys many of the natural enemies which otherwise would keep the scales under control.

The thorough application of dinitro-oil spray in the early spring, while the apple buds are still dormant, has given satisfactory control of oyster shell scale. There are some valid objections to this treatment, however. First, very thorough coverage is required, which is expensive of time, material, and labor. In Maine there is only a very short period between the passing of the snow cover and the beginning of activity of the apple buds. Moreover, it usually is very difficult to drive a sprayer through our orchards during that period.

There is need for an effective spring or summer treatment, perhaps directed at the destruction of the newly-hatched scales. Preliminary experiments have not yet developed such a treatment that fully meets the requirements of the Maine apple growers.

-- F. H. Lathrop, Entomologist
Maine Agricultural Experiment Station

## APPLE MARKET REPORTS

By this time most growers in Massachusetts will have received notice that the Apple Market Reports issued by this Department will again be available this season. Definite decision to resume the service, despite the short crop, has been made upon receipt of a request representing the unanimous vote of the Executive Committee of the Massachusetts Fruit Growers' Association.

At first thought the combination of a very light crop, together with price control, might make it appear that apple quotations would be subject to very little change this season. However, sales of early apples

already are showing that everything does not sell at the ceiling price. In addition to this, the Executive Committee of M.F.G.A. felt that the other features of the report, namely, comment on general market conditions and the cold storage information, as fully as important as the actual quotations and, therefore, they feel the reports are needed this year just as much as ever.

For the benefit of any new readers, these reports cover market prices on Boston, Worcester, and Springfield markets, with supplementary reports from other outside markets, including Providence and New York City. During the winter, holdings of apples in cold storage in New England and in the United States will be reported regularly, with a special section devoted to McIntosh cold storage supplies. The development of this cold storage report on McIntosh movement has been a very helpful feature in keeping growers informed as to the rate of withdrawal and the prospective supplies available for later markets.

Reports may be obtained upon payment of the cost of postage. The amount of postage depends upon the grower's preference as regards first or second class mailing. This matter is handled by the M.F.G.A. through the office of Secretary W. R. Cole, Amherst, Mass. Requests for the Apple Market Report should be forwarded to Secretary Cole at that address.

-- Frederick E. Cole, Commissioner
Massachusetts Department of Agriculture

## KILL THE PEACH BORERS

It is time to be treating peach trees for borers. In some orchards this is enemy number one of the peach tree. With fewer apples to pick this fall it should be easier to get this job done on time.

The paradichlorobenzene treatment is still the recommended treatment. Directions for using PDB will be found in Mass. Agr. Expt. Sta. Bul. 399 or a special sheet of instructions will be sent to any one desiring it. Since PDB is not effective after the soil temperature falls below 60° F, this treatment should be used in late August or early September.

The ethylene dichloride emulsion treatment has been used successfully at the College for five years. It has also been tried by a few freuit growers with good results. This treatment is very apt to cause injury on heavy, wet soils. On the other soils it may cause injury unless the directions for its application are carefully followed. Directions for the use of EDE will be sent upon request.

Dr. Snapp, the originator of the ethylene dichloride treatment, now has a propylene dichloride treatment which he says is safer and more effective than the ethylene dichloride. Some propylene dichloride emulsion was tried at the College last fall. No injury to trees resulted but so few borers were present, even in the untreated trees, that its relative effectiveness could not be measured. This material is still very much in the experimental stage.

-- J. S. Bailey

POW APPLE PICKING PROJECT

German Prisoners of War stationed at Fort Devens will assist about 50 growers in harvesting the apple crop in the Nashoba area this fall. At least 600 prisoners have been requested including about 100 in Hillsboro County, New Hampshire. The Army has contracts with two associations of fruit growers, which in turn have contracts with the individual growers. Here are three pieces of information which throw some light on the project: (1) A memo sent by W. H. Thies to Nashoba apple growers on August 28, (2) a section from the grower's contract, and (3) information for employers to guards on the apple picking project, released by the Camp Commander.

(1) Memo. Your attention is called to the following items in connection with the POW project: Telephone Number - Ayer 311, Extension 4296. You may contact me by telephone during the following hours: Monday through Friday - 6:30 to 10:00 a.m. and 2 to 5 p.m., or you may reach me by letter at Headquarters, POW Camp, Fort Devens. Don't hesitate to call or write about anything which will contribute to a smoothly running program.

Requests for prisoners shall be made by Thursday of the previous week. So far as possible, the same group of prisoners will be continued on a particular job. This may not be feasible, however, if a group is requested a second time after being once released and put to work elsewhere.

Cancellations for causes other than rain must be made by 3 p.m. of the previous day. For cancellations on account of rain (which must be made by 6 a.m.), call Extension 4205 (operator on duty at all times). Growers may be assessed $1.50 a day per prisoner for cancellations not in accordance with these rules.

The transportation allowance covers only the distance over which prisoners are actually transported, - not the empty truck or bus mileage to and from the Camp. Each truck or bus should be identified by a conspicuous placard showing the grower's name.

(2) Contract. The Grower shall pay for prisoner of war labor furnished him at the rate of Sixty (60) cents per hour and for piece work at the rate of Fifteen (15) cents per bushel box, whichever is more. On either basis the minimum hourly pay shall be 60¢. The Grower shall also pay in advance five (5) cents per day per prisoner employed to cover overhead expenses of the Association. Any funds received from this source in excess of actual cost will be returned pro-rata at the end of the season. The Grower shall, on the signing of this contract, pay to the Association in advance for the prisoner of war labor required for the first week of employment at the rate of $4.85 per day per prisoner. At the end of one week of employment the Grower shall make a further payment for one week in advance (on Thursday) at the same rate, and weekly thereafter as long as the employment continues. Checks should be made payable to the Nashoba Fruit Producers Association and mailed to Harry Bruns, Groton, Mass. (POW Project Treasurer). At the end of the first week of employment the Grower shall pay to the Association any amount due for the employment of prisoners during that week in excess of the advance payment. In the event that the advance payment is in excess of the actual amount due,

the difference shall be applied on the advance payment for the following week. Any difference between advance payments and actual amounts due for labor shall be settled in the same manner at the end of each week during said employment.

The Grower shall furnish all necessary tools and equipment for carrying on the work. The Grower shall not be required to furnish the noonday meal for prisoners employed by him. This meal will be furnished by the United States Government. The Grower shall furnish all transportation between the prisoner of war camp and the place of employment for prisoners of war and the guards accompanying them. An allowance for transportation shall be made on the following basis: An allowance of 50 cents per day per man, or the following amounts on a "truck mile" basis, whichever amount is smaller:

| Number of prisoners and guards | Allowance per truck mile |
|---|---|
| 1 to 9 | 5 cents |
| 10 to 19 | 10 cents |
| 20 or more | 15 cents |

(3) Treatment of POW Apple Pickers. The following information concerning the use of prisoners of war on agricultural projects is published for the guidance of all concerned.

1. The standard work day is 8 full hours of labor exclusive of noon meal period and exclusive of transportation time. The noon meal period may be as short as 30 minutes and should not exceed 1 hour.

2. (a) Nothing in War Department regulations or in the Geneva Convention requires that any rest periods be given to prisoners of war. They may, however, be used where they are necessary and helpful. (b) A committee from the Boston Market Gardeners Association and the Nashoba Fruit Growers Association has recommended that a rest period of 10 minutes in the morning and 10 minutes in the afternoon be granted to prisoners of war, as their experience shows this to be of definite value. (c) It must be understood, however, that any rest periods granted to prisoners of war are to be specifically given by the individual employer and that it is entirely within his discretion as to whether any are given and what the length of them is (provided only that they do not exceed one rest period of 10 minutes in the morning and one rest period of 10 minutes in the afternoon).

3. Prisoners of war may be required to work under the same conditions as are applicable to civilian labor. This covers, among other things, hours of work, amount of work to be performed, weather conditions, etc.

4. There is no specific time at which prisoners of war or guards are required to return to Camp other than that they should be so returned as expeditiously as possible after the completion of the day's work of 8 full hours of labor.

5. Attention is directed to the fact that fraternization with prisoners of war is forbidden. Fraternization in general forbids the taking of anything from or giving anything to prisoners of war including specifically all written or printed material of any nature, cigarettes, ice-cream, beverages, etc. It does not prohibit talking with prisoners of war in connection

with their duties, nor the furnishing of pure drinking water or other similar items which would be furnished to civilian workers.

6. Sentries are not to be used as work supervisors.

7. In case of any trouble with prisoners of war, including failure or refusal to work, unsatisfactory work, insolence, sickness, escapes, etc., telephone to the Provost Marshal, Prisoner of War Camp, Ayer 311, Extension 7116 or 7248.

## INACTIVATING APPLE SCAB

Probably never before have Massachusetts fruit growers experienced a combination of events such as have happened this year. Without a crop and an income, growers have been rather reluctant to spend money fighting scab as faithfully as in a crop year.

The eradication of the scab fungus in the trees during the growing season has been an effective method of controlling scab when the more generally accepted method of protection by the early sprays has failed. This has been the growers' method of attempting to end the disease, much as the atomic bomb has been the means of ending the Japanese war. With an epidemic of foliage scab now existent in many orchards, the writer finds that the grower should have taken advantage of this method of controlling the disease rather than to have allowed it to run its destructive course.

Heretofore we have relied upon lime sulfur to burn out scab and the directions in our apple spraying schedule call for 2 gallons of liquid or 8 pounds of dry lime sulfur in 100 gallons. The application is recommended after the Second Cover spray. At Waltham the writer has been studying the merits of other spray materials for destroying scab by a mid-season application. Some of these new fungicidal materials are as sensational in disease control as DDT is in insect control. It is not too early to predict some striking changes in our apple pest control schedule as we learn more about these new organic pesticides.

At Waltham some of our McIntosh trees were allowed to develop a very heavy infection of foliage scab, and on June 22 the following sprays were compared for killing out scab:

| | | |
|---|---|---|
| 1. | Flotation Sulfur Paste | 12 lbs. |
| 2. | Lime Sulfur (32° Baumé) | 2 gals. |
| 3. | Micronized Dry Wettable Sulfur | 6 lbs. |
| 4. | Fermate | 1½ " |
| 5. | Puritized | 6 1/3 liquid oz. |
| 6. | Isothan Q15 | ½ pt. |

A Spreader sticker, 1/4 pint, was added to each 100 gallons of spray, except to the Isothan Q15 spray which of itself has good spreading properties. Following the treatments, scabby leaves were gathered from the trees, and something like 5,000 scab spores were tested for spore germination on each day that leaves were gathered.

Isothan Q15, at 1/2 pint in 100 gallons, did not kill the scab spores, and it did not inactivate the scab lesions. When the concentration was increased to 2/3 pint in 100 gallons, the results were no better.

Micronized sulfur, representing a good grade of dry wettable sulfur, was unsatisfactory. The spores germinated abundantly 5 and 6 days after the application, and continued to do so on successive days thereafter. The results were no better with 8 pounds than with 6 pounds of Micronized sulfur in 100 gallons. The results with Flotation Sulfur Paste, 12 pounds and 16 pounds in 100 gallons, were similar and not satisfactory for burning out. Liquid lime sulfur, 2 gallons in 100 gallons, gave satisfactory results and eventually cleared the foliage of scab very well, although numerous germinating spores have persisted and new scab spots have appeared up to the writing of this news article (August 20).

In contrast to the above results, the Fermate and Puritized sprayed trees have never yielded any germinating scab spores. The clearing of the foliage of the scab fungus is more rapid with Puritized. The effect of the spray is more noticeable than with Fermate. The scab spots on the trees sprayed with Fermate appear fresh and active even long after the application, nevertheless the spores are ungerminable and dead. There is no burning of leaf tissue from the use of either, such as happens from liquid lime sulfur. The scabby foliage sprayed with Puritized offers the most pleasing appearance, considering the manner in which the leaves are cleared of the scab mold and the way in which the normal green color of the foliage under the scab is restored.

-- E. F. Guba

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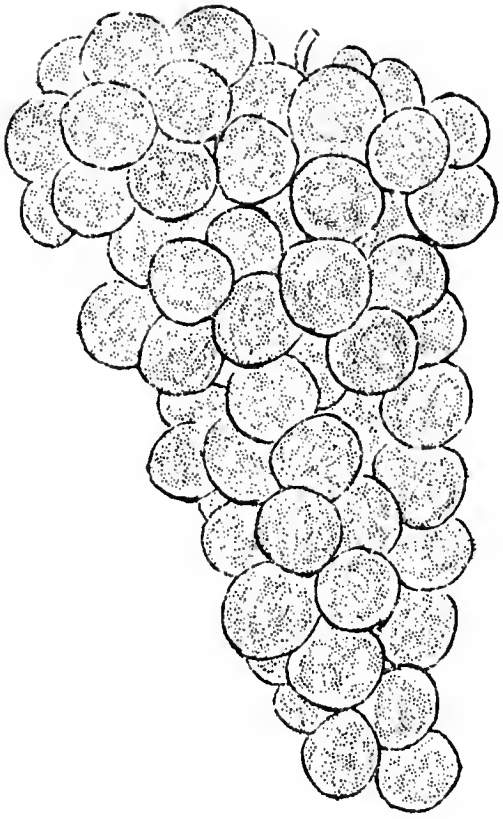
Delayed preparation and mailing of August Fruit Notes are due to the fact that the editor has been, and will continue to be for the next six weeks, actively engaged at Fort Devens in supervising the POW apple picking project. He hereby acknowledges the dozen or more interesting articles recently received from others. Several will appear in the September issue of Fruit Notes.



# FRUIT NOTES

September 28, 1945

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## THE RETURNING VETERAN IN THE FRUIT BUSINESS

What advice would an established fruit grower give to a veteran who is thinking of getting started on an orchard? Fruit growing is an attractive business. The fruit itself, the tree, the outdoors, and the type of work will have an appeal for many. Without doubt a good many fruit growers will have an opportunity to advise some veteran before many months have passed. Perhaps he will be a relative, or perhaps some young friend. The request for advice may be given in an informal or casual way, but it will be no less important to the man concerned.

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Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

I am quite sure that one of the first things you would ask him would be: What is your training and experience with fruit? Probably most fruit growers would suggest some agricultural school or college course, coupled with actual work in an orchard as a preliminary.

The grower might then turn to some of the difficulties of orcharding so that the young veteran would have a thorough understanding of the type of business he was thinking of entering. It is not easy to get a start in orcharding, he would say. In the first place, he must have a good-sized orchard - 20 acres of bearing trees at least - in order to handle it efficiently. The equipment is expensive and unless you have a good sprayer and similar tools you will never be able to grow good fruit. Thus the original investment in a good bearing orchard is sure to be large. On the other hand, it takes a long time for young trees to come into real bearing. This makes it hard to start on a small scale, for one must wait too many years before there is a profitable income.

However, the general outlook is favorable. We can look forward with considerable confidence to a period of good times when most people are working and can afford to pay good prices for apples. It may well be a period of reward for the established orchardist, but undoubtedly this same orchardist would caution the veteran that to profit by these prospective good times he must have plenty of apples to sell. If he were to reverse the process and spend the years of good times in building up an orchard, he would have to pay for it during a less profitable period, if such a time should come.

Therefore, to the veteran who may be considering coming back to his farm orchard, all of this would have its advantages. Even this veteran should give his home place as careful appraisal as though he were buying a new one. The size of the farm, soil, location, prevalence of frost, number of trees, equipment, living conditions and financial arrangements should all enter into his decision, for they all will have an effect for many years upon his income.

To come back to the m n who is starting in on a new place, without doubt the established grower would emphasize to him the need of having an immediate source of income. This might come from a large block of bearing apple trees. It might come from some other farm enterprise, or it might come from some type of work off the farm, but it must be large enough to pay the family living expenses and also the costs of developing the farm or orchard for larger future profits. If a veteran can get started on that basis, he will have a solid foundation under his business for the years ahead.

We shall, without doubt, have a large group of veterans in our next generation of fruit growers. I think we can expect too that our present fruit growers, rather than professional counselors, are the ones who will give these veterans the sound advice and the training that will get them off to a good start.

-- James W. Dayton

## DDT SHOWS PROMISE IN RECENT TESTS

Experiments by various federal agencies in several areas, notably New England and Pennsylvania, show excellent results against gypsy moth by the use of DDT from ground applications and by airplane. Some of the results reported indicate not only commercial control but actually approach very closely to extermination, at least in the experimental areas. In several of the test areas, DDT applied for gypsy moth control was found to have given excellent results against a number of other injurious insects including such pests as cankerworm, budworms, etc. Although final reports are not yet available, some of the results surpass those anticipated and lend hope to those who have heretofore felt much concern over the devastation wrought by the gypsy moth in many areas of the state this past summer.

The Japanese beetle, a species which is already present over much of the state and which this season was fully as conspicuous as in any recent years, is another pest against which DDT has given excellent results. Sprays and dusts have proved very effective against the beetles, and preliminary tests in the application of DDT to the soil indicate that the material is very effective against the grubs; much more so, pound for pound, than is the case with lead arsenate. The material also has shown a very marked residual effect against the beetles and thus enabled growers by one or, at most, two applications to secure protection throughout practically the entire season of beetle activity. Soil treatments with DDT appear to be a very promising addition to control measures and may serve as a valuable supplement to the use of the so-called milky disease or spore dust which is also giving excellent results against the Japanese beetle grubs in heavily infested areas.

The oriental fruit moth for many years showed such an excellent defense against insecticidal applications that its control by spraying or dusting was almost despaired of. At the present time the so-called oil-sulfur-talc dust has given excellent results throughout the midwestern peach areas, against this insect. Many Massachusetts growers have used this dust and reported excellent results. For those growers who are equipped to spray, a fixed nicotine such as Black Leaf 155 has also shown promising results. Both sprays and dusts are available commercially, and apparently each year more and more growers are availing themselves of these materials. Recent tests also indicate that DDT combinations (dusts or sprays) have also shown very promising results.

It is encouraging to note that the new material DDT has shown itself to be so efficient against all three of these very serious pests, and the assurance that DDT in different formations will be available commercially by another season is news that will be welcome to fruit growers.

-- A. I. Bourne

## MAGNESIUM SPRAY PRECIPITATE

(An apparent change in the spray mixture, as evidenced by an increased amount of precipitate, has been observed by a few growers, when magnesium sulfate is placed in the spray tank. The following statement by

Dr. C. A. Peters of the Department of Chemistry at M.S.C. throws some light on this problem.)

The use of magnesium sulfate in the spray material, as a source of magnesium for the orchard gives rise to new problems. If mixed with an alkaline spray, white magnesium hydroxide is precipitated in voluminous quantity. The substance, in itself, is harmless as it has a solubility of less than one-tenth of one per cent. The precipitate is colored dark by the lead sulfide if lime-sulfur and lead arsenate are present. The black substance does not cause burning. The alkaline spray materials that bring about the precipitation of magnesium hydroxide are lime or dry lime-sulfur. The dry lime-sulfur is much more alkaline than the liquid, in fact, generally, the liquid is nearly neutral.

It is a question whether there is more black precipitate when alkaline substances are present or whether it just looks more abundant spread out through the copious white precipitate. Anyway, the amount of the black precipitate is a measure of the amount of decomposition of lead arsenate and too much decomposition may give rise to harmful products.

-- C. A. Peters

## EFFECT OF MOWING GRASS ON MOISTURE CONSERVATION

To mow or not to mow the grass in an orchard, - that is the question. Will the benefits of hand mowing around the trees, for example, justify the cost? How much water, if any, is conserved when we cut a growth of grass and does the stage of maturity make much difference? These questions were put up to Dr. Wm. G. Colby a few days ago. His reply, which for lack of space was omitted from August Fruit Notes, is as follows:

"In order to inject some new ideas into the problem you recently raised pertaining to the mowing of orchards, I submitted your memorandum to Dr. V. G. Sprague at the Regional Pasture Laboratory in State College, Pennsylvania. I am submitting Dr. Sprague's reply together with a reprint of some experimental work which he has done on water utilization by Kentucky bluegrass and alfalfa. The results which Dr. Sprague obtained indicate rather definitely that more frequent cutting of grass will conserve more moisture than infrequent cutting.

"It would seem that the problem of mowing orchards is one of balancing the extra cost of frequent mowing against advantages gained in moisture conservation. The answer to this problem will undoubtedly vary from one farm to another. Where orchards can be easily and quickly mowed with tractional machinery, two mowings would be more satisfactory than one. Where mowing is difficult and expensive then I am inclined to feel personally that a single mowing would be the most desirable. If two mowings are practiced, I suspect Dr. Sprague's suggestion as to stage of plant growth is quite accurate. But where only one mowing is practiced I am inclined to think that my earlier suggestion of mowing when the vegetation was fairly well along toward maturity would be satisfactory. This would call for mowing a bluegrass stand in June and timothy, redtop, or witch grass stand in late June or the early part of July."

And here are the comments submitted by Dr. V. G. Sprague:

"Some years ago it was noted that the very heavily grazed Kentucky bluegrass pastures in southwestern Wisconsin remained green during severe summer droughts whereas adjacent, moderately grazed pastures dried up and turned brown. To investigate the reason for this, an experiment was performed in the greenhouse. Low carbohydrate (-CHO) plants were obtained by frequent clipping.

"In 1938 and 1939 here at the Laboratory a number of clones of Kentucky bluegrass were grown in gravel culture and the water used was measured. A number of clipping treatments were used. The greatest amount of water was used when the plants were clipped every 12 weeks and the least when they were clipped every 10 days--the ratio being about 8 to 1. The water transpired by a plant increases considerably as it approaches and during heading, or as the total leaf area increases.

"For orchards, as a matter of conserving the moisture in the soil as well as to provide a mulch which would allow greater infiltration, less runoff and less surface evaporation, it would seem to me advisable to cut the grass the first time about when the head was emerging and then later in the summer when the recovery growth had attained any appreciable size--say 10 inches high. It would seem advisable to leave the cut grass on the ground rather than remove it. This probably would have as great an effect in increasing infiltration as in reducing evaporation since the latter water loss is probably confined to the surface 4 or 5 inches--the greatest water loss from the soil being through the roots of growing plants. On droughty soils or in years when drought appears imminent, it might be advisable to cut before the emergence of the head and clip again when recovery was appreciable."

-- Wm. G. Colby

## SELECTING THE BLUEBERRY SITE

First of all, the location for the blueberry field should be as free from the damage of late spring frosts as possible, for while the cultivated varieties seem to resist frost better than most of the native varieties, they sometimes are injured in blossom time and even after fruit has started growing. Select a site with good air drainage, not a frost pocket.

In selecting the site there are three important characteristics of the soil to keep in mind:

1. The soil must be acid. A soil with a pH test of 4.4 to 5.1 is best although they will grow where the soil is as low in acidity as pH 7. They will stand high acidity better than too low acidity, and will do well in soils having a pH test lower than 4.4. The Experiment Station will be glad to test samples of soil at any time to determine the acidity.

2. The soil must be loose in texture, either a sandy peat or a sandy loam. A 50-50 sand and peat is perhaps ideal but providing the moisture is right, a sandy loam gives very good results. Heavy clay soils which tend to pack should be avoided, although they can be made more suitable by mixing in sand or mulch. It is very important that soil is loose enough to enable the roots to get their oxygen.

3. The correct amount of moisture appears to be the most important factor in successful blueberry growing, for while some variation in acidity and texture of soil will be tolerated, the water content must be just about right. Therefore, it is best to select a site which is as nearly right as possible and then by either drainage or irrigation to make conditions still better. Wild varieties grow in swampy places, but they have built up a mossy mound at their base so that the roots can get oxygen. In locations of this nature, where it is not possible to lower the water table, it is sometimes practical to prepare the land in such way that the plants are on ridges. In other cases, where material such as sandy loam or plain sand with a peaty bottom is available, conditions may be corrected by adding fill.

On the other hand, while some species in the wild grow on high, relatively dry ground, the cultivated blueberry will not. At least it will not produce first class fruit, except on hillside locations where water from above is constantly passing down the slope. Where dry conditions exist, it may be practical to supply water. Underneath irrigation would be preferable although overhead sprinklers have the added advantage of supplying frost protection. Heavy mulching is beneficial on too dry locations.

In general, on fairly level land, the plants should be from two to four feet above the water table and even higher on certain types of land which keep moist through the summer.

After selecting the site, one should take sufficient time to clear the land properly and prepare it for planting. It should be well worked up by plowing and cross discing or by some other satisfactory method, and when ready for planting, the plants should be set not closer than 8' x 8'. They may be set 8' x 4' but only with the idea of removing every other plant in the row after 6-10 years so that the permanent planting will be 8' x 8'.

(The foregoing discussion of blueberry soils and culture was written by a pioneer blueberry grower, John Carleton of Sandwich.)

## POW APPLE PICKING PROJECT - A PROGRESS REPORT

German Prisoners of War are harvesting a fairly large proportion of the scattered apple crop in the Nashoba area. Up to September 15 they had worked a total of 32,639 Man-Hours in Middlesex and Worcester Counties and 5,972 in Hillsboro County, N.H. Transportation is furnished by the grower for which he receives an allowance based on mileage and number of POW's transported. The total transportation allowances in the two areas mentioned above are $893 and $279 respectively, while the net balances paid by the growers are $18,690 and $3,005.

In addition to 44 fruit projects (one cranberry) thus far, at least a dozen vegetable growers are availing themselves of POW help. During the 5-day period, September 10 to 14, the following numbers of POW's were at work. Mass. (apples) - 394, 455, 408, 380, and 242 (total man-days, 1899); Mass. (vegetables) - 191, 188, 219, 230, and 215 (total man-days, 1,043); N.H. (apples) - 29, 132, 129, 132, and 103 (total man-days, 525). The min-

imum unit is 15 workers under one armed guard, although the unit is sometimes reduced to 14 on account of illness. Thus far there have been no more than half a dozen cases of illness or accident in the field requiring a trip by a staff car to transport a POW back to camp.

Many growers have expressed their satisfaction with the work done by the POW's this season. Here are quotations from two letters: "They were in every way cooperative, willing, able and intelligent, far more so than any group we had last season." "I am writing to commend the work of the prisoners of war who picked apples in my orchard Sept. 5 to 10. These men, whose names I list below, started off slowly but once acquainted with the work, they became steady, industrious, and cooperative workers. The foreman and I have felt ourselves most fortunate in having this particular crew and are sorry to have run out of apples just when these men were reaching top notch ability. Whatever their political views may be, I take my hat off to them as workers."

In one orchard where one or two units worked nine days and picked a total of 3,972 bushels of apples, the numbers of bushels picked per man per day were as follows: 21-, 24+, 26, 23-, 25, 25+, 18-, 10-, and 22+ (average, 21.5). The apple picking project will continue until about October 20.

## LOOKING AHEAD

With the end of the war and the "reconversion" to peace, conditions are changing rapidly. How will this affect the fruit grower and what should he do about it? This question was the basis for a series of discussions by professional horticulturists at New Brunswick, New Jersey, on August 27 and 28. Representatives were present from most of the northeastern states and from the United States Department of Agriculture.

As a result of the discussions, the following recommendations and suggestions regarding the future of the fruit industry were drawn up:

1. Remove orchards which are unprofitable either because of age, unfavorable soil or climatic conditions, or undesirable varieties.

2. No increase in the present total commercial production of tree fruits seems desirable under the apparent marketing conditions. New plantings should be made only to maintain present production and to secure a proper succession of plantings.

3. More thought and study should be given by many fruit growers to the possibilities of some diversification in their source of revenue aside from one kind of fruit.

4. Growers are advised to give more attention than previously to the selection of the site and soil for any new tree fruit planting and to the best land use on their own farm.

5. No varieties should be commercially planted without a searching investigation by the grower of their merits from the standpoint of both tree and fruit qualities and particularly with respect to their adaptability to the locality where they are to be planted.

6. Better varieties are needed in most districts.

7. Plant well-grown, vigorous, healthy, virus-free trees with uniformly strong, congenial rootstocks.

8. An increase in the yield per acre of a good grade of fruit is imperative.

9. Every effort should be made in cooperation with public and private agencies to reduce the complexity and cost of production and marketing.

10. The growers need to assume more responsibility for the condition of fruits as delivered to the consumer.

In future issues of Fruit Notes these recommendations will be discussed further.

-- J. S. Bailey

## APPLE STORAGE COOLED BY NEW METHOD

After months of exhaustive tests, a large apple storage in the Wenatchee district in Washington is now being cooled by what is known as the reversed air method. In this storage which holds 260 carloads and looks like a civic auditorium, a huge blast fan pumps 50,000 cubic feet of air per minute past great banks of cold pipes. The air goes through one set of ducts for three hours and then is reversed automatically when a time clock sets the machinery in motion which shifts the dampers and sends the air in the other direction. The intake ducts thus become outlets, and the air passes through the rooms in the opposite direction. This makes it possible for air at a temperature of 26° to be blown through the rooms because its direction will be reversed before the fruit near the intake ducts is frozen.

The temperature of the air rises a few degrees as it travels across the room although every three hours the direction changes and the warm side becomes the cold side. Extensive tests have shown that less than one degree difference in fruit temperatures will be experienced in any part of the storage room, - corner, center, top or bottom. This new method, therefore, means not only quicker cooling but more uniform cooling.

Believing that the whirling compressors are the most impressive part of a cold storage plant, the architect has placed them in this building where passers-by can see the wheels spin. A huge sound-proof plate glass panel separates the manager's office from the compressor room. Every conceivable modern feature has been built into the plant to keep pace with the new reversed air installation, and to improve the quality of the product during the highly competitive years ahead.

# Fruit Notes

October 29, 1945

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



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## FALL SPRAYING TO REDUCE APPLE SCAB CARRYOVER

Growers are expressing more interest than usual in the possibility of fall treatments in the orchard for the purpose of eliminating or reducing the overwintering supply of the Scab fungus. This interest is to be expected in view of the generally heavy leaf infections that occurred this season. Those most interested in the question appear to be growers who generally find it difficult to operate a heavy spray rig in the orchard at the proper time in the spring when an eradicative spray should be applied to the orchard floor.

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Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

Plant pathologists who have devoted much time to this subject have been unable to locate a spray that, when applied to the matured leaves shortly after harvest, will eradicate the Scab fungus without appreciable injury to the trees, to the fruit buds in particular. Moreover, even though such a spray mixture were discovered, its use could not be expected to be very effective for the reason that in most seasons many scabbed leaves fall to the ground before the eradicative post-harvest spray could be applied to the trees. Hence, for the present, the use of an eradicative spray to the trees following harvest seems to be out of the question.

There remains, then, the advisability of a ground spray in the late fall or early winter. It is a well proven and accepted fact that early spring applications of certain sprays to the orchard floor are very effective in destroying the Scab fungus in the overwintered leaves. Effective sprays include one-half per cent solution of sodium dinitro-ortho-cresolate (Elgetol); 100 pounds of sulfate of ammonia in 100 gallons of spray; 100 pounds of nitrate of soda plus 4 pounds of calcium arsenite in 100 gallons of spray. Are these same sprays equally effective when applied to the leaves on the ground in the fall? There appears to be no experimental evidence on this question. Pathologists who established the usefulness of the springtime eradicative sprays have indicated (through correspondence this fall) that the same sprays might be expected to prove effective, although it is pointed out that the Scab organism is not in the same stage of development in the early winter as it is at delayed-dormant time in the spring. Furthermore, it would be advisable to wait until practically all the leaves are down before such a ground spray is applied in the fall. It is felt that if such caustic sprays are applied in late fall or early winter to both the ground and the remaining leaves on the trees, injury to fruit buds would likely result.

Hence, it seems advisable for growers who ordinarily cannot get into their orchards at the silver tip to delayed dormant period and who wish to try out a fall or early winter eradicative spray for Scab control, to wait until all of the leaves are on the ground. Then wet the leaves thoroughly on the ground with one of the sprays mentioned above, preferably Elgetol one-half to one gallon in 100 gallons of spray. Thorough coverage of the floor cannot be expected with less than 550 to 600 gallons of spray per acre. For those who generally are able to operate the spray rig in the orchard in the early spring, it is preferable to wait until that time of year to apply the eradicative spray to the orchard floor.

-- O. C. Boyd

## SHRIVELLING of APPLES IN STORAGE

Studies on shrivelling of apples in storage by Dr. Smock of Cornell University indicate that the early part of the season often is a critical period. Dry boxes and wooden walls absorb a great deal of moisture and keep the air dry. The obvious solution is to keep the floors and perhaps the walls wet, especially in the Fall months. Wetting the boxes themselves would be an even more effective procedure but might not be advisable if apples are stored in market boxes.

-- R. A. Van Meter

## CONSERVING THE ORCHARD SOIL

Since good orchards are almost invariably found on sloping areas of fairly high elevation, the problem of erosion is of real concern to the fruit grower. In one such orchard, sheet erosion over a period of thirty years has raised at least two feet the layer of loamy, surface soil above a stone wall at the base of the slope. At the top of the hill one is conscious of walking on a compact, cement-like material, the subsoil of years past. But sheet erosion, or a downward shift of the surface layer is only one of the problems involved. Gullied roadways, unequal stimulation of trees through a movement of nitrates, exposure of roots to winter injury and a disrupting of new seedings are also of concern to anyone interested in orchard management.

The writer has often wished that a particular hilltop orchard which towers above an extensive marsh, might be the recipient of an "upward shift." Its response to a layer, one foot in depth, of fertile loam crammed full of organic matter, challenges the imagination. The only hitch in this visionary project is that a loamy soil, once shifted to a lower level seldom if ever moves back to its original position. Our job is to prevent this soil movement, so far as possible, and here's where the principles of soil conservation should be applied.

Are all soil types and all kinds of topography suited to contour planting? The answer is definitely "No." A hummocky area or one with abrupt, irregular slopes is not suitable because they involve either rows with drastic curves, or short rows. But if we make a study of the various soil types, we will find that those best suited to the growing of tree fruits such as the Paxton, Charlton, Colrain, and Gloucester series are generally of a slope well suited to contour planting. Anyone contemplating the setting of a new orchard should become familiar with the available soil types and plant only on those rating at least 70%. He should also seek the council of a skilled soil conservationist. This service may be arranged through the county extension office.

Keeping the soil where it is, making water penetrate where it falls, and preventing gullies are easier of accomplishment than most folks realize. They do not entail the same practices in every orchard. But in every case one must cooperate with nature. If harrowing is to be done, the driver should travel as nearly on a level as possible. Alternate strips may be more safely harrowed than the entire orchard. And it should be borne in mind that a heavy cover of vegetation, either growing or in the form of a mulch is an excellent means of encouraging the penetration of rainfall. Water, soaking into the soil where it falls, comes into contact with roots which need it, while that which flows to the foot of the slope is merely added to an already existing surplus. Soil conservation halts the loss of water, soluble mineral elements, and the finer soil particles, processes which tend to make a poor soil poorer. Post war agriculture must of necessity team up with soil conservation.

LOOKING AHEAD (continued from September issue)

As indicated in September Fruit Notes, a meeting of 15 eastern pomologists representing 9 states and the U.S.D.A., was held at the State University, New Brunswick, New Jersey, on August 27 and 28 for the purpose of discussing "Reconversion Problems in Fruit Production." On the second day, a series of recommendations and suggestions was drawn up and approved with regard to the future welfare of the fruit industry, as follows:

1. Remove orchards which are unprofitable either because of age, unfavorable soil or climatic conditions, or undesirable varieties.

2. No increase in the present total commercial production of tree fruits seems desirable under the apparent marketing conditions. New plantings should be made only to maintain present production and to secure a proper succession of plantings.

3. More thought and study should be given by many fruit growers to the possibilities of some diversification in their source of revenue aside from one kind of fruit.

4. Growers are advised to give more attention than previously to the selection of the site and soil for any new tree fruit planting and to the best land use on their own farm.

5. No varieties should be commercially planted without a searching investigation by the grower of their merits from the standpoint of both tree and fruit qualities and particularly with respect to their adaptability to the locality where they are to be planted.

6. Better varieties are needed in most districts.

7. Plant well-grown, vigorous, healthy, virus-free trees with uniformly strong, congenial rootstocks.

8. An increase in the yield per acre of a good grade of fruit is imperative.

9. Every effort should be made in cooperation with public and private agencies to reduce the complexity and cost of production and marketing.

10. The growers need to assume more responsibility for the condition of fruits as delivered to the consumer.

1. "Remove orchards ...." The Extension Service has been advocating this for years. In WPA days many unprofitable trees were cut down. However, there are still many orchards which need to be pruned with an axe. Orchards where the trees are too thick, orchards on poor soils, orchards of poor varieties, need to be given special consideration in order to reduce the cost of production.

It may legitimately be asked, when does an orchard become too old to be profitable? Unfortunately, no rule of thumb method can be given for

answering this question. Since conditions vary from orchard to orchard, each grower should consider carefully the records of his older blocks. Are they producing enough to pay for their increased cost of upkeep and yield a profit besides?

Orchards on unfavorable soils or sites should be eliminated to increase the efficiency of the enterprise. Orchards on unfertile soils, on soils too dry or too wet, in frost pockets or on sites subject to winter injury must be viewed with a critical eye. Sometimes only part of a block is on poor soil or in a poor location. This often results from the old practice of planting in more or less rectangular blocks. Too often a fence or hedgerow has determined the size and shape of an orchard. The practice of removing hedgerows and stone fences, which is becoming more common among fruit growers, is to be commended. This allows the orchard to be fitted to the soil and site instead of planting that north five acres and then hoping the trees in the poorer places can be carried along somehow. Those poor spots will probably grow better mulch than trees.

Remember the New England Seven? A bulletin illustrating them in color was published in 1928. That wasn't the first attempt to eliminate poor varieties, but it was a noteworthy one. And still there are orchards with varieties no longer profitable to raise. Fuel is scarce. It's an excellent time to use the axe.

2. "No increase ...." In view of the present overall situation, it appears that no increase in the total planting of apples and peaches for the country as a whole is justified. However, there are local situations which should justify small increases. Some growers may need to increase the size of their plantings to the point where labor saving equipment can be used economically. Twenty years ago there was talk of McIntosh being over planted. Yet the number of McIntosh trees has increased from 240,000 in 1925 to 376,000 in 1940 and McIntosh still has a ready market in all except the occasional year such as 1942 when a large McIntosh crop coincided with a large total crop. With better handling and distribution, it should be possible to sell many more McIntosh than are sold at present.

The overall outlook for peaches is one of heavy planting and probable over-production in the very near future. Peach plantings in Massachusetts are at the lowest ebb since peach growing was started. Good home-grown, tree-ripened peaches always find a ready market even when the shipped-in supply is large. Therefore, some increase in Massachusetts peach planting seems justified. Since very few pears, plums, and cherries are grown in Massachusetts, plantings of the better varieties of these fruits could be increased. They should be particularly valuable for the roadside stand trade.

3. "More thought ...." Notice that this recommendation says "thought and study....given....to the possibilities." That doesn't mean that every fruit grower should diversify. Perhaps your particular setup, your temperament, your training, your market or any one of numerous other reasons may make it inadvisable for you to diversify. "Thought and study" should reveal this.

The word "diversification" should be given the broadest possible interpretation. Thinking of diversification in terms of growing other tree fruits or small fruits is too narrow. Any source of income, aside from the main crop, whether it be running a gasoline station, renting a truck or tractor to the town for road work, keeping poultry, fattening livestock, or selling gravel, should be considered as diversification. Look around you. What other worthwhile opportunities do you have or could you develop?

4. "Growers are advised ...." The selection of a good site and good soil is highly important, especially with peaches, when one considers that the success or failure of a long time venture depends to a large extent on this decision. In making this decision old conceptions should be cast aside and the farm thought of as a unit. How can the farm be divided up, regardless of present field boundaries, to make the best use of the sites and soils available? The soil conservation service has studied intensely this matter of land use and is in a position to give much aid in working out a plan.

5. "No varieties ...." This may seem like a big order, but it must not be forgotten that the final decision concerning any variety rests with the grower, and further that this decision, like that regarding site and soil, will have a very important bearing on the future success or failure of the orchard. The State College and other agencies test varieties and eliminate some which are obviously worthless and make general recommendations in regard to the rest. For a particular set of conditions on a particular farm the grower must take all the information available and use it as it applies to his conditions.

6. "Better ...." Few would disagree with this. Massachusetts needs one or more better late winter apples. An apple of McIntosh quality and season that wouldn't bruise so easily would be a great help.

7, "Plant ...." Sometimes the temptation to cut planting costs, especially when prices for trees is high, is very great. Buying low grade trees is poor economy because they usually get off to a poor start and never catch up with high grade nursery stock. The chance of getting virus troubles in apples is very slight, because only one virus disease has been reported on apples and it is very uncommon. No virus diseases of pears have been reported. Plums are carriers of peach yellows but are not affected by the disease and show no symptoms. Peaches and cherries, on the other hand, are subject to several virus diseases. With the increasing use of clonal rootstocks and double working of trees to produce trees with more hardy frameworks, more attention will have to be paid to getting compatible combinations.

8. "An increase ...." The words good grade should be emphasized. Anything has a market this year, but don't forget that green McIntosh were a problem last year and that in 1942 only U.S. No. 1 could be sold to the government. In a big crop year, poor apples are hard to sell even for cider.

9. "Every effort ...." Fruit growing has become during the past 20 or 30 years a more and more highly specialized and complex business. Can this trend be reversed? Can, for example, the number of materials and the number of sprays used in pest control be reduced? A single material applied

once a year to control all insects and diseases would be ideal. Visionary? Yes, but so was the atomic bomb 20 years ago. Simplification is certainly coming but it will take a great deal of effort on the part of many agencies.

10. "The grower ...." The question may legitimately be raised as to just how much responsibility the grower should be expected to take. Fruit may pass through the hands of several individuals or concerns between the time it leaves the grower and the time it reaches the consumer. If the grower delivers the fruit in good condition when he makes his sale, doesn't his responsibility end? Hasn't he done his part?

In answer to these questions let us ask some others. Who should take the responsibility for all the poor and unattractive apples offered for sale in various stores? If the grocer ruins them, isn't that his hard luck? Or if the wholesaler ruins them, isn't that his hard luck? The grower has received his money for the apples. Is he concerned? Suppose the public won't buy apples but buys other fruit instead, then who suffers? No matter who ruins the apples they are still the product of the fruit growers' sweat and toil on which he is depending for a living. If the fruit grower doesn't take more responsibility for seeing that the consumer is offered good apples, who will?

-- J. S. Bailey

## POST-WAR READJUSTMENTS IN FRUIT FARMING

Like every other important branch of Massachusetts agriculture, fruit farming will face many readjustments, which, if carried out successfully, should place the local fruit industry, especially apple growing, in a sound competitive position. The problem of wartime overexpansion which may arise in connection with some other lines of agricultural production is not one to trouble the fruit industry. As a matter of fact, within recent years in the country as a whole the replacement of old orchards has been on a rather low level. Apple consumption, on the other hand, is at the point where it has already met all its competitive factors and its course promises at least stability, if not some expansion, in line with a generally higher trend in demand for fruit products.

With this generally favorable background, the Massachusetts producers will be able to maintain and even improve their position if they continue proper efforts to organize the industry according to the best methods that are now available both in production and in distribution.

From a long-time point of view it is vitally necessary to secure the location of orchards in areas with the most suitable soil and climate conditions. Considerable progress has been made within recent years in soil classification in this state to determine the land best adapted for the growing of fruit. Likewise the lessons of long experience clearly indicate the necessity of proper location of orchards in relation to air drainage and avoidance of frost pockets.

From the immediate point of view it will be important to keep the orchards in vigorous condition by removal of old trees and sufficient new plantings to provide for both replacements and possible expansion on the more favorable sites.

With the general trend toward mechanization in the whole field of agriculture, fruit farmers should also take advantage of possibilities provided by new types of machinery, such as light tractors, trucks and electric motors. This should provide for greater efficiency in the use of labor and the possibility of taking care of larger producing units with the same amount of labor. The latest developments in spraying materials and methods should be properly studied and adopted.

Much as can be accomplished on the production side of the business, the opportunities for improvement in the handling and marketing of the product are equally great. The advantageous location of the Massachusetts industry in the midst of the greatest consuming area has not been heretofore explored to the fullest possible extent. There is no reason why more Massachusetts apples should not be sold both within the State and in outside areas if more forceful action is taken in marketing the product and if proper methods are adopted by more growers for the grading, inspecting and packaging of the product. In the matter of the adoption of new methods of handling and marketing their product the Massachusetts fruit producers on the whole have been more conservative than those in other sections of the country. The natural advantages of the quality of the local product and of location in the principal consuming region should enable the fruit growers in this State to improve their competitive position considerably, if the modern methods of production and distribution are fully adopted and developed.

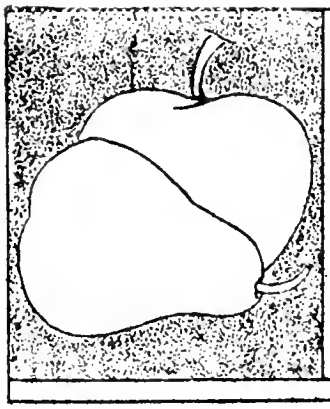
-- David Rozman

## A NOTE ON ORCHARD MANAGEMENT

The campaign to eliminate the plow from our list of farm implements is apparently passing into obscurity and our Massachusetts onion and tobacco growers continue to plow their fields. The plow has, for more than 20 years, been practically obsolete in Massachusetts apple orchards. Sod culture and mulching are the most common practices. Liberal nitrogen applications are essential in the sod orchard but we have observed that nitrogen fertilization of mulched orchards may be injurious after a few years of liberal application of mulch. The primary objective in applying phosphorus and potash in the orchard is to favor the growth of grasses and other plants needed to maintain soil organic matter. The writer believes that it will pay to use a grass fertilizer, perhaps a 7-7-7 formula on grass land outside the orchard to grow hay for mulching purposes. In our experience such a program will generally make unnecessary any direct fertilizer application to the orchard trees. There are doubtless special cases where something additional will be necessary.

-- J. K. Shaw

The strawberry planting should be mulched soon after the ground freezes. It is just as important not to mulch too early as too late. It takes several light frosts to accomplish the hardening of the plants, and fully matured plants can endure a temperature as low as 21° F. The mulch should be applied before the temperature drops below that level.



# Fruit Notes

November 26, 1945

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## WINTER SCHOOL FOR FRUIT GROWERS - January 21 to 25, 1946

This school is intended primarily for experienced fruit growers - for foremen, for skilled workmen, for the orchard owner who wishes to come abreast of recent developments. It will review the fundamentals of fruit growing, but it will emphasize particularly the things that are new. Look for further announcement in December Fruit Notes.

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Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

## SUPPLY OUTLOOK FOR FUNGICIDES AND INSECTICIDES IN 1946

Exports Increased: The Chemical Unit of the Bureau of Foreign and Domestic Commerce forecasts heavy exports of fungicides, insecticides, disinfectants and other sanitation supplies in 1946. It is expected that export shipments will increase from the pre-war value of $5,000,000 to around $11,000,000. Copper sulfate is the material in greatest demand. In 1943 the United States shipments abroad of this item alone were valued at approximately six and one-half million dollars. In the same year, exports of other pesticides were as follows: nicotine sulfate $593,000; calcium arsenate $510,000; lead arsenate $484,000; Paris green $196,000; seed disinfectants $185,000; petroleum oil sprays $131,000; rotenone-bearing materials $34,000; and chloropicrin $22,000.

Domestic Supply Ample in Most Cases: In its October issue of A.I.F. News, the Agricultural Insecticide and Fungicide Association made the following announcement regarding anticipated supplies of agricultural pesticides for 1946: rotenone, tight; nicotine, tight with supplies uncertain; borax, formaldehyde, paradichlorobenzene, organic fungicides and wettable spreaders, tight to adequate; practically all others, including pyrethrum and DDT formulations, adequate to ample.

Exceptions to the stated situation for organic fungicides are as follows: The supply of Fermate is reported (November 12) by the manufacturer to be ample for use not only on farm crops but on greenhouse crops and outside ornamentals as well. It will be available in three-pound bags and 25-pound drums. The manufacturers and distributors of Puratized state (November) that the supply of Puraturf may be adequate for disease control in turfs and lawns, but that stocks of the Puratized Agricultural Spray will be sufficient only for limited use under careful supervision. This spray has proven highly effective experimentally in the control of apple scab in Massachusetts during the past two seasons.

Need for Early Orders and Recommendations: Due to the hangover of labor and container shortages, production of fungicides and insecticides is expected to be slow and gradual with distinct interruptions at times. For this reason, the manufacturers and distributors are still requesting that users place their orders as early as possible in order that distributors may know what to expect for their total orders and stocked supplies, and in order to insure an orderly, even flow of supplies from the manufacturers to the retailers. This appears to be particularly important in the case of nicotine and other materials that are likely to be short in supply. Such materials should by all means be ordered early in the winter so that they will be on hand for emergency use during the growing season.

The Agricultural Insecticide and Fungicide Association also recommends and urges that, in view of the increased supplies of new fungicides and insecticides, Federal and State pest control recommendations for 1946 be issued to farmers just as early this fall and winter as possible. Doing so will permit farmers to estimate their needs and to place orders in ample time for normal delivery. If release of recommendations is delayed until next spring or summer, a "rush on the market" for new pesticides may be expected, resulting in all probability in marked local shortages and unequitable distribution.

Price Outlook: Although manufacturers of fungicides and insecticides have not yet announced prices for the 1946 season, it is felt by some at least that there is likely to be an increase in price for many of the standard materials over last year's figures.

Recommendations for 1946: Information on the recommended uses of the newer fungicides and insecticides in Massachusetts for 1946 will appear in this publication from time to time during the winter months, as well as in the revised printed pest control schedules.

-- O. C. Boyd and A. I. Bourne

## APPLE BLOOM IN MASSACHUSETTS: 1798-1849

(We are indebted to Prof. R. L. McMunn of the Dept. of Horticulture, University of Illinois, for calling to our attention this interesting information printed in an old Boston publication.)

The blooming period of fruits is one of the records invariably taken by workers who have charge of varietal test orchards. For the most part such records do not date back more than fifty to sixty years. Scattered references in the early proceedings of horticultural societies and early farm papers yield some information, yet it is with difficulty that the year to year performance can be gotten for a given location. Just recently I came across an article giving the blooming dates of apples for the years 1798-1849 in Massachusetts, so am presenting this data to you. The article, which appeared on June 23, 1849 on page 213 of Volume 1, Number 14, of "The New England Farmer" (published in Boston), a semi-monthly journal devoted to agriculture, horticulture, etc. is as follows:

"Mr. Editor: Thinking that you may be pleased to lay before your readers the following table, I forward it for insertion in the New England Farmer. It contains the blossoming of apple-trees in Mansfield, Massachusetts for fifty-two years, from 1798 to 1849, inclusive:

| | | |
|---|---|---|
| 1798-May 13 | 1815-May 27 | 1832-May 31 |
| 1799- " 19 | 1816- " 28 | 1833- " 12 |
| 1800- " 17 | 1817- " 23 | 1834- " 20 |
| 1801- " 17 | 1818- " 29 | 1835- " 29 |
| 1802- " 26 | 1819- " 25 | 1836- " 21 |
| 1803- " 22 | 1820- " 17 | 1837- " 30 |
| 1804- " 22 | 1821- " 27 | 1838- " 30 |
| 1805- " 14 | 1822- " 15 | 1839- " 18 |
| 1806- " 27 | 1823- " 23 | 1840- " 17 |
| 1807- " 27 | 1824- " 19 | 1841- " 26 |
| 1808- " 18 | 1825- " 15 | 1842- " 19 |
| 1809- " 25 | 1826- " 15 | 1843- " 22 |
| 1810- " 19 | 1827- " 17 | 1844- " 11 |
| 1811- " 15 | 1828- " 17 | 1845- " 21 |
| 1812-June 2 | 1829- " 21 | 1846- " 15 |
| 1813-May 25 | 1830- " 9 | 1847- " 28 |
| 1814- " 14 | 1831- " 15 | 1848- " 19 |
| | | 1849- " 29 |

"Observation - May 9, 1930, and June 2, 1812 are the two extremes. Difference, 24 days; the mean of which is May 21. The mean annual blooming for the whole fifty-two years, is exactly May 21. The mean of the first 26 years, is May 22, nearly; and of the last 26 years, is May 20. The observations were taken when the blossoms had fully expanded, generally, (except some late kinds, as the russets, etc.) and their petals had begun to fall to the ground; (that is, as many petals had fallen as what remained to expand.)

"My father, Isaac Stearns, Sen., who was a farmer of Mansfield, took the old Farmer's Almanac, published by Robert B. Thomas, from its commencement, in 1791, till his death, (my father's), in 1837, and carefully noted in the margin of the Almanacs, the time of the blossoming of apple and other trees, with other events, which are to this day preserved in the family, making four good-sized volumes. We have been careful to continue the practice, so that you may depend upon the accuracy of the memoranda.

Most respectfully yours,
Mansfield, June 4, 1849 Isaac Stearns"

The editor of the magazine, S. W. Cole, commenting on the article, said many persons have observed this is the latest season (i.e. 1849) they ever knew. By the above record it appears that several seasons have been more backward, and one was four days later.

In Illinois the almanac is consulted to determine the better time to plant, best fishing days, the phase of the moon and is a place to set down the date when the old grey mare will foal. Massachusetts has gone us one better and made, out of fifty-two almanacs, a four volume set, which we might call "Apple Blossom Time in Massachusetts."

## REMOVING TREES AND BRUSH FOR FROST PREVENTION

Most fruit growers are familiar with the term "air drainage" and its relation to the occurrence of frost in the orchard; an orchard with good air drainage is relatively free from frost while an orchard with poor or inadequate drainage is the one to get frozen out.

Frequently orchards which are located on comparatively high elevations appear to have good air drainage but are damaged by spring frosts. This is sometimes due to a thick stand of trees or brush bordering the orchard on the lower side of the slope which acts as a barrier to the natural flow of cold air and causes it to back up and accumulate in the orchard.

The removal of trees and brush bordering the orchard will often aid in lessening frost injury by allowing the cold, heavy air to settle out to lower levels, provided there is a sufficiently large area of low lying ground below the orchard.

-- W. D. Weeks

## CHEMICAL ELEMENTS REQUIRED BY PLANTS

Carbon (C) - absorbed by leaves as carbon dioxide ($CO_2$). Used in the manufacture of carbohydrates. A by- or end-product of plant and animal respiration and of plant and animal decay.

Hydrogen (H) - absorbed by roots as water ($H_2O$). Used in making food.

Oxygen (O) - absorbed by leaves, stems and roots, as oxygen and by roots, as water. Also absorbed by roots in other ions as nitrates, phosphates, etc.

Phosphorus (P) - absorbed by roots as soluble phosphate ion ($PO_4$). A constituent of some of the most important plant proteins. "Phosphorus makes seeds."

Potassium (K) - absorbed by roots as soluble potassium ion. A catalyst or regulator of vital processes. "Potassium makes sugars and starch."

Nitrogen (N) - absorbed by roots mainly as nitrate or ammonium ion. Found in proteins and protoplasm. "Nitrogen makes leaves."

Sulfur (S) - absorbed by roots as the sulphate ion ($SO_3$). A constituent of most proteins. Responsible for many characteristic odors and flavors in plants - onions, cabbage, etc.

Calcium (Ca) - absorbed by roots from soluble lime compounds. Neutralizes acids in soils and plants, and provides for proper absorption of other nutrients.

Iron (Fe) - absorbed by roots as iron ion. Necessary for the formation of chlorophyll, although not a constituent. Often tied up in alkaline soils.

Magnesium (Mg) - absorbed by roots from soluble magnesium and lime compounds. A constituent of chlorophyll, an acid neutralizer, and perhaps a carrier for phosphorus in plants.

Boron (B) - absorbed by roots from borates. A catalyst which is toxic if present in m re than minute amounts - tied up in alkaline soils.

Manganese (Mn) - absorbed by roots. A catalyst - tied up in alkaline soils.

Copper (Cu) and Zinc (Zn)- absorbed by roots. Catalysts - probably essential to growth. Toxic in more than very small amounts. (A few others may be required in very small amounts.)

Photosynthesis - the manufacture, from water and carbon dioxide, of primary carbohydrate by green plants exposed to (sun) light.

Equation: $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

carbon dioxide + water → sugar + oxygen

Respiration (breathing) in this process sugar is broken down to carbon dioxide and water.

Equation: $C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O$

sugar + oxygen → carbon dioxide + water

-- A. P. Tuttle

## PROSPECTIVE USE OF DDT AGAINST FRUIT INSECTS

DDT has shown promise for the control of such important fruit-insect pests as the codling moth, apple leafhoppers, oriental fruit moth, grape berry moth, grape leafhoppers, rose chafer, Japanese beetle, little fire ant on citrus in Florida, sucking bugs that cause distortion of peaches, and, in preliminary small-scale tests, some others. It does not appear promising in the control of the plum curculio, orchard mites, or pear psylla, and its value for the control of scale insects and aphids, or plant lice, that infest various kinds of fruits is questionable. For the control of fruit insects it has, in general, been most satisfactory when used in the form of a water-dispersible powder at the rate of 1/2 to 1 pound (more often 1 pound) per 100 gallons of spray. It can be used in combination with most of the common insecticides, such as lead arsenate, cryolite, and nicotine preparations, with fungicides such as various forms of sulfur and bordeaux mixture, and with oil. For the control of the little fire ant in citrus groves, the best results have been obtained by spraying the trunks and larger branches of trees with emulsified fuel-oil solutions containing 4 to 8 ounces of DDT and 2 to 4 quarts of fuel oil per 100 gallons of final spray mixture.

Detailed recommendations for the use of DDT to control fruit insects are not given here, as for the most part there will be little reason for such use during the remainer of the 1945 season, and more detailed and reliable recommendations can be made when the results of experimental work now under way become available.

-- A. I. Bourne

## EXPERIMENTS WITH DDT AT MAINE AGRIC. EXP. STA.

Some very interesting results have been obtained by Dr. F. H. Lathrop in the control of fruit insects. Dust containing 3% DDT, 3 applications, (average .59 pound per tree), at each application, on apples reduced the number of fruit fly egg punctures by approximately 66%. The setup was as follows: An old, neglected orchard at Monmouth, Maine, consisting of 69 trees, including 29 Wolf River, was selected for the test. The rest of the trees were McIntosh, Ben Davis, and a few other varieties intermingled. The dust plot included 43 trees. A small backyard planting of neglected and heavily infested trees adjoined the orchard on the north. The entire neighborhood was severely infested with fruit flies. (The "fruit fly" of Maine is the same as our apple maggot.)

Examinations were made of Wolf River apples from the dusted trees and from check trees at harvest time. Several hundred apples were examined to ascertain the percentage of apples stung by the flies. Detailed examinations were made of several hundred additional apples to ascertain the number of egg punctures in each apple. All of the examinations were carefully made. The detailed counts of egg punctures, especially, were painstakingly made with the aid of hand lens and binocular microscope. In the plot dusted with DDT 6.7% of the apples examined were in the "not stung" class while in the check plot .8% were in that class. The average number of stings per apple in these two plots were 8.68 and 25.92 respectively.

## NOTES FROM DDT CONFERENCE

Following are a few notes taken at ramdom from the minutes of a conference on DDT held at Horticultural Hall in Boston on October 19; DDT has no fungicidal value. It is very effective against mosquitoes. Beneficial insects killed by DDT include hymenopterous parasites, lacewing flies, lady beetles (to some extent), and honey bees. It will not control mites, Mexican bean beetle and some aphids. Among scale insects, crawlers are killed to some extent. It is very effective against both the grubs and adults of the Japanese beetle and against the corn borer. DDT applied April 29 gave protection against gypsy moth for 6 to 8 weeks. Six weeks after application larvae blown into sprayed plots were destroyed. DDT can be combined with most insecticides and fungicides. Lime probably should be left out of DDT sprays or dusts. DDT is very effective against leaf hoppers and against fall web worm. It is fairly effective against oriental fruit moth although very ineffective when used alone against curculio. There is a possibility that the Food and Drug Administration may stop the movement of apples with DDT residue.

## DO YOU KNOW

That DDT, if used indiscriminately, may interfere with pollination and may also destroy insect parasites and predators which ordinarily keep certain injurious pests under control? This new material is very deadly against certain groups of insects such as flies and moths and quite ineffective against others.

That the small, roundish holes often found side by side in horizontal rows in the bark of fruit trees are made by a woodpecker commonly known as the Yellow Bellied Sapsucker? This bird feeds to a limited extent on the inner bark, cambium and sap of fruit trees although the major portion of its food consists of insects and wild fruit. The amount of cambium consumed is not large.

That selective breeding of honeybees is now possible due to the successful development of a technique for artificial insemination? Improvement of the honeybee by breeding, however, need not be as slow as in cattle breeding because 10 or more generations of bees can be produced during the time require for one generation of cows.

That, in the larger economy of Nature, insects are beneficial? A prominent entomologist of a generation ago, after pointing out the very beneficial effects of various groups of insects said, "If the time ever comes when insects are fought to the extent recommended by some economic entomologists, there will be as a consequence a great economic disaster due to the scarcity of insects.

That the 8 important commercial apple varieties in British Columbia include three common New England varieties (McIntosh, Delicious and Wealthy)? In addition, the British Columbia list includes Rome Beauty, Newtown, Jonathan, Winesap and Stayman.

That fruit prices fluctuated widely after World War I? On Armistice Day in 1918, oranges for example, were quoted at 51.5¢ per dozen. By the middle of 1919 the price had dropped slightly to 51¢, but by the middle of 1920 it had soared to 71.8¢ per dozen, and later in 1920 it crashed to 43.7¢. It is to be hoped that history will not repeat itself.

That bees may go a mile and a half or more from well established colonies in search of nectar and pollen? In a California study, honey-bees constituted 62% of the blossom visitors in a pear orchard, and one bee visited 84 pear blossoms to obtain its load of pollen. It was estimated that on a good flight day, 822,720 bees issued from 16 colonies in one pear orchard. Strong over-wintered colonies surpassed package bees in population, flight activity and amount of pollen gathered.

That a helicopter is being used successfully in the dusting of more than 4,000 acres of vegetables on muck soils in Michigan. One big advantage is found in the fact that a helicopter may be used when the soil is too wet for an ordinary sprayer or duster. The time may not be far distant when a helicopter will hover over Mass. apple trees as a humming bird hovers over a flower.

That tablets containing vitamin C will improve the color and flavor of home canned peaches, pears and plums? In experiments conducted at the Mass. Agr. Exp. Sta. it is found that the cost is less than 2¢ per pint jar at present selling prices of tablets at drug stores. Vitamin C acts against oxidation thus preventing darkening and change of flavor in fruit at the top of the jar where it comes in contact with the air.

That 44 million cases of canned fruits and fruit juices, excluding citrus, will be available to civilians during the 1945 marketing period, compared with approximately 33 million cases in 1944, and 43 million cases in 1943? Because of reduced government needs, set-aside requirements for canned fruits and fruit juices other than citrus have been terminated.

That the carbon, nitrogen, sulfur, and other atoms which make up the living world of today are the same identical atoms which formed the living world of a million years ago? This striking comment is found in a recent book, "Microbes of Merit." According to the author, our own bodies may consist of some of the identical atoms which once were part of a dinosaur, or of one of our own ancestors. Only the pattern has changed. The same clay is cast in ever changing molds.

That alloys of magnesium and aluminum make ladders lighter and more lasting than wood? Twelve-foot ladders designed at Washington State College weigh approximately 11 pounds less than similar ladders made of wood.

That, in a fertile soil, about 90% of the roots of the strawberry plant are in the upper 6" of soil and nearly 75% are in the upper 3"? Within this limited depth of soil a strawberry plant is a heavy feeder. It is estimated that about 75% of the immediately available mineral elements are found in the plow slice, or darker colored surface layer.

That the total holdings of apples in cold storage in the U. S. on November 1 were about 60% of the holdings one year ago? In spite of this fact the State of Washington actually had more apples in storage Nov. 1 of this year than it had a year ago (10,958,000 bu. as compared with 8,910,000 bu.) The totals in the U. S. were 30,858,000 ('44) and 18,515,000 ('45).

That about 19,000 farmer owned and farmer controlled cooperative associations and mutual companies now operate in the U.S.? More than 10,000 are engaged in marketing farm products and purchasing farm supplies. An estimated 3 million farmers hold membership in these organizations.

That agriculture in the U. S., as measured by the value of its goods, grew from a 49 billion dollar industry to a 70 billion dollar industry during the four years ending January 1, 1944? During these four years the equities of all owners of farm land and of tenant farmers appear to have increased nearly 7 billion dollars.

That German Prisoners of War were an important factor in harvesting the scattered apple crop in the Nashoba area this season? The total number of man-hours amounted to 54,691, and the net bill paid by 37 growers was $31,297.10. The largest number of man-hours in any one orchard was 6,624, while in four other orchards the total was in excess of 3,000 man-hours.

That a red Bartlett pear has appeared as a bud sport on a tree in Washington? Because of its bright red color it is believed to have market possibilities. A second generation tree bore a crop of these unusual pears this season.

That nearly 90% of the available nectar produced by flowers in the U. S., goes to waste? It is estimated that there are only about 5,219,000 colonies of bees in this country.

FROST PREVENTION IN THE ORCHARD. A bulletin on frost prevention in the orchard is in the initial stages of development. To make this bulletin of more value to Massachusetts growers, we should like to have information on experiences of growers, successful or otherwise. Some points which would be of value include (1) the type of heating equipment used, (2) number of heating units used per acre, (3) number of degrees temperature was raised, (4) at what temperature were fires started, (5) did the heating pay, and (6) approximate cost per acre. Any experience which you may have had in protecting your orchard from frost will be greatly appreciated. Just drop a card to W. D. Weeks, Pomology Department, Massachusetts State College, Amherst, Mass.

Experiments with Fruit in R. I. In a recent Experiment Station report we find the following interesting conclusions: (1) Solid boxes restricting ventilation show promise as a means of reducing water loss of apples during storage. (2) Pre-storage treatments of R.I. Greening apples with high concentrations of carbon dioxide give promise of controlling storage scald.

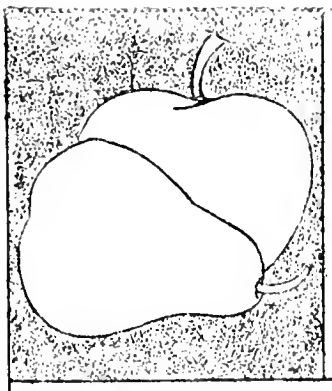
## THE PRESENT SITUATION IN THE FRUIT BUSINESS

Where soil and site are favorable there is reason to be optimistic about fruit growing in Massachusetts, although the war years have left many fruit enterprises in a "down at the heel" condition. Shortcuts and neglects have created problems which need prompt attention. The short apple crop of 1945 resulted in a greatly curtailed spray program in many orchards, with a resulting buildup of apple maggot, curculio, codling moth, and apple scab. This condition must be faced next spring if the prospective bumper crop is to be brought through in good condition. Labor has been scarce and many growers have done only enough to "get by". A few growers have done remarkably well, however, in overcoming handicaps and are entering the postwar period with very promising prospects. High prices during the past three years have brought a decided decline in apple grading. It might be said that grading no longer exists in this state since the most mediocre type of fruit is likely to sell at the ceiling price. This condition cannot continue.

While orchards have grown older, new plantings have not kept pace with orchard decline. We are not planting a quarter as many trees as are needed in commercial orchards to maintain plantings on a proper age basis. It is not a question of newcomers planting fruit trees, but rather of already established growers rejuvenating their present plantings by cutting out older blocks and planting new ones. The town of Hardwick which 35 years ago was an important apple export town is an excellent example of what happens when apple growers fail to plant trees. A shortage of good nursery stock at a reasonable price is partially responsible for the failure of growers to replant.

The spring of 1945 with its frost on April 23, teaches an important lesson as regards future plantings. Favorable sites, that is, areas relatively high with respect to the immediately surrounding country, must be selected for future plantings and varieties must be so distributed as to provide nearby pollinizers for the McIntosh variety. All over Massachusetts we have observed cases this season where McIntosh trees next to good pollinizers have borne a good crop while trees more distant from pollinizers bore only a scanty crop. Bee flight was so limited last spring as to emphasize the need for nearby pollinizers. On most fruit farms there has been a tendency to plant open fields with little or no regard to air drainage. This practice must be discontinued. Numerous orchards may be cited in which a particular block bears only now and then because of frost damage, while other blocks are bearing 500 bushels of apples per acre per year. Selection of soil and site for future plantings are of utmost importance.

During the past two or three years at least 50 commercial apple growers in Massachusetts have made a start in the removal of crowding filler trees, or in the removal of older blocks of trees. This practice should continue, since many of our apple orchards are now in the 30 to 40 year class where severe crowding is apparent. The apple business would be on a firmer basis if every commercial grower were to follow the example of a few of the more progressive growers. Removal of older trees and crowding trees as well as unwanted varieties, and planting of young trees on good soils and sites by growers now in the business, are strongly recommended.



# Fruit Notes.

December 31, 1945

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



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WINTER SCHOOL FOR FRUIT GROWERS - January 21-22-23-24.
Massachusetts State College
Amherst, Mass.

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## NEW FUNGICIDES FOR FRUIT DISEASES

During the recent war period, considerable headway was made by various manufacturing concerns in the development of new organic fungicides. Some of these have been tested repeatedly on apples and other fruit crops. A limited number of them are considered both effective and safe when incorporated into our fruit pest control schedules. Others, while effective fungicides for certain major diseases, are either not safe to the plant or they present handicaps regarding compatibility with certain other standard materials commonly used in combined spray mixtures. In other words, they are still in the developmental stage and require more experimental

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Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

work in laboratory and field before they can meet the requirements of a standard fungicide.

Fermate (Ferric dimethyl dithiocarbamate). This black, soot-like powder has been subjected to experimentation and field trials for several years, and is now recognized as a standard fungicide for several fruit diseases. It is given full recognition in the 1946 apple spray chart. Fermate may be used either as a spray or a dust. It is compatible with all other common spray materials including summer oils, except lime and copper. Although lime does not reduce its fungicidal value, it reacts chemically with Fermate to form a more soluble compound that may injure various crops. Fermate is particularly compatible with sulfur, appearing to be benefited by the sulfur as well as stepping up the fungicidal value of the latter, but it should not be mixed with copper.

Fermate, either in dust or spray form, is a decided specific for cedar rusts on apple and quince. It also acts as a safener for arsenical injury when combined with lead arsenate. Fermate is as effective as or better than wettable sulfurs for the control of scab and black rot of apple and pear, also leaf and fruit spots of pear, and it is much safer for those crops as regards fruit russet. It likewise is as effective as standard copper sprays, with much less injury to foliage and fruits, on apples for control of blotch, New Hampshire fruit spot, and bitter rot. Fermate is as effective as Bordeaux mixture or copper dusts for black rot of grapes; the equal of sulfur, and with less injury, for cherry brown rot and leaf spot. It is considerably superior to Bordeaux and other copper sprays for the control of cranberry fruit rots. While Fermate is effective against peach scab and brown rot of stone fruits, it is not considered safe for tender peach foliage.

In 1946, Fermate will be available in three-pound packages as well as in 20-pound drums. The spray deposit is improved at least on some crops by the addition of a moderate amount of spreader. Fermate should be made into a slurry or water suspension before it is added to the tank, preferably by pouring the mixture, with the spreader, repeatedly from one large pail or can into another. At the prevailing price of 60 to 70 cents per pound, Fermate may perhaps be employed most economically for control of cedar rusts and as the standard fungicide on russet-susceptible varieties such as Baldwin, Delicious, etc.

Puratized N5-E (Phenyl mercuri triethanol ammonium lactate). This complex organic compound occurs in true solution, and has been used extensively by the U.S. armed forces for mildew-proofing various kinds of cloth and other fabrics. It is considered compatible with arsenicals, nicotine sulfate, fish oil or linseed oil, but not with lime. There is some question whether it is compatible with summer oils, also with hard water, and with sulfur and when following sulfur sprays. It is considered at least as effective as the best wettable sulfurs in preventing apple scab and black rot; also the equal of lime-sulfur in burning out apple scab leaf spots without causing any injury whatever to the foliage or fruit.

The principal handicap for Puratized is the extremely small amount of mercury it contains. As long as there exists no set tolerance for this

highly poisonous metal on fruits and vegetables, the material must be used in such a manner as to preclude any mercury residue on the harvested crops. Analyses made of apples sprayed by Puratized in 1944 and 1945 indicate a detectible residue of mercury when the spray was used throughout the season, but none when the spray was discontinued after the first cover spray. If Puratized is used on fruit crops, it should not be included in the schedule later than the calyx or first cover spray.

The supply of Puratized is still limited, and the manufacturers indicate that it will be plentiful in 1946 only for limited use under careful supervision. It will be sold as Puratized Agricultural Spray, and the stock solution when diluted in the spray tank at the rate of one pint to 100 gallons will give a concentration of the active ingredient of 1:15,000.

Isothan Q-15 (Lauryl isoquinolinium bromide). This is one of the recently developed quartenary ammonium derivatives that has given considerable promise in the control of apple scab and the leaf and fruit spots of pears. It, like Puratized, is water-soluble; it possesses a high degree of inherent wetting and spreading qualities, and it is not supposed to be poisonous to higher animals. In the spray test at the College this year, Q-15 fell down badly in apple scab control, and when combined with lead arsenate the spray mixture caused considerable fruit russet and pronounced late season leaf burn characteristic of arsenical injury. Isothan Q-4 is a close relative of Q-15, is a stronger fungicide generally, but it also causes too much injury to be considered practical.

Phygon or #604 (2,3-dichloro-1,4-naphthoquinone). This promising new fungicide has been tested rather extensively on a number of crops, including a dry or dust treatment for vegetable seeds, and has proven generally highly fungicidal. However, its chief handicap is a tendency to burn the plant when applied in sufficient concentration to give satisfactory disease control. Dithane and Methosan are two other new organic fungicides likewise still in the experimental stage of development as regards their use on fruit crops.

-- O. C. Boyd

## MEADOW MICE CONTROL

Surveys of representative orchards in the Nashoba area of Massachusetts during the latter part of November indicate moderate infestations of meadow mice this year. Only one instance of early damage was observed, but signs of mouse activity were abundant in several localities.

Field observations show that most orchardists have secured adequate control through use of poisons, but there was evidence that some growers have not seriously considered the following factors:

1. Infestations are spotted or localized and not general throughout orchards. Some growers have unnecessarily magnified the task of control operations by placing the poison at every tree. Baits must be placed along active trails to be effective. Such trails are most numerous in relatively small areas which are low, rough, wet, and covered by thick grass or mulch. Check such locations carefully and don't worry too much about the rest of the orchard.

2. Meadow mice runways may also be used by shrews, which are insectivors, and the smallest and most abundant of our mammals. Deer mice too may use these trails, but they are primarily seed eaters, and like the shrew, do not constitute a menace to fruit trees. In order to verify results of poison operations, the runways should be examined for signs of fresh grass cuttings -- a sure indicator that meadow mice are still present.

3. Apple cubes, lightly sprinkled with the rodenticide, are the best baits for use in the fall. With the advent of freezing weather, zinc phosphide treated steam crushed oats is preferable. While some orchardists are still partial to strychnine grain, there is no evidence to indicate it is as effective as the zinc phosphide. The bitter taste of strychnine, and the ability of mice to build up a resistance to it, are two reasons why this poison is no longer recommended.

4. Foxes, skunks, hawks, owls, wire guards and cleared tree bases are all helpful in controlling mice, but should be augmented by fall poison operations and frequent winter checks to provide maximum protection.

Massachusetts fruit growers are reminded that assistance with rodent problems and poisons for control are available through the United States Fish & Wildlife Service at the Massachusetts State College.

-- Walter W. Dykstra

## CONTROL OF ORCHARD INSECTS WITH DDT

Following is a brief report covering experimental work with DDT submitted by Philip Garman of the Connecticut Agricultural Experiment Station

1. DDT is more effective against the Oriental fruit moth than any chemical which we have tested in the field so far. Reports from others indicate that it is equally effective against codling moth.

2. DDT is better for Japanese beetles on peaches than lead arsenate.

3. Combined with Fermate, DDT gave the best control of quince insects and diseases that we have ever been able to obtain at Mount Carmel. It controlled the quince curculio as well as the codling moth and Oriental fruit moth.

4. DDT is only partially effective against the plum curculio.

5. DDT is only partially effective against the apple maggot.

6. DDT is useless against the periodical cicada or seventeen-year locust.

7. DDT is useless alone against the European red mite. U. S. Rubber "72 E" gave promising results for mite control and may prove of value in overcoming this DDT deficiency. Destruction of lady beetle predators by DDT-kerosene applications was noted at Meriden.

8. DDT dust is ineffective against the adult pear psylla. Nicotine dust is much more effective.

9. DDT is safe on peaches where standard lead arsenate is not.

10. DDT, in general, does not cause as much foliage injury to apples as unsafened standard arsenate of lead.

11. DDT is no more destructive to honeybees than arsenate of lead, probably less. From the evidence at hand, it is not nearly as toxic as originally feared.

12. DDT will be useful, certainly on quinces, probably on peaches, possibly on apples and to a very limited extent, if at all, on pears. The main factors operating against full-scale use on apples lie in the partial curculio control and the negative red mite control, as well as the doubtful maggot control.

Control of Oriental Fruit Moth in Elberta Peaches
(Mount Carmel - 1945)

| Treatment | % Fruit Moth | Number of trees |
|---|---|---|
| (1) Sulfur-oil dust (No DDT) | 13.56 | 8 |
| (2) Sulfur-oil-DDT dust (3% DDT) | 7.20 | 9 |
| (3) Sulfur + 5% DDT fused dust (No oil) | 3.44 | 12 |
| (4) Sulfur + 5% DDT mixed dust (No oil) | 1.48 | 7 |
| (5) Check - no dust for fruit moth | 10.95 | 11 |

Dates of dust applications: July 11-12, August 9. Plot No. 1 received a third dusting on August 30. Remaining plots were not treated on that date.

## COST OF OPERATING A BULLDOZER

The following figures were taken from the records of a farmer who owned and operated a bulldozer which was used 1200 hours in 1943 and 800 hours in 1944, or a total of 2000 hours.

The bulldozer was purchased in June, 1943 at a cost of $6700. Its estimated life is 10 years or about 10,000 hours, and is given a thorough overhauling annually.

Total cost of operation over a two year period:

| | |
|---|---|
| Fuel, 5000 gallons, Diesel | $ 460 |
| Oil and Grease | 300 |
| Repairs and Parts | 120 |
| Labor for overhauling | 180 |
| Depreciation - 2 years 1/5 of $6700 | 1340 |
| Interest on investment @ 5% (2 years) | |
| First year - 5% of $6700 = $335 | |
| Second year - 5% of $6030 = $301 | 636 |
| Wages of operator @ $45 per week | 1935 |
| Total cost for two years | $4971 |

The total cost of operation ($4971) divided by the number of hours (2000) reveals a cost amounting to approximately $2.50 per hour.

- R. H. Barrett

## AIR PURIFICATION FOR LENGTHENING THE STORAGE LIFE OF APPLES

Following is a progress report on this interesting subject, prepared by R. M. Smock and F. W. Southwick of Cornell University.

### Purposes of Air Purification

1. To remove foul odors in the storage room which may contaminate the apples and hence reduce their eating quality.
2. To remove the ethylene generated by ripening apples. Study has shown that as few as one percent of the apples in a storage chamber if ripe will tend to ripen up the rest of the apples in the room.
3. To remove scald gases. Scald is caused by accumulations of certain gases generated by the fruits.

### Methods of Air Purification Used Heretofore in Apple Storage

1. Some attempts have been made to reduce the odor level by the use of ozone. Ozone is of benefit primarily in reducing the growth of surface molds on the fruits or containers. Ozone has been found to merely mask and not destroy many odors in an apple storage.
2. There have been no commercially feasible methods heretofore of removing naturally generated ethylene.
3. Scald gases have heretofore been removed by wrapping the apples in paper impregnated with mineral oil or placing shreds of such paper in the package. There are enough objections to the use of oiled paper to justify a search for a better and more convenient method of scald control.

### Principles Involved in Air Purification

Many gases can be "adsorbed" on the surfaces of specially prepared activated carbon similar to that used in a soldier's gas mask. The Cornell trials have made use of this fact. The storage atmosphere is passed through a bed of activated carbon and then the "purified" atmosphere is circulated to all parts of the room. Ethylene seems to be removed from the atmosphere more completely if the activated carbon is impregnated with a strong oxidizing agent like bromine. The use of bromine has resulted in considerable corrosion of the canisters containing the activated carbon, however. Until a substitute for bromine can be found, impregnation with special materials will not be done in most commercial tests for 1945-46. The use of unbrominated carbon has given very promising results. It is felt that better results will be had when something as powerful as bromine can be successfully impregnated in the activated carbon.

### Results of 1944-45 Tests

During the 1944-45 storage season ten tests were conducted on a commercial scale in cold storages around New York State. Only one of these storages had an acute odor contamination problem, but in this one storage the odor problem was solved by use of air purification. A careful study of differences in softening (ripening rate) was possible in only six of these ten tests. In these six tests the ripening rate of apples was significantly retarded (as compared with apples in control room) in four cases.

Lack of success in the other two tests seemed to be due to lack of good air circulation. Differences in scald due to air purification was studied in all ten tests. In five of these tests the results were very striking, that is, air purification gave as good or better control of scald than oiled paper. In two of the tests the results could only be called "promising." That is, there was a significant reduction in scald but not a satisfactory control. The remaining three tests were classed as "failures." These failures seemed to be due in large part to inadequate circulation of the purified air.

Four tests were made on a commercial scale in controlled atmosphere storage. Three of the four tests gave very satisfactory control of scald whereas in the fourth the results could only be classed as "promising." The reason for lack of complete success in the fourth case is not clear at this time. One of the striking results of air purification in this type of storage was that the apples could be sold immediately after opening the room. Heretofore the apples had to be aired out for a few days in fresh air to rid them of the accumulated foul odors of the gas tight rooms. In this type of storage it can be said that eating quality is actually improved by air purification.

## Points Needing Further Study

1. Is impregnation of the activated carbon with something like bromine absolutely necessary?
2. Is there a more satisfactory impregnating material than bromine?
3. Is the present standard of 4 canisters of activated carbon per 1000 bushels sufficient?
4. What is the optimum rate of air flow per canister?
5. Are auxiliary fans necessary for the activated carbon unit when the cold diffuser blower is "over-capacity?"

Conclusions:

Results on air purification to lengthen the storage life of the apple have been good enough to warrant further testing on a large scale. Good air circulation is absolutely necessary for good results. We are not yet ready to recommend the process with any real guarantee of success, but feel that commercial trials are well worthwhile.

## 1945 FRUIT CROP (from Farm Economic Facts)

### Apples

On a National basis, the commercial apple crop estimated at 66,754,000 bushels is the smallest ever recorded and a little more than half as large as the 1944 yield. Likewise cold-storage holdings on October 1, 1945, were only 3.8 million bushels or less than one half the quantity in cold storage a year earlier.

In Massachusetts a much similar condition exists with extremely light receipts and a strong demand even at the new ceiling price which is a step-up of 20 cents per box. Due to the shortness of crop and good demand, practically all apples are packed orchard-run this year and would not measure up to

any standard grade specification. In spite of this fact, practically all, if not all apples are bringing not less than $3.00 a bushel.

For this calendar year, it is quite evident that the civilian supply will run short of demand and prices remain around ceiling. Already the Government has required handlers in certain areas who handle over 500 or more bushels of given varieties to set aside an equivalent of 25 percent of the total quantity of "C" or higher grades. With these existing situations, the available supply per capita will be 18 percent less than last year or about 22 pounds per person.

## Peaches and Cherries

Contrasted to the apple crop for the United States, peaches, pears, and sweet cherries were comparatively high. The combined production of the principal deciduous fruits is 13 percent below last year but only 2 percent below average. In New England the peach crop is estimated at 140,000 bushels, 36 percent less than the 1944 crop and 23 percent below the 10-year average. In response to the high consumer demand, prices for deciduous fruits for the past year have been up to wartime levels. It is quite likely that they will continue as such in response to the consumer demand.

## Cranberries

The cranberry crop this year for Massachusetts is estimated at 470,000 barrels. Though this is not final, indications show that the crop will at least reach this estimate which is 317,000 barrels more than the light crop of last year.

With respect to the industry as a whole, the estimated production is 634,100 barrels or 72 percent over last year's production. Most of this increase, however, is in Massachusetts. As a result of this shortage, berries are selling at ceiling prices.

General conditions of the vines this fall are good, indicating that with favorable weather conditions prevailing during the winter and spring, a normal crop size for 1946 can be expected which would be approximately 423,000 barrels, the 10-year average for Massachusetts. Estimates beyond the average are hardly predictable due to the scarcity of labor. Very little bog work is being done, although growers are doing as much bog maintenance as possible to keep properties in good productive condition.

-- J. C. York

## 1946 APPLE AND PEACH SPRAY CHARTS

Since there will be some delay in printing the new spray charts the following new or revised Notes which will appear in the 1946 charts are here presented:

(Apple) Note 3. Apple scab infections may be prevented by either a wettable sulfur or Parmate if thoroughly applied ahead of or during rainy periods. Lime-sulfur (liquid 2 gallons or dry 8 pounds) usually prevents infection when applied within 60 to 70 hours after the

rain begins, but it may also cause serious damage to foliage and fruit. (See Note 17).

Note 4. In the combined spray of wettable sulfur and lead arsenate, the addition of twice as much lime as lead arsenate tends to reduce arsenical leaf injury and fruit russet. Use a freshly hydrated, 300-mesh, high calcium (70% calcium oxide) lime. Lime is not needed in spray mixtures containing Fermate or Puratized, and should not be added to them. (See Notes 5, 17).

Note 5. Fermate $1\frac{1}{2}$ - 100, or $\frac{1}{2}$ - 100 plus one-half dosage wettable sulfur, is far more effective than sulfur alone against cedar-apple and quince rusts, and is equally or more effective for apple scab and black rot. On Baldwin, Delicious and other russet-susceptible varieties, use Fermate $1\frac{1}{2}$ - 100 through Second Cover, followed by 1 - 100 in later sprays. Omit lime in all Fermate sprays. Fermate $1\frac{1}{2}$ - 100 in Second and later Cover sprays affords much better protection against Brooks' spot and bitter rot than sulfur sprays.

Note 6. Whenever the blossom period promises to be rainy and prolonged, a spray or dust of sulfur or Fermate will be needed around mid-bloom on scab-susceptible varieties, while either Fermate or a mixture of Fermate and sulfur (See Note 5) should be applied at that time on rust-susceptible varieties.

Note 13. (Add following to old Note 13): Puratized spray is equally effective against scab and does not injure foliage or fruit. (See Note 17.)

Note 15. (DDT) Wettable powder at rate of 1 pound DDT in 100 gallons (2 pounds 50% powder; $2\frac{1}{2}$ pounds 40% powder; or 5 pounds 20% powder) has controlled codling moth. Because of residue tolerance (7 p.p.m.) only 2 or 3 applications are advised. Applications at 2nd Cover and in Emergency Spray A are suggested. If codling moth is abundant, a third application at 4th Cover period may be made on varieties later than McIntosh. Do not use DDT with lime. If red mite increases after DDT sprays, use Emergency Spray B. Information on control of codling moth with DDT dust is incomplete. (This Note will be mentioned in the 2nd Cover, 4th Cover, and Emergency Sprays A and B.)

Note 16. A spray of Elgetol $\frac{1}{2}$ to 1 gallon - 100, or sulfate of ammonia 100 pounds - 100, or nitrate of soda 100 pounds - 100 plus calcium arsenite 4 pounds - 100, applied to the orchard floor between green-tip and pre-pink at not less than 500 gallons per acre, so as to insure wetting of all exposed leaves, will greatly reduce scab ascospore formation in the overwintered leaves. These sprays will injure new, green leaves.

Note 17. Puratized spray is more effective than wettable sulfurs for preventing scab infections, and is as effective as lime-sulfur in burning out scab spots without injuring leaves and fruit. However, it is not plentiful this year. To avoid mercury residue, it should not be used in successive applications later than the First Cover spray, nor later than June for the Emergency Spray A to burn out scab. Do not add lime to Puratized spray.

(Peach) Note 4. (To replace Special Note) Basic lead arsenate is suggested on peaches because it contains less soluble arsenic and is safer on the tree. It is also less toxic to the curculio and should not be expected to control a severe infestation. Sulfur has some repellent action against the curculio, and where this insect is not serious, sulfur alone, either as a spray or dust, may be used.

Oriental Fruit Moth. (To replace statement in 1945 chart.) Spray with fixed nicotine* or dust with sulfur-oil talc*. Apply four times at 5-day intervals beginning 3 weeks before harvest. Experimental spraying or dusting with DDT has been promising. Use DDT dust 3%, or wettable powder, 1 lb. DDT in 100 gallons (2 lbs. 50% powder; $2\frac{1}{2}$ lbs. 40% powder, 5 lbs. 20% powder in 100 gallons). Because of residue tolerance, only 3 applications at 10-day intervals, beginning middle of July, are advised. *As recommended by manufacturer.
(This Note will be mentioned in the Shuck and First Cover Sprays.)

## THE "GREEN MCINTOSH" PROBLEM

Evidence is being assembled that the problem of inferior color of apples is in many cases closely associated with a crowded condition in the orchard. In the December News Letter of the Illinois State Horticultural Society, W. A. Ruth refers to an orchard experiment in which a careful study of the effect of crowding fillers had been made. Half of the trees in this orchard were Grimes and half were Delicious, planted 20 x 20 feet apart in 1922. In 1934, one-half of the trees in parts of the orchard were removed. At the end of the 17th growing season the trees in the middle of the 40 foot square were removed. In the unthinned parts of the orchard the filler trees were cut back severely each year to reduce crowding. All other trees were pruned lightly but uniformly. Quoting from Dr. Ruth's statement:

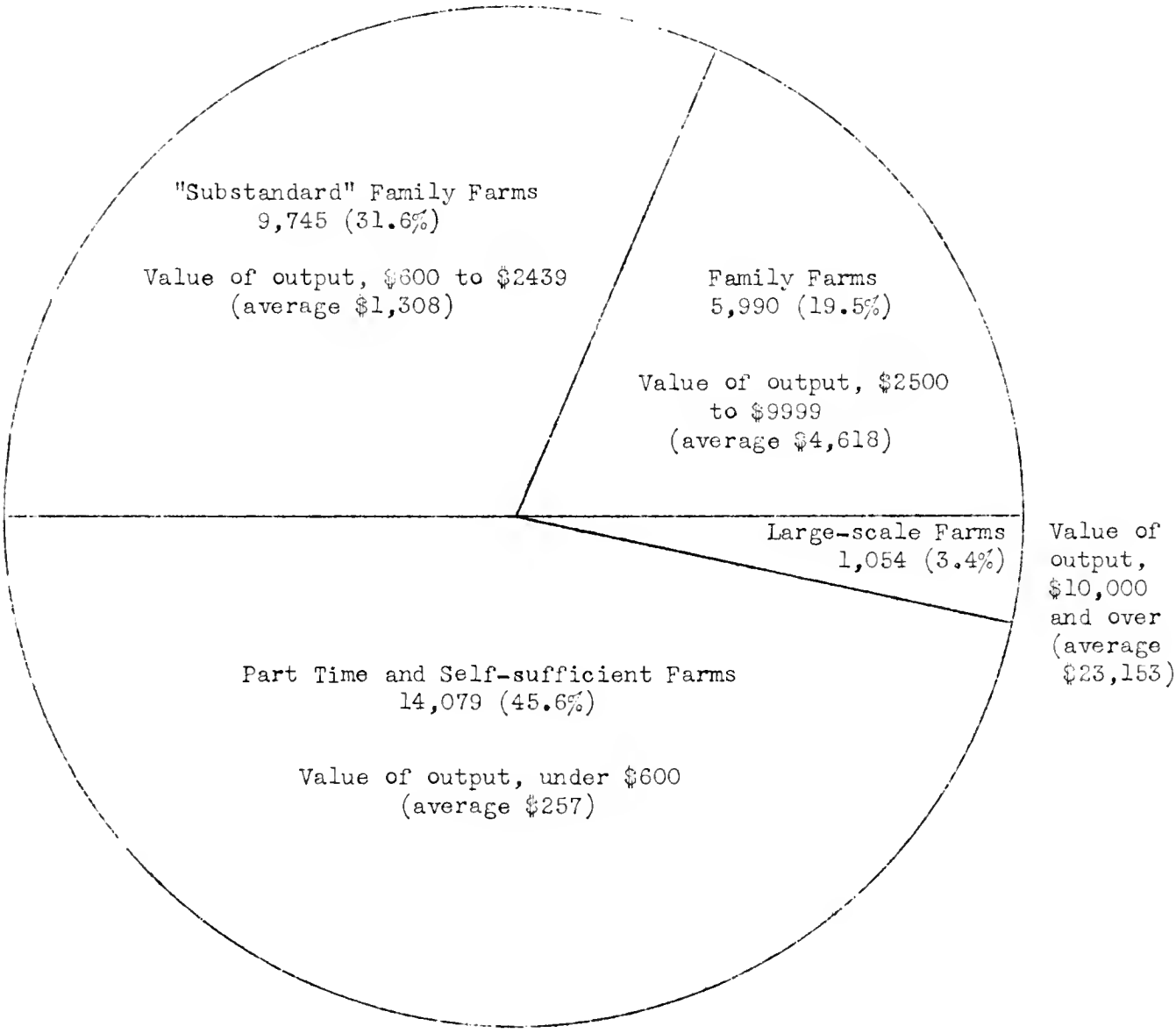
"In the thinned areas, the trees were spreading and well-formed; the un-thinned trees were more upright, with weak wood and poor foliage, especially on the lower branches. In 1939 shade had become so dense in the unthinned blocks that Delicious was practically worthless due to poor color. Grimes fruit from similar blocks developed a poor finish. Because the trees had become so crowded spraying was difficult and scab became a serious problem; leaf-hoppers were abundant where the trees had not been thinned.....

"Although the total yield between 1935 and 1939 was in favor of the unthinned areas, individual tree yields on lightly pruned trees were higher in the thinned areas. The presence of the extra trees, therefore, was already exerting an unfavorable effect upon individual tree-yield: this difference was less where nitrogen was used than where it was not used. During this period, also, the favorable effect of the 1935 thinning was reflected in better tree growth, as indicated by greater trunk circumference.

"It is concluded that the filler trees should have been removed two years earlier, when the trees were 10 years old; if this had been done, the unfavorable effect upon the permanent trees would have been less severe. In the writer's experience, however, trees which receive a setback in their earlier years, by unfavorable treatment, never catch up."

MASSACHUSETTS FARMS CLASSIFIED ON THE BASIS OF TYPE AND VALUE OF OUTPUT

The total number of farms in Massachusetts, reported by the Census of 1940, is 31,897. The following classification, prepared by David Rozman, is based on 30,868 farms.

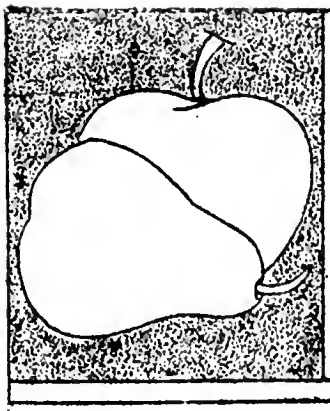



From the above diagram it will be noted that almost one-third (31.6%) of the farms in Massachusetts are classified as "Substandard" Family Farms with an average output of only $1,308, while almost one-fifth (19.5%) are Family Farms with an average output of $4,618. As the "Substandard" Farms are shifted into the latter class through the adoption of more efficient methods, clearing of new land, diversification, combining of farms, etc., the standard of living of a large number of our rural people will be improved.

1945 INDEX



(First number indicates month; second number, page.)



# Fruit Notes

January 31, 1946

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



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## CONDITIONS WHICH AFFECT SPRAY COVERAGE

In the control of fruit pests by spraying, adequate coverage is fully as important as timing and the use of the proper materials. Adequate coverage means application of the spray in such a way that all parts of the tree--especially the top and tips of the branches--are thoroughly wet. Various methods employed in applying sprays are described and illustrated in Mass. Ext. Leaflet 178, "Spraying and Dusting Fruit Trees." Because of the nature of some of the pests to be controlled, such as plum curculio, the speed with which the orchard can be covered is of special importance. Any orchard that cannot be covered in three days of good spraying weather is certainly inadequately equipped. Lack of proper equipment may be due to a sprayer that is

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too small for the job or to failure to make the most efficient use of it. Factors which affect the size and efficiency of a sprayer are suggested in the following table:

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Number of trees | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| Age of trees | 25 | 25 | 25 | 25 | 25 |
| Height of trees (ft.) | 25 | 25 | 25 | 25 | 25 |
| Spread of trees (ft.) | 30 | 30 | 30 | 30 | 30 |
| Gallons per tree | 15 | 15 | 15 | 15 | 15 |
| Total gallons | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 |
| Hours per day | 10 | 10 | 10 | 10 | 8 |
| Output per minute | 15 | 20 | 20 | 20 | 20 |
| Size of pump (gals. per min.) | 25 | 30 | 30 | 30 | 30 |
| Tank size (gals.) | 300 | 300 | 400 | 400 | 400 |
| Min. to unload | 25 | 20 | 25 | 25 | 25 |
| Min. to reload | 20 | 20 | 25 | 10 | 10 |
| Total time per load(min.) | 45 | 40 | 50 | 35 | 35 |
| Number loads per day | 13 | 15 | 12 | 17 | 14 |
| Total gals. per day | 3,900 | 4,500 | 4,800 | 6,800 | 5,600 |
| Days to cover orchard | 3.8 | 3.3 | 3.1 | 2.2 | 2.6 |

In this table it is necessary to make certain assumptions. Let us assume that the orchard contains 1,000 mature trees which on the average will require 15 gals. each to obtain adequate coverage. (The number of gallons of spray required for trees of various ages and sizes is indicated in a table which is published as a part of the "Spray Chart for Apples" as well as in Mass. Ext. Leaflet 178.) Thus, a total of 15,000 gallons of spray will be required to cover the orchard.

In Column 1 it is assumed that the discharge from the nozzles is 15 gals. per min. Thus, a 300 gal. tank could be emptied in 20 minutes. Allowing for interruptions, it is assumed that it would take 25 minutes to unload. With such a piece of equipment operating 10 hours per day it would require 3.8 days to cover the orchard. Obviously this equipment is too small for the job. In Column 2 let us assume that the output, by the addition of more nozzles, can be increased to 20 gals. per min. The time required to cover the orchard will be reduced to 3.3 days, but still the equipment is too small.

In Column 3 let us assume that the tank is increased from 300 to 400 gals. This will help somewhat but not enough. In Column 4 let us assume that it requires only 10 minutes to reload instead of 25 minutes. Then, with the same equipment as before, the orchard can be covered in 2.2 days. Even working 8 hours per day as indicated in Column 5, the orchard can be covered in less than 3 days provided it takes only 10 minutes to reload.

It is fully recognized that in this table many assumptions have been made and no allowance has been provided for delays due to weather and other causes. The two blank columns have been provided for the use of anyone who wishes to do so to fill in the actual conditions which exist in his own orchard or orchards and thus determine to what extent his present equipment is adequate to do the job.

The chief object of this discussion has been to indicate the numerous factors that are involved in determining the size of sprayer that is needed for a particular orchard and that a sprayer which may not be adequate under existing conditions may be fully adequate if the output per minute can be increased and the time of reloading reduced.

-- O. C. Roberts

## BUYING CULTIVATED BLUEBERRY PLANTS

Anyone starting to grow cultivated blueberies wants to get good, healthy, vigorous plants of the right varieties. The prospective purchaser wants to know what varieties are best for Massachusetts, what age or size of plants to order, how they should be handled, and where to purchase. (For information on varieties see Fruit Notes for March 8, 1945.)

Plants used to be sold by age classes, that is, one, two, or three-year-olds, and so on. In the terms of the nursery trade a one-year-old is a rooted cutting. These are usually not large enough nor vigorous enough to be set directly in the field but need to be grown in the nursery a year. A two-year-old has been grown in the nursery a year and, if well grown and properly handled, will withstand the shock of transplanting very well. Three-year-olds are larger and better but the price is correspondingly higher.

Recently there has been a marked tendency for nurseries to sell by height rather than age. Where this is done the 12" to 15" grade would probably be satisfactory for varieties of lower, more spreading habit, like Cabot and Pioneer, but 15" to 18" or 18" to 24" would be better for the tall varieties like Rubel and Jersey. The more vigorous the plants, the better they will start and the sooner a crop will be produced. Weak plants at a low price are usually more expensive in the end.

Some nurserymen ship plants with bare roots; others ship them balled and burlaped or "B & B" as it is expressed in the nursery trade. "B & B" means that a ball of soil is retained around the roots and held in place by a piece of burlap. This is a more expensive way of handling plants and, therefore, the purchaser should expect to pay a higher price for plants handled in this way. Two-year-olds and perhaps three-year-olds can be handled successfully either way, although "B & B" is preferable. Plants over three years old should always be balled and burlaped. If plants are handled with bare roots care must be taken to see that they do not dry out.

It is more desirable to purchase plants from a nursery which propagates its own plants than from one which buys plants for resale. There are several nurseries in Massachusetts, Michigan, New Jersey and New York which produce cultivated blueberry plants for sale.

Since blueberry stunt, a serious virus disease, is prevalent in New Jersey and North Carolina, anyone buying plants from nurseries in those states should insist on plants certified to be free from stunt. This disease is present in Massachusetts to a limited extent and probably has been for a number of years with little or no signs of spreading. Nurseries in

Massachusetts, Michigan and New York are practically free from it. Since bushes infected with stunt neither grow nor produce well, the purchaser should protect his own interests by insisting on healthy plants.

The demand for plants, both among commercial growers and home gardeners, has been very heavy the past few years, so heavy, in fact, that propagators have had difficulty in keeping up with it. Because of the short supply, anyone wishing to set blueberries next spring should get his order in early.

-- J. S. Bailey

## ANSWERS TO QUESTIONS ON DISEASES AND FUNGICIDES IN M.F.G.A. "BLUE LIST"

Q: Did wettable sulfurs control scab in 1945? A: In some cases it did--mostly (1) where there was a very light carryover of the scab organism in the orchard; (2) where the usual or a larger number of sprays (and supplementary dust applications) were applied; and (3) where spraying was thorough and timely.

Q: How can I clean up a scabby orchard? A: Any one of the following procedures should enable a grower to control apple scab satisfactorily in an orchard with a heavy carry over of scab -- even if the season is wet: (a) Spray the entire orchard floor and adjacent borders with Elgetol 2 to 4 quarts to 100 gallons preferably between green tip and full delayed-dormant (or at dormant if the same spray is to be applied to the trees for insect control), using 500 - 600 gallons per acre on the ground. Follow with usual wettable sulfur schedule. (b) Spray with liquid lime-sulfur 2 - 100 in pre-pink to first cover spray, inclusive, followed by wettable sulfur in remainder of covers. (This schedule would probably cause severe injury to all varieties sprayed.) (c) Use wettable sulfur (or Fermate, or sulfur plus Fermate) program as usual, but increase the dosage (in the tank) by at least one-third for applications through first cover; and spray more frequently than usual; make sure to have the spray, or a dust, on ahead of or during infection periods; and be more particular than usual regarding thoroughness of coverage.

Q: Will Puratized be available for apple growers in 1946? How about mercury residue? A: The supply of Puratized Agricultural Spray will be limited, according to the distributor. According to fruit analyses made in 1945, no mercury residue was found where Puratized N5-E was used in first four sprays (pre-pink to first cover, inclusive).

Q: Is scab likely to be any earlier than usual next spring? A: In view of premature defoliation in scabby trees last summer and fall, scab ascospores should mature somewhat earlier this spring -- unless there is an unusually heavy and late snow cover.

Q: What sprays other than Elgetol may be used to eradicate the apple scab fungus in the overwintered leaves? A: Sulfate of ammonia 100 pounds - 100 gallons, or nitrate of soda 100 pounds - 100 gallons plus 4 pounds calcium arsenite, should equal the Elgetol spray for killing the scab organism

in the overwintered leaves -- when applied at the same rate (500 - 600 gallons per acre). This rate, however, may supply more nitrogen than is needed for some orchards.

Q: Are there any advantages of using Fermate over wettable sulfurs in the apple spray program? A: Yes. (1) its use with lead arsenate, and without lime, will produce much less fruit russet on Baldwin, Delicious, etc.; (2) the mixture of Fermate one-half pound and one-half dosage of sulfur gives better control of apple scab than full dosage of sulfur or Fermate, and as good control of cedar rust as a full dosage of Fermate ($1\frac{1}{2}$ - 100).

Q: How much Fermate should a dust contain? What is the filler in a Fermate dust? A: A Fermate dust for varieties subject to fruit russet should contain 10% Fermate (remainder talc or talc and lead arsenate). For non-russeting varieties, it should contain 5% Fermate (remainder dusting sulfur or sulfur and lead arsenate).

Q: What is the best spray program for Baldwin and Delicious to control pests without russeting the fruit? A: Use Fermate $1\frac{1}{2}$ - 100 in pre-blossom, calyx and first cover sprays (or through second cover if cedar rust is concerned), followed by Fermate 1 - 100 in later covers. For supplemental dust, use Fermate-talc dust (see preceding paragraph).

Q: Is a ground spray of Elgetol worthwhile for fruit crops other than apples? If so, which fruits and for what diseases? A: Yes, for brown rot of stone fruits (4 quarts - 100); pear scab (2 to 4 quarts - 100); and for black rot of grapes (2 quarts - 100 on vines, 4 quarts - 100 on ground) -- before green tissue is exposed.

Q: What constitutes a good wettable sulfur? A: A sulfur that contains the right amount of a wetting agent that is compatible with other standard spray materials; and a mixture that contains at least half of its sulfur in particles less than 10 microns in diameter. The degree of coverage and the interval between sprays are at least as important as the particle size in the sulfur preparation -- probably more important.

Q: On an equal sulfur basis will the best wettable sulfur products control apple scab as well as lime-sulfur? A: Although the best wettable sulfurs are the equal of lime-sulfur in preventing scab infections when applied ahead of rainy periods, yet a succession of wettable sulfur sprays is not as effective as a succession of lime-sulfur sprays because the latter have a post-rainy period effect in preventing scab infections as well as an eradicative effect on established new scab spots, which wettable sulfurs do not have.

-- O. C. Boyd

(News item in The Packer) Northampton, Mass., Jan. 4 -- It didn't take H. I. Bean, 85, of Northampton, long to get rid of his 1945 apple crop. Bean just sat under a tree and ate the entire crop--one apple. He had hoped for a harvest of 2,500 bushels but a freeze depleted his crop.

GROWING STRAWBERRIES ON A POULTRY FARM

Although only 1/40 of the farms in the United states are classed as fruit farms, they produce 5/6 of our national fruit crop. This suggests that fruit growing is a specialized business. Yet we find in the eastern states an occasional poultryman, dairyman, or vegetable grower who is operating a fruit enterprise as a sideline, with considerable success. The chances of success with an apple orchard on such a farm are less favorable than with a strawberry planting since the latter involves little if any spraying or dusting. The possibilities of growing half an acre, more or less, of strawberries on a poultry farm in Massachusetts are well worth considering.

Strawberries require considerable hand labor. No one should attempt to grow this fruit unless favorable soil and enough labor at the right time are available. An inexperienced grower is likely to set strawberry plants on poorly prepared soil and then ask what kind of fertilizer should be used, instead of fitting the soil at least a year in advance. He may even attempt to produce a crop of berries by heavy fertilization in the spring of the bearing year. Such a practice cannot be too strongly condemned.

How many strawberries may one expect from an acre? The average for Massachusetts is less than 3,000 quarts. One Massachusetts grower, however, actually harvested 12,000 quarts from an acre. But he did it by taking a year in advance to prepare the land. During that time he grew three cover crops, each of which was fertilized and plowed under. The soil was well supplied with organic matter, an important factor in a strawberry planting. A yield of from 5,000 to 8,000 quarts per acre is a reasonable goal. It is better to aim for a heavy yield on half an acre than to spread one's efforts over a larger area. The beginner should start in a small way and plant no more than he is able to handle properly.

The bulk of the strawberry harvest comes between June 10 and June 25. Ample help must be available during that period. Other busy seasons in a strawberry planting are planting time, around the first of May, the season for cultivating, weeding, and spacing of runners in summer and early fall, and the mulching season around the first of November.

And now for a few suggestions for those poultrymen interested in making a start in the strawberry business. If the poultry enterprise is to be curtailed somewhat, a bit of diversification along fruit lines may take the form of a well planned strawberry planting.

(1) Soil. The ideal soil is fertile, well drained, retentive of moisture, and well supplied with organic matter. It is a waste of time to set plants on a poorly adapted soil. If the soil will grow a good crop of vegetables, flowers, or weeds, it has possibilities for strawberries.

(2) Source of plants. The best are none too good. Northern grown plants are preferred. Plants should be set while the weather is still cool and the soil well supplied with water. Care must be taken to prevent drying of roots. Roots begin to grow before weather conditions are favorable for top growth.

Thus, plants which are set in late April or very early May have a chance to get established before top growth, with its demand for water, begins.

(3) Varieties. Howard 17 or Premier is still a favorite, particularly on lighter soils. Catskill is an excellent variety where soil conditions favor a strong plant growth. The planting may well include both varieties.

(4) Planting systems. Opinions vary as to the ideal spacing of strawberry plants. The rows should be at least 3.5 feet apart and preferably 4.0 to 4.5. Plants may be set two feet apart in a row. Many growers use the matted row system; others prefer the spaced runner system. The latter, of course, requires much more hand labor.

(5) Weed control. A clean bed will facilitate harvest and lessen the amount of rot.

(6) Mulching. "Putting the plants to bed for the winter" is very important. A mulch of straw applied about the time the ground freezes in November prevents deep freezing of the soil and consequent heaving of the plants. Mulching also helps to protect the blossoms to some extent against spring frosts and it helps to keep the berries clean.

Commercial strawberry growers seldom hold the planting over for a second year's crop. This means planting a new bed each year. Even though weeds have been well controlled, the second crop may be disappointing and the berries are likely to be smaller.

On a poultry farm where poultry manure is plentiful there is a danger of using this fertilizer too liberally. The best amount to use can be determined only by experiment. Certainly it can be used to good advantage as a fertilizer for the cover crop or crops to be plowed under. This may be the best way to use it. Some may also be plowed under or harrowed in before setting the plants. Under no circumstances should a heavy poultry litter be used as a mulch, nor should it be broadcast over the planting in the spring. Too liberal use of poultry manure with its fairly high content of nitrogen will result in more rotten berries, particularly in a wet season.

The leaves which a runner plant develops the first season determine the number and size of the berries it will produce the following June. The successful strawberry grower is therefore interested in growing vigorous runner plants the first season instead of trying to stimulate them into profitable production the following spring.

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WINTER FRUIT SCHOOL. The school for commercial fruit growers, held in Amherst January 21-24, was apparently a success. Approximately 100 were present at each session, including at least 15 returned veterans. The large proportion of relatively young growers reflects a forward looking industry.

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Getting a Paper Out is sometimes fun, but it is never a picnic. If we print jokes, people say we are silly. If we don't, they say we are too serious. If we clip things from other papers, we are too lazy to write 'em ourselves. If we don't, we are too fond of our own stuff. If we print contributions, the paper is filled with junk. If we don't, we don't appreciate true genius. Now, like as not, someone will say we swiped this piece from some other paper. WE DID.

NOTES ON NEW PEACH VARIETIES

There is no question that the three varieties, Golden Jubilee, Halehaven, and Elberta form the backbone of peach growing in Massachusetts. The several other varieties recommended for commercial planting, or for trial, are to fill in or extend the season where this is desirable.

The chart "Ripening Season of Peach Varieties in Massachusetts" gives an overall picture of ripening dates. Varieties recommended for planting in Massachusetts are starred.

The solid line represents the average picking season. It was obtained by averaging the dates of the first picking and the dates of the last picking for three or more years unless 1 year or 2 years is indicated. The dotted line shows the variation in picking seasons. The first dot shows the earliest date on which the variety was ever picked; the last dot, the latest date. These two dates are not in the same year unless the number of years involved is very limited. If many years are included, there is apt to be more variation in season and the dotted line will be longer.

Marigold is a yellow fleshed, semi-cling to free, small to medium sized peach of good quality. It is quite bud hardy; the best of the very early peaches.

Fisher, a bud sport of Valiant, is yellow fleshed, semi-cling, of only fair quality, and ripens unevenly. It is very hardy in wood and is said to be hardy in bud.

Raritan Rose (Hale x Cumberland) is one of the newer New Jersey introductions. It is white fleshed, usually free, fair to good quality, but apt to be soft and stringy at times. It is fairly hardy in bud and seems worthy of trial.

Oriole is yellow fleshed, free-stone, good in quality, small to medium sized, needs heavy thinning, very hardy in bud and wood. Many growers object to its lack of size.

Red Haven (Halehaven x Kalhaven), a Michigan peach, is yellow fleshed, free when fully ripe, unusually attractive because of the brilliant red blush, has thick tough skin, very firm flesh, fair quality, is said to be a heavy yielder, to require heavy thinning, and to be much hardier than Elberta but not so hardy as South Haven or Rochester.

Golden Globe is a large, round, yellow fleshed, freestone of high quality. Unfortunately, its buds are a bit tender for Massachusetts.

Triogem (Hale x Marigold), one of the newer New Jersey varieties, is a yellow fleshed, freestone of very high quality and very attractive appearance. It is said to require good soil, good culture and heavy thinning. Bud hardiness is fair but not up to Greensboro or Carman. It hangs to the tree well. It appears to be susceptible to brown rot.

Sunhigh (Hale x 40 CS), another of the newer New Jersey introductions,

is yellow fleshed, semi-cling to free, very good quality, probably a little hardier than Elberta in bud. It is worthy of trial although its tendency to cling and nearness to Halehaven season may eliminate it.

Goldeneast is a beautiful, extra large, fine flavored, yellow freestone. A few may have a place on unusually favorable sites but in general the buds are a little too tender for Massachusetts.

Red Rose (Hale x Delicious), another of the newer introductions from New Jersey, is white fleshed, freestone, of good quality, usually firm but sometimes soft and stringy. It yields well and is said to be hardy in New Jersey.

Pacemaker (Hale x Marigold), a recent New Jersey introduction, is a very attractive, yellow fleshed, freestone, of very good quality but is probably too tender in bud for Massachusetts.

Summercrest (Hale x Cumberland), also recently introduced by New Jersey, is a yellow fleshed freestone of very good quality. It is fairly attractive although at times it does not color up well. It is said to be better on soils not too high in fertility. It yields well but the fruit does not hang to the tree well. Buds are fairly hardy but not up to Greensboro or Carman.

Kalhaven (Hale x Kalamazoo), a recent introduction from Michigan, is yellow fleshed, freestone with a tendency to cling, fair flavored, and yields well. Michigan reports it to be above average in hardiness. It is in the same season as Summercrest. So far Summercrest has the edge but Kalhaven seems worthy of trial.

Sungold originated as a chance seedling in Iowa and is said to have borne a crop after withstanding -25° F. It is a yellow fleshed, freestone, of very good quality. It sets heavy crops and needs considerable thinning. The fruit is medium size or a little larger. The tree is a semi-dwarf like J. H. Hale. It seems worthy of trial.

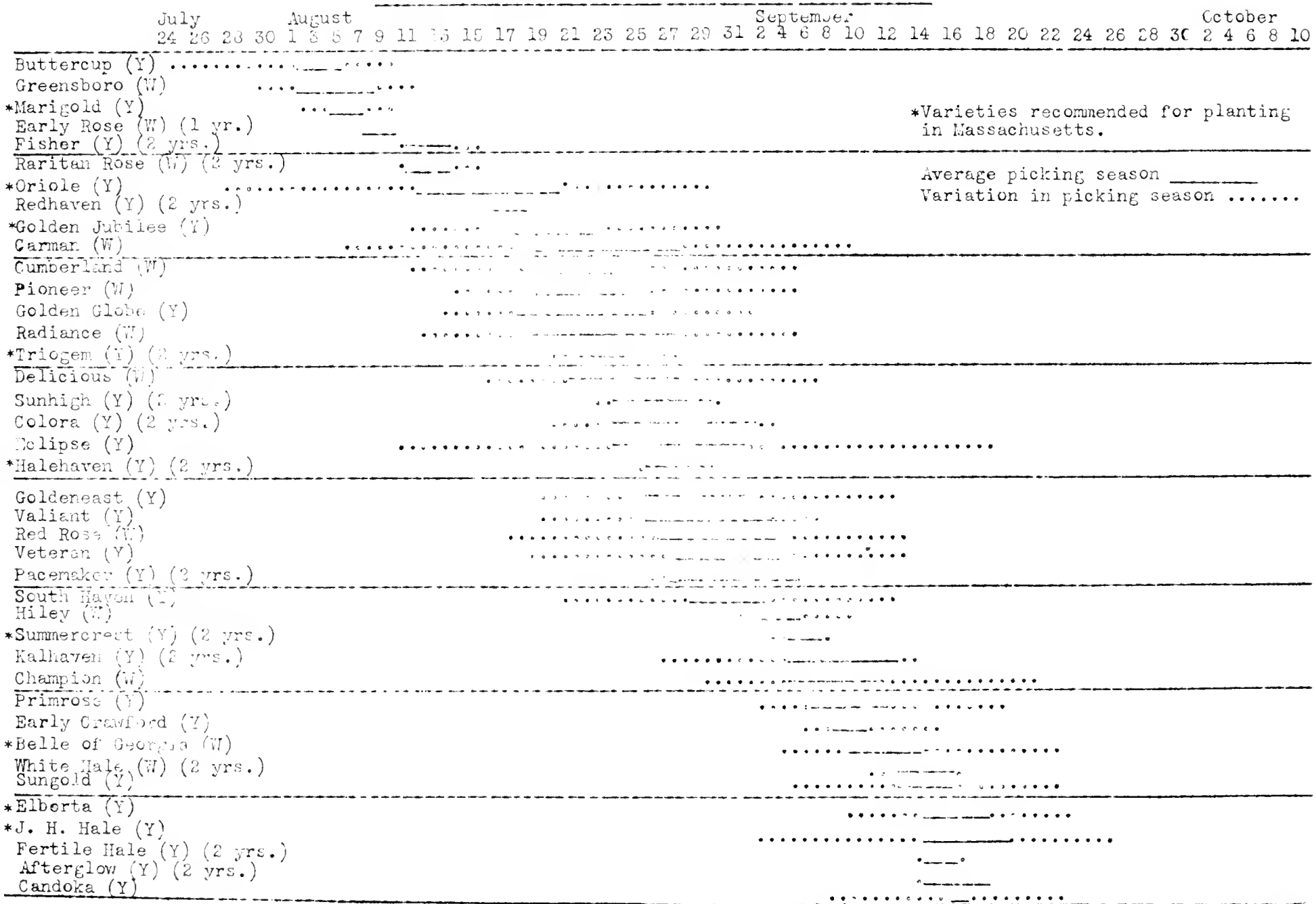
White Hale (Hale open pollinated) is a large, round attractive freestone - a Hale type with white flesh. Thus far the quality has not been too good. Its season is probably after Elberta rather than before as shown on the chart which represents only two crops, one of which ripened abnormally early.

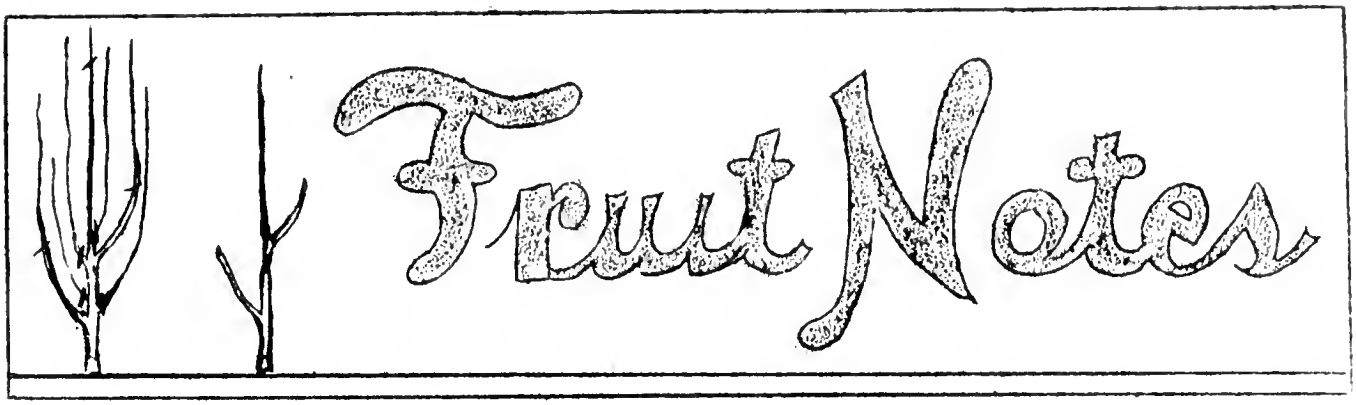
Fertile Hale is supposedly a self-fertile sport of the self-sterile J. H. Hale. Since fertile sports of Hale have been reported from three states, they may not all be the same. The variety as it appears in the College Orchard has not been very impressive.

Afterglow (Hale by N. J. seedling) is a yellow fleshed, fairly attractive freestone, better in quality than Elberta. It yields well and is hardier than Elberta. The normal ripening season is probably slightly later than shown in the chart.

-- J. S. Bailey

## RIPENING SEASON OF PEACH VARIETIES IN MASSACHUSETTS






March 30, 1946

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## WHAT THE VARIETY SURVEY REVEALS

In analyzing the 77 returns of a questionnaire on apple varieties some interesting trends were revealed as to what growers are thinking about in their choice of varieties.

While the survey did not make it possible to figure accurately the percent of each variety which the growers would plant in the future, it did indicate that the numbers of McIntosh will be materially reduced. Growers are now thinking in terms of 50 percent McIntosh instead of 70 to 80 percent. Baldwin will still be planted by many growers, but it will not figure as prominently in the variety picture as it has in the past.

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

Varieties such as Cortland, Delicious or its red strains, Early McIntosh, Rome Beauty and its red strains, and Red Spy appear to be slated for slight to moderate increases.

Gravenstein and its red strain, Golden Delicious, Rhode Island Greening, Macoun, and possibly Red Astrachan will just about hold their own; but Wealthy, Yellow Transparent, Duchess, Roxbury Russet, Winter Banana, Williams, Kendall, Stark, and Wagener seem to be on the way out. In general, red strains are preferred to standard varieties. Richared is the popular red strain of Delicious, with Starking meeting with little favor.

The accompanying table shows what the growers think of the different varieties. Column 1 indicates the number of growers who are now growing the variety; column 2, the number who would select the variety for a new commercial planting; and column 3, the number who have grown the variety but would now discard it.

| Variety | No. of growers now growing variety | No. growers who would plant in future | No. growers who would discard |
|---|---|---|---|
| Baldwin | 70 | 44 | 10 |
| Cortland | 60 | 51 | 3 |
| *Delicious | 45 | 11 | 7 |
| Richared | 31 | 33 | 0 |
| Starring | 15 | 1 | 4 |
| *Other Red Strain | 8 | 16 | 0 |
| Duchess | 25 | 5 | 21 |
| Early McIntosh | 47 | 40 | 1 |
| Golden Delicious | 27 | 11 | 8 |
| Gravenstein | 46 | 8 | 13 |
| Red Gravenstein | 28 | 32 | 3 |
| Kendall | 22 | 5 | 16 |
| Macoun | 30 | 19 | 10 |
| McIntosh | 76 | 58 | 0 |
| Milton | 15 | 9 | 4 |
| Northern Spy | 39 | 10 | 10 |
| Red Spy | 22 | 18 | 2 |
| Red Astrachan | 32 | 15 | 17 |
| R. I. Greening | 35 | 19 | 14 |
| *Rome | 11 | 8 | 2 |
| Gallia | 7 | 16 | 1 |
| *Other Red Strain | 2 | 4 | 0 |
| Roxbury Russet | 13 | 3 | 19 |
| Stark | 9 | 2 | 13 |
| Wagener | 19 | 4 | 13 |
| Wealthy | 52 | 14 | 23 |
| Williams | 11 | 1 | 17 |
| Winter Banana | 12 | 1 | 18 |
| Yellow Transparent | 17 | 7 | 21 |

One questionnaire was from a grower who does not have an orchard now, but he plans to set one this spring. This is the explanation for only 76 growers having McIntosh. Some growers failed to answer the question in column 2 and others answered it only with the idea of adding to their present plantation which will explain why the figures in columns 2 and 3 do not total that of column 1.

One other point which the survey brings out is the attempt of many growers to choose varieties which will extend the harvesting and marketing seasons. This is particularly true among those growers who now have large

acreages of McIntosh. Growers are beginning to see the folly of a one variety orchard.

There were too few returns of the peach and strawberry questionnaires to give any detailed report, but they did indicate some interesting trends. The peach survey shows that Elberta is still the leading peach variety with Golden Jubilee a close second. Halehaven ranks a good third with J. H. Hale a poor fourth. Of the newer varieties, Summercrest and Triogem appear to have made a hit with some growers. Strawberries show a reversal of form with the old standby Howard 17 losing first place to Catskill, although it is still a strong second. There are not any other varieties which show much strength, except Sparkle, a new variety, which looks as if it may find a place in the variety picture.

-- W. D. Weeks

## BLOSSOM THINNING SPRAYS

The prospect of a heavy apple crop in 1946 and a light crop in 1947 has focused attention on the possibility of using blossom thinning sprays to reduce the 1946 crop and possibly increase the 1947 crop. Unfortunately, we know too little about these sprays to warrant recommendation for general use. Some growers have used them with good success. The on-year crop of biennial bearing trees has been reduced and at the same time fruit buds for the succeeding year's crop have been formed. Others have had less success. Elgetol has been the most used. We were able to reduce set by spraying at full bloom with the usual harvest sprays last year, but the season was abnormal and we do not yet know what the effects will be. Suggestions and directions for growers desiring to experiment with blossom thinning sprays are being prepared and will be sent on request.

-- J. K. Shaw

## COATING BEES WITH POLLEN

From time to time the question is raised concerning a device for coating bees with pollen as they leave the hive to fly to the trees. Such a device was made in the early 1930's by Burrell and King. They reported that the method held promise.

Later workers have abandoned the idea, feeling that greater return would result from more emphasis on the use of strong colonies of bees. Present knowledge would seem to support this view. Whether anything of a practical nature could be worked out in conjunction with the pollen traps now available is problematical. Until we have definite information, it would not seem advisable from a practical standpoint to shift from the present suggestion that strong colonies be used for orchard pollination.

-- F. R. Shaw

WALT DISNEY'S next movie will be "JOHNNY APPLESEED," it is reported.

THE APPLE SCAB OUTLOOK

The number of scab spore cases (perithecia) developing in the overwintered leaves is abnormally large this spring due to the abundance of heavily scabbed leaves. In the College orchards perithecial development and fruit bud development are approximately the same as they were at this date (March 26) last year. With McIntosh fruit buds in the silver tip stage, about one-fifth of the old scabbed leaves show scab spores reaching maturity in a small percent of the perithecia. The remainder of the perithecia contain either no spores at all or only immature winter spores (ascospores).

Scab spore development in one South Amherst orchard is in the same stage as here at the College, while in another orchard perithecia are considerably less advanced. The most advanced stage of ascospores so far observed was in a leaf sample from Wallace Pratt of Bridgewater (Plymouth County) where 10% of the leaves showed a goodly number of mature spores at the swelled bud stage (March 19).

Had it not been for the very dry weather during the past week of mild temperatures, scab spore development would be even farther along than it is now. Should cool, wet weather prevail in the near future, scab spores will develop much faster than fruit buds. If the present kind of weather (warm today with showers predicted for tomorrow) should last for several days, a small portion of the ascospore supply will be ready to shoot by the time the fruit buds reach the green tip to early delayed dormant stage.

Last year at this same date and corresponding fruit bud stage, the weather turned very warm and remained so for a full week, bringing fruit buds in Amherst into pre-pink by April 5. It is hoped, of course, that such will not be the case again this year.

The accompanying table indicates the time of season in past years when McIntosh fruit buds in Amherst reached the silver tip stage, and the corresponding stages of scab ascospore development; also when ascospores were sufficiently matured to discharge in the orchard during each of those years.

| Year | Buds in Silver Tip Stage | Scab Ascospore Stage | First Spore Discharge | |
|---|---|---|---|---|
| | | | Date | Bud Stage |
| 1946 | March 24-27 | Only a few ripe spores; none shooting | 4/2(?) | Green tip (?) |
| 1945 | March 26 | " " | 4/2 | Pre-pre-pink |
| 1944 | April 11-17 | Few spores mature, shooting lightly | 4/11 | Silver tip |
| 1943 | April 19-23 | (Same as 1945, 1946) | 5/3 | Late del. dormant |
| 1942 | April 8-10 | Asci present but no spores formed | 4/24 | Pre-pre-pink |
| 1941 | April 14-15 | (Same as 1945, 1946) | 4/17 | Del. dormant |

In most past seasons, a small percent of the scab ascopores were ready for discharge, in some orchards at least, at the delayed dormant bud stage ($\frac{1}{4}$ - $\frac{1}{2}$ inch green tip). Our records over the past sixteen years indicate that this situation is not dangerous, even in McIntosh, because under such conditions scab infections either do not occur or are quite unimportant. However, if ascospore development is abnormally advanced, with possible heavy discharge during that bud stage, it is advisable to include a copper fungicide or Fermate in the oil spray, particularly if that spray is applied at the late delayed dormant stage. Enough Bordeaux powder, or a neutral copper fungicide, is added to give two pounds of metallic copper to 100 gallons of the oil spray, or $1\frac{1}{2}$ pounds of Fermate may be used.

As has been emphasized time and again this winter, this is one of the seasons occasionally encountered when it is considered highly advisable for many apple growers to apply a ground spray of Elgetol ($\frac{1}{2}$ to 1 gal. in 100 gals.) to reduce to a minimum the unusually heavy carryover of the scab fungus before very many of the ascospores reach maturity. This spray should be applied so as to wet all of the old leaves on the orchard floor including those along the borders, and at the rate of 500 to 600 gallons per acre. Any time now through the delayed dormant stage would be appropriate for the Elgetol spray, although care should be taken to avoid its drifting to the green leaf tips. Such a spray would not only eliminate the need for a fungicide in the delayed dormant oil spray on the trees, but it would permit the grower to proceed with his regular summer spray program with much more confidence in his effort and ability to prevent scab infections than would be the case if the huge, initial supply of scab spores were present.

This same spray of Elgetol may be used to advantage on the floor of the peach and plum orchard for brown rot control, and of the vineyard for black rot. However, the spray should be prepared at 1% concentration.

-- O. C. Boyd

## WHY SOME APPLE TREES GROW TOO TALL

Abnormal height in an apple tree may be due to one or more of the following causes: (1) crowding from closely adjacent trees, (2) lack of production, (3) two or more "leaders," (4) unwise heading back of top, and (5) variety. These five factors are arranged in approximately a descending order of importance. Let's examine them separately.

(1) The closely planted orchard with its gradual loss of lower limbs, results in tall trees because they are continually trying to overtop their neighbors to maintain their "place in the sun." In other words, the trees must grow upward because they can't grow in any other direction. Nearby buildings or shade trees have a similar effect.

(2) A good spray program tends to develop a drooping type of tree. The downward pull of 10 bushels of apples brings many of the branches to a horizontal position or lower, while a peck of apples on the same tree would permit the branches to grow upward. The average backyard tree is tall partly because it lacks this earthward pull.

(3) Double, triple or multiple tops, particularly if accompanied by a scanty crop of fruit, result in a taller than normal tree. Here we find competition between competing leaders similar to that between adjacent trees in a crowded planting. Each leader tries to overtop the other.

(4) We have all seen tall trees which the owner tried to lower by what we might call "high level topping." This may stimulate a tremendous growth of sprouts which make three or four feet of annual growth because they are replacing very vigorous, advantageously located branches. By the time these new limbs bear fruit the tree is not only taller than before but the new branches are too stiff to be bent downward appreciably. The result is an extremely tall, dense tree.

(5) A Northern Spy or an Early McIntosh tree has an upright habit of growth while a Rhode Island Greening or a Cortland is naturally more spreading. Even so, a bearing tree of the former varieties, assuming a good framework and ample spacing, will begin to droop and remain within reach if it comes into early production. If all of the above mentioned factors are as they should be, there will be no need to worry about a source of 20-foot ladders , or of pickers sufficiently courageous to climb them.

## SOME EARLY SPRING TIPS FOR FRUIT GROWERS

1. Lime. Anyone applying ground limestone in the orchard this year, should insist on getting high magnesium or dolomitic limestone. Our soils are inclined to be low in magnesium. High magnesium lime is the cheapest way of avoiding a magnesium deficiency.

2. Apple Scab. There is an exceptionally heavy carry-over of apple scab in many McIntosh orchards this spring. If the month of May is as rainy as in 1945, McIntosh growers will have a real fight on their hands in preventing scab infection. Scab spores are maturing early. A ground spray of Elgetol will help to solve the problem. The Pre-Pink and Pink sprays will be very important. It is easier to prevent a scab infection than to check it after it becomes established.

3. Bridge Grafting. Mice have damaged many fruit trees in Massachusetts during the past winter. It will pay to look over every tree where the grass is at all heavy. Trees surrounded by heavy grass are not only more subject to mouse injury, but the damage is likely to remain undetected. If bridge grafting is needed, well matured, flexible growths of last year should be cut while fairly dormant and kept in a cold, moist place. Bridging is most easily done about the time the leaves appear.

4. Tree Framework. The critical period in the development of a framework in a fruit tree are the second and third years. Fruit trees which were set either last year or the year before should be looked over this spring. Weak crotches, competing leaders, whorls of branches, and other symptoms of a poor framework should be corrected now instead of waiting until the trees are older, when larger cuts will be necessary.

5. Raspberry Spur Blight. Two troublesome diseases of raspberries, spur blight and anthracnose, may be controlled by properly timed applications of Fermate. These diseases are an important factor in reducing raspberry yields. Anyone interested in the control of spur blight and anthracnose will find full details in February Fruit Notes.

6. Blossom Thinning. Any apple grower interested in applying a blossom thinning spray to reduce the set of fruit in 1946 may obtain some practical suggestions by writing the Department of Pomology, M.S.C., Amherst, Mass. Although this practice cannot be generally recommended, it has possibilities and may well be tried on an experimental basis.

## MICHIGAN ELIMINATES INFESTED FRUIT TREES

A new law became operative in Michigan September 6, 1945 which will be of much benefit to the fruit industry. Following is a quotation from a letter recently received from C. A. Boyer, Chief, Bureau of Plant Industry, Lansing, Michigan:

"Our fruit growers and nurserymen in the state realize the necessity of giving more adequate protection to the fruit industry which shows an annual income of some $35,000,000. Since this program was instituted following the passage of the law, we have eradicated some 85,000 fruit trees and may I relate it is just in its infancy. It is our intention to have sufficient personnel, equipment and moneys to see that every fruit tree in the fruit growing area is either properly cared for or removed.

"It is interesting to note that we have been hiring bulldozers to remove these large apple trees, and the cost is about 12¢ on apples, 9¢ on cherry and pear, and as little as 5¢ on peaches. They did a commendable chore in removing trees. We likewise make our regular inspections for virus diseases at the proper season of the year, and are instrumental in having growers remove virus diseased peach trees. If you have any questions concerning the same, please feel free to call."

Any reader of Fruit Notes interested in studying the details of this new law (Destructive Insects and Plant Diseases, Act No. 72, Public Acts 1945) may obtain a copy by writing W. H. Thies, French Hall, M.S.C., Amherst, Mass.

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Fruit and Vegetable Producers get about 1/3 of Consumers' Dollar. Of the Consumers' Dollar spent for Fruits and Vegetables the Producer gets 35% and the Retailer, 30+%. The remaining 34+% goes to the Wholesaler (15%) and for Transportation (19%). Ten percent of the Retailer's share could go to the Retailer through certain economies in trimming of vegetables, etc., and 5% more through bringing stores together into larger units, thus giving the Producer 50% instead of 35%.

Preventing Frost Damage. By the time this issue of Fruit Notes is received a new mimeographed leaflet No. 134, "Frost Prevention for the Orchard," by W. D. Weeks will be available. A copy may be obtained from your County Extension office or from the State College. It tells the conditions under which frosts occur and offers some practical suggestions. If it were easy to insure against frost damage most growers would do something about it. For an orchard in a frosty location, however, preventive measures are both expensive and laborious.

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HOUSING for orchard workers will be the key to the labor problem, 36 members of Wenatchee Farm Workers Housing, Inc., agree. They plan to enlarge a $25,000 housing facility which started as a tent camp, adding new buildings. (Adequate housing at harvest time is also a critical problem in Massachusetts.)

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Boron Deficiency in Massachusetts Soils. Dr. F. E. Bear of Rutgers University states that crops growing on Gloucester, Merrimac, and Wethersfield soils are frequently benefitted by borax applications. These soils are all found in Massachusetts. Dr. A. B. Beaumont, State Conservationist for Massachusetts, advises that most of the outwash soils in Massachusetts are likely to need borax.

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Are you interested in irrigation? The writer has recently received two copies of an excellent booklet entitled, "Supplemental Irrigation." They are available on a loan basis to any reader of Fruit Notes.

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AMAZING RESULTS in the use of DDT on 800 acres of apples at Paw Paw, Virginia, are reported by Henry W. Miller, Jr. Codling moths trapped in 10 bait pails in May, rose from 546 in 1943 to 1,070 in 1944, to 2,536 in 1945. June figures were: 1943 - 204; 1944 - 236; 1945 - 60. July: 1943 - 365; 1944 - 1,048; 1945 - 42. Percent of wormy apples: 1942 - 2; 1943 - 11; 1944 - 22; 1945 - less than $\frac{1}{2}$ of 1.

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A few days' delay in mimeographing and mailing this issue of Fruit Notes is due in part to a heavy volume of work in the Mailing Room and a small staff plus a few part time student workers. Besides many individual releases, Fruit Notes is only one of several regular publications to go "through the mill." If it is held up temporarily we console ourselves by knowing that something of an emergency nature has priority, or perhaps the anticipated student assistance didn't materialize.

# Fruit Notes

April 30, 1946

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## SOME OBSERVATIONS ON EUROPEAN FRUIT GROWING

During the eight months recently spent with the army as a civilian instructor at the Biarritz American University, I had opportunity to observe some of the practices of fruit growers in southwestern France. Within a radius of 75 miles north and east of Biarritz there is little other than home orchard trees and the ever present small vineyard for local wine production. Open grown trees, usually in sod, are typically very high headed, little pruned and make slow growth. The fruit from such trees is used chiefly for cider although some of the best (about a U.S. Utility Grade) will be found on the retail market as mixed lots. In the Gironde Valley running from Toulouse to Bordeaux, fruit growing is one of the major types of farming.

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture, and County Extension Services cooperating.

Mixed tree fruits with some American apple varieties predominate around Montauban, plums at Agen and of course thousands of acres of grapes around Bordeaux. In this valley the soil is usually cultivated, but frequently the trees are very low headed, open center or goblet and very severely pruned. The War Period with its shortage of fertilizers and spray materials as well as tools and labor, has been pretty hard on the French fruit grower, but at best their methods and knowledge of pest control as well as most other practices are years behind what we enjoy. At a meeting in Toulouse with a group of French agricultural experts and fruit growers, I found them keenly interested in learning about new varieties and especially in our system of getting information to the growers - the Extension Service.

-- A. P. French

## DDT IN ORIENTAL FRUIT MOTH CONTROL

The Oriental fruit moth is the most destructive pest of peaches. Some growers might nominate the plum curculio or brown rot for this doubtful honor, but the characteristic habit of the newly hatched fruit moth worm to enter the fruit without leaving noticeable evidence of infestation seems to overcome all other arguments.

There are three or four generations annually, depending upon the season and locality. Each generation requires about 40 days to develop, and the moths are present in greatest numbers about June 1, July 15, August 1, and September 15. In cool seasons and locations, the fourth generation may not develop, or it may not appear until after the fruit is harvested. Strangely enough, the fruit moth is less serious in the South than might be expected because the last two generations develop after the fruit is mature and the twigs have hardened, making it difficult to find suitable food to produce a strong and abundant over-wintering population.

Worms of the first generation, and a large part of the second generation, attack the tender new growth of the twigs which they enter at the terminal bud, or at the base of a new leaf and bore through the pith for 2 or 3 inches. Apparently, they prefer the twig growth to the young fruit until after the stone-hardening period and they may bore into several twigs before they complete their feeding.

Many newly hatched worms enter the fruit near the stem where the tiny hole heals quickly and is inconspicuous at harvest, misleading the consumer to think that the fruit is sound. In fact, many of the most prominent holes in mature fruit are exit holes showing that the worms have left. Entrance holes on the side of the fruit are usually where the fruit touches another fruit, a leaf or twig and are distinguished by masses of dried "gum." This habit puts a premium on careful thinning.

Fortunately, the Oriental fruit moth is readily attacked by several parasites. Liberations of these beneficial insects have held the pest in check in many places but they have seldom given the freedom from wormy fruit that careful growers desire. Sprays of fixed nicotine and dusts of a sulfur-oil-talc mixture have been helpful and some growers have used them satisfactorily. Recently, it has been found that DDT is very effective against this

pest and that it is harmless to peach foliage, bark, and fruit, and can be combined safely with sulfur and other fungicides.

The preferred forms of DDT for this purpose are wettable powder or dust. The wettable powder should be added to provide one (1) pound of actual DDT in each 100 gallons of spray. If the powder contains 50% DDT, use two (2) pounds in 100 gallons. A 40% powder requires two and one-half ($2\frac{1}{2}$) pounds; and a 25% powder needs four (4) pounds. Wettable sulfur may be added as needed for brown rot control. Where dusting is desirable a 5% DDT-sulfur dust or a 5% DDT-sulfur-talc dust is suggested.

At present, treatments are concentrated against the second generation and applications are suggested at 10-day intervals beginning about July 15. Until further information on residue tolerance is available, peaches should not be treated with DDT less than 3 weeks before harvest. Therefore, many of the common varieties of peaches can safely receive only one or two applications. Varieties ripening in September are subject to the greatest injury by the third generation worms and this application of DDT appears safe and practical on them.

DDT kills the moths and the worms of the Oriental fruit moth by contact with the spray or dust residue. Careful and regular applications should not only give good control of the worms but it should reduce the moth population to a minimum.

-- W. D. Whitcomb

GOOD CROP STILL IN PROSPECT DESPITE FROSTS (National Apple Institute Bulletin, April 26, 1946)

Having passed the halfway point in the period of freeze danger, the prospects for a large apple crop have been reduced only in a few areas. Telegraphic reports for this bulletin indicate that Western New York, the central part of the Appalachian belt, and parts of Ohio and Indiana have had serious but localized damage, while other areas have escaped severe losses.

New England: Total prospects affected about 5 percent by damage to Gravensteins, Greenings, Baldwins. McIntosh still promise big crop. New York: Average of five Hudson Valley fruit counties 35 to 40 percent of bloom gone, but enough left for good crop if weather is favorable through bloom. In Western New York, enough buds are left for a moderate crop; damage is spotty depending on altitude, varying from zero to over ninety percent. McIntosh and Cortland badly hurt; Spies and Romes probably suffered least. Orchards neglected last year did not set buds for this year. Appalachian Area: Bud kill heavy in central part of belt except on high ground. Yorks were hurt least, Delicious most. Blossoming generally one of heaviest on record. A few orchards neglected last year defoliated early resulting in sparse bloom. Total prospects for four states still good. New Jersey and Delaware: Some damage mainly confined to low areas. Ohio: Damage spotty on low sites reducing Delicious, Stayman, Baldwin, Duchess. Romes generally okay. Prospect for state continues average or better. Michigan: No frost damage to apples. Indiana: Vincennes and south okay. Central and south central badly hit; Delicious all killed in some orchards. Three-fourths of full crop possible for state. Illinois and Missouri: Main producing sections unhurt. Wisconsin:

No damage. Washington, Oregon, Idaho, and California are more nearly on schedule than the Midwest and East.

Probably in no previous year have so many expedients in frost protection measures been tried by growers as in the past few weeks. Few apple orchards in the East and Midwest are equipped with burners, but all sorts of improvised smudge producers have been used, including wet baled hay drenched with oil; oil pits in the ground with gunny sack wicking; old tires; old railroad ties; portable brush burners with smoky fuel.

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Reporting on frost damage in Monroe County, New York orchards, one observer with a sense of humor says: The injury must run from 25 to 50% kill of apple blossoms. It is irregular by trees, by varieties, by elevation, by location on the tree and by plain cussedness.

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## PROGRESS IN FRUIT MARKETING

At a statewide marketing conference held in Cambridge March 12 and 13, seven items of importance to the fruit industry were outlined, two of which were referred to the State College. A committee has since met to formulate a procedure as follows:

I. Expansion of store-door delivery of apples.

A. The Situation. (1) Store-door delivery of apples, by growers, saves much trucking and handling with attendant deterioration and keeps grower and retailer in direct contact. This contact opens the way to mutually agreeable arrangements on such things as grading, packaging, and handling in general. It should lead to the solution of some of our most serious and difficult marketing problems. (2) Some 5 to 10% of Massachusetts apples are now delivered by growers to retail stores. (3) Chain stores sell about 50% of the Massachusetts apple crop. All chains favor store-door delivery by growers. (4) Many independent stores sell few or no apples, but might merchandize apples effectively if assured a satisfactory store-door supply. (5) Buyers would rather deal in volume with large growers. Growers with smaller crops might have to assemble their apples at a central point to gain volume and uniformity. (6) Any procedure for store-door delivery must be mutually profitable and satisfactory, and it must fit the local situation. Details of procedure must therefore be developed locally by agreement between growers and retailers.

B. Procedure. (1) Submit the idea to growers for careful consideration. Retailers are already sold on the proposal. (a) Feature at twilight orchard meetings through the summer. Invite retailers to attend. (b) Take the afternoon session of the Farm and Home Week Program for a discussion of the problems of store-door delivery. (2) Finally, bring growers and retailers together in neighborhoods where there is the most interest, to develop satisfactory local arrangements.

The important thing is to get the problems of direct delivery into the open where they can be dealt with, and to avoid unnecessary mistakes until a satisfactory procedure emerges with experience. If store-door delivery can be made mutually profitable it will grow and spread fast enough.

II. Reduction in sales of immature McIntosh apples.

A. The Situation: Green McIntosh reach the market for a number of reasons. Among them are: (1) There seems to be a limited consumer demand for McIntosh apples in late August and early September. To the extent that early-picked McIntosh are a response to this demand, probably little can be done about it. (2) Aside from the pressure of consumer-demand, McIntosh apples are sometimes picked too early through fear of a heavy drop before they can be harvested. A part of this at least is grounded in experience and is not imagination. Some of the real problems are: (a) A serious shortage of help at harvest time. (b) Widespread shortages of magnesium and boron in Massachusetts orchards. When symptoms of either deficiency are apparent, apples are likely to drop before coloring, regardless of hormone applications. There is reason to believe that in years when weather conditions do not result in deficiency symptoms, the apples may still drop early and cannot be held on until they reach proper maturity by hormone applications. (c) McIntosh trees in Massachusetts are, in general, mature and so large that the shading problem in crowded orchards has become serious. These shade-grown apples on the lower parts of trees mature late or not at all. Inadequate pruning due to shortage of help, high nitrogen in the trees in late summer, and unfavorable weather conditions all aggravate the trouble.

B. Procedure. (1) Urge growers to allow apples to reach a reasonable stage of maturity before harvesting them, even if this means a 10 or 15 percent preharvest drop. Increased size and greatly improved finish on the rest of the crop should more than offset the drop. (2) Urge thinning of crowding trees and adequate pruning of remaining trees. (3) Intensify the campaign looking to the correction of mineral deficiencies in orchards. (4) Assist with the better adjustment of nitrogen applications to fit individual orchards. (5) Urge more effective use of hormone sprays where there is no mineral deficiency. (6) Urge spot picking. (7) Continue assistance in finding an adequate supply of harvest labor. (8) Urge the grading out and disposal of green fruit in the Fall. It gets no better in storage.

## SOME INTERESTING FACTS ABOUT APPLES

The original Baldwin tree which grew on the old Baldwin Farm, Chestnut Street, Wilmington, is reported to have blown down during a terrific storm which occurred September 23, 1815.

Apple seeds were in the Memorandum of 1629 of seeds to be sent to the Massachusetts Company. Thus it appears that the apple played a part in the very early history of the Massachusetts Bay Colony.

Among the varieties of apples which originated in Massachusetts are: Westfield Seek-no-further, Baldwin, Hubbardston, Sutton, Roxbury Russet, Williams, Tolman Sweet, Porter, and Mother.

In "Downing's Fruits," (Edition of 1866) 643 varieties of apples are discussed, and in 1879 the American Pomological Society endorsed 321 varieties of apples as being worthy of planting.

In 1648 Peregrin White, the first European born in New England, planted apple trees in Marshfield. This is the first known record of the planting of an apple tree in Massachusetts.

The apple appears to be a native of temperate Europe and Asia in the regions south of the Caucasus. Although the apple as we know it has been introduced to the United States we have several kinds of native crab apples which grow wild.

Until the beginning of the 20th Century practically all of our apple varieties originated as chance seedlings. Since that time much progress has been made in the development of new varieties through plant breeding, thereby combining the desirable qualities of two varieties. The Cortland, a cross between McIntosh and Ben Davis, is an example of this new development. Early McIntosh, Macoun, and others were also developed in that way.

The Westfield Seek-No-Further variety originated in the town of Westfield at least 150 years ago. In 1846 a committee of the New York State Agricultural Society investigated the plantings of this variety in the Connecticut Valley and reported as follows: "This truly excellent apple originated in Westfield, a beautiful meadow town about ten miles west of Springfield. For many miles up and down it is the apple par excellence of that locality. Whole orchards are planted to this fruit and nowhere does it flourish in higher luxuriance and perfection."

The apple is one of the oldest of our cultivated fruits. Carbonized apples have been found in the ancient lake habitations of Switzerland dating back to the Stone Age, but these are small and resemble those which still grow wild in the Swiss forests. These Stone Age people understood the art of drying and made extensive use of dried fruits, which were part of their winter food supply. Apples and pears were usually cut lengthwise and dried. In this drying process some specimens became carbonized. Specimens of these fruits are now on display in the National Museum.

John Chapman, familiarly known as Johnny Appleseed, a native of Leominster, Massachusetts, played a prominent part in the early history of apple growing in the United States. Chapman traveled through the Middle West on horseback carrying with him a bag of apple seed for distribution among the pioneers along the Western frontier. He believed that the pioneers would be more contented if they had fruit for home use. From earliest times the apple has been associated with the pioneer in his new home. No other fruit is so universally grown and so universally liked as the apple. A monument to the memory of Johnny Appleseed has been erected at his birthplace in Leominster to commemorate his contribution to the apple industry.

## A STUDY OF APPLE SCAB IN NEW YORK STATE

During the past 27 years the incubation periods of apple scab in western New York orchards, in the first important infection period of each year, has been made by W. D. Mills. The following table shows the approximate length of the incubation period over the range of mean temperatures encountered. These figures may be used as a rough guide in determining, after scab spots appear, which rainy period was responsible.

| Mean Temperatures During Incubation Period | Approximate Length of Incubation Period |
|---|---|
| 48-49 degrees F. | 17 days |
| 50-51 " " | 16 " |
| 52-53 " " | 15 " |
| 54-55 " " | 14 " |
| 56-57 " " | 13 " |
| 58-59 " " | 12 " |
| 60 " " | 11 " |
| 61-62 " " | 10 " |
| 63-64 " " | 9 " |
| 65-66 " " | 8 " |

As a result of the rainy period of April 25-27 in Massachusetts, unprotected trees of scab susceptible varieties may be expected to show scab spots around May 11-14, depending upon temperatures.

## POULTRY MANURE AND APPLE SCAB CONTROL

Many McIntosh growers are of the opinion that poultry manure has some influence on the scab problem. They cite as evidence the scabbiness of the average henyard tree. The situation seems to sum up about like this: A liberal application of poultry manure results in more terminal growth, more and larger leaves and possibly leaves into which the scab fungus can more easily gain entrance. The added leaf area requires more spray material if the tree is to be completely covered. Then, too, a dense, leafy tree dries off less readily after a rain. It may stay wet an hour longer than a thin tree. The net result is a more favorable set-up for scab development on a tree liberally fertilized with poultry manure.

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Talking about scab control before a group of New York growers, A. B. Burrell made this important point, - "Keeping the trees well protected is good, cheap insurance, which pays dividends. Let us not again be caught as most growers were in 1945."

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Most growers can apply 25 to 50% more tankfuls per day with present equipment by studying the layout and noting where time is lost. If more than 5 minutes are required to return to the filling station or to get the water and materials into the tank, the system needs reorganizing.

# Fruit Notes

May 31, 1946

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

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## DDT IN THE FRUIT PEST CONTROL PROGRAM

Experiments in many parts of the country have shown that DDT has proved more effective against many of the serious pests of agricultural crops than any other insecticide yet produced. When used in proper formulations, DDT has shown definite promise against such prominent pests as codling moth, Japanese beetle, Oriental fruit moth, gypsy moth, and others.

One of its great advantages is the fact that it is compatible with most of our common insecticides and fungicides, such as lead arsenate, cryolite, nicotine compounds, dinitro compounds, wettable sulfurs, fermate, etc. Its use is not recommended with strongly alkaline materials and it should not be used with lime.

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture and County Extension Services Cooperating.

Recent reports by the Federal Government state that "DDT has shown promise for the control of such important fruit-insect pests as the codling moth, apple leafhoppers, Oriental fruit moth, grape berry moth, grape leafhoppers, rose chafer, Japanese beetle, little fire ant on citrus in Florida, sucking bugs that cause distortion of peaches, and, in preliminary small-scale tests, some others."

DDT, however, is by no means a "cure all." It has not proved very effective against plum curculio, European red mite, or pear psylla, and results against apple maggot have not been very favorable.

DDT - although a high-powered insecticide which some think will revolutionize insect control - has a tricky habit of sometimes killing the wrong insect. Consequently, its use in solving certain problems may bring on others.

The fact is DDT will not kill all species of our insect pests, while it does kill some of those which destroy obnoxious insects and are therefore in themselves beneficial to us.

The fear has sometimes arisen that indiscriminate use of DDT might release consequences more harmful than the original threat. For example, DDT is ineffective against European red mite while at the same time destroying the natural enemies. Definite experiments have shown that some of the species of ladybeetles were killed when they came in contact with surfaces sprayed with DDT. Yet it is the general experience that DDT is ineffective against about the one species of this family which is a pest of the garden (Mexican bean beetle). Aphids in laboratory tests were unaffected by DDT while ladybeetles and syrphid flies promptly died.

In brief, like any promising material, DDT should be used intelligently, in proper formulation, and only against the particular pests for the control of which it has shown promise. Furthermore, until more definite information is available, DDT should not be applied to fruits within a month or six weeks of harvest.

Below are listed some of our more common fruit pests and their reaction toward DDT.

| Promising for control of: | Not as yet particularly successful against: |
|---|---|
| Codling moth | Plum curculio |
| Gypsy moth | European red mite and other mites |
| Japanese beetle (beetles and grubs) | Pear psylla |
| Rose chafer | Apple maggot |
| Leafhoppers | Many scale insects |
| Oriental fruit moth | Many species of aphids |
| Plant bugs (cause "cat facing" of peaches) | |

-- A. I. Bourne

STRANGE FACTS ABOUT FRUIT DISEASES

Apple Scab. 1. This disease is not caused by a single organism, but by a group of closely related strains or varieties of the species, Venturia inequalis. The McIntosh strain is only feebly parasitic on Baldwin and Wealthy, while the Wealthy strain is not injurious to McIntosh, but causes severe damage to Wealthy foliage and fruits in some of the mid-western states.

2. In order for the scab fungus to complete its life cycle, a typical sexual process is necessary. While primary infections are taking place in the spring, half of the ascospores coming from the old leaves are male and half are female in character. All of the summer spores, including their progeny throughout the period of secondary infections, resulting from a male ascospore are likewise male in character. The corresponding situation holds true for the progeny of the female ascospores. Late in the season when a leaf infected by both male and female forms of the fungus drops to the ground and dies, the scab fungus threads which formerly were confined to the region between the cuticle and epidermis, grow into the interior of the dead leaf where some of the cells of the male threads unite with cells of the female threads, thus effecting fertilization. This union is the beginning of the perithecium that bears the dreaded ascospores which start the scab trouble anew for the grower in the spring.

3. It is possible to cross different strains of the apple scab fungus. This has been done by initiating leaf infections from single ascospores of opposite sex from different scab strains and then harvesting the perithecia the following spring that develop in the infected leaf. The outcome is new strains of the scab fungus that behave differently from the original parents in degree of parasitism on the varieties concerned. Similar crossings occur very commonly in nature with many kinds of plant disease fungi, giving rise to new physiologic strains of the standard species and varieties. In fact, it constitutes a terrible handicap to plant breeders and plant pathologists who attempt to develop varieties of plants resistant to certain diseases.

Fire Blight. For many years it was supposed that the only ways in which the bacteria which ooze out from holdover cankers may spread from one place to another was by the splashing action of rain and by the flight of insects which feed upon or walk through the milky drops of bacterial ooze. A few years ago, it was discovered that the same sticky drops of ooze may be and commonly are drawn out into fine threads many feet in length and blown to distant points. This process provides another means of dissemination of the fire blight organism.

Peach Leaf Curl. The seasonal behavior of the fungus causing this disease is quite different from that for most other fruit disease organisms. In fact, it is not thoroughly understood yet in spite of much research on the subject. No one has ever been able to find evidences of twig and bark infections where the fungus could exist in either active or dormant condition during the long period of summer, fall and winter when the disease is considered to be in an inactive stage. In only a very few instances have there come reports that the curl fungus is able to attack the peach fruit. Other-

wise, the disease appears to be limited to the leaves that are produced early in the season, with no evidence of secondary spread.

However, it is known that thousands upon thousands of ascospores are produced on the surface of curled leaves and that these are able to multiply by budding in the same manner as yeast cells. These so-called bud cells or spores are known to carry over on and between the bud scales where they have ready access to the new shoot and leaves. It has also been learned that either the ascospores or their bud-progeny may survive on the surface of the limbs and twigs for an entire year and initiate the curl disease one year from the time they were normally expected to infect the new shoots.

The fact that the leaf curl spores winter over on the surface of the tree top makes it possible to obtain good control of the disease with a single disinfecting fungicidal spray. Perhaps the reason why bearing orchards well sprayed during the fruiting season are not so likely to be damaged from leaf curl as young trees is the eradicative action against the leaf curl spores of the sulfur dusts and sprays applied during the summer.

-- O. C. Boyd

## TRAINED DWARF FRUIT TREES

One of the most interesting pomological practices in France is the training of dwarf fruit trees. Apples and pears are the most frequently used for this purpose, but one also occasionally sees some of the stone fruits, especially the peach, so treated. Sometimes they are trained as horizontal cordons to form a low fence around the vegetable garden, but more frequently they are trained in upright position as espaliers on a trellis or against the garden wall. Much time and skill is required to properly develop and maintain the desired form, since they are usually pruned three times a year - late winter, June and September - and fruit spurs are forced to develop in abnormal positions instead of waiting for them to form in normal positions.

At one chateau we saw what might be called a commercial planting of these dwarf trees, two and one half acres in extent. Three different types of training were used: an open pyramidal type, a low, broad, hedge type and espalier. Every third row was espaliered against a concrete wall 8 feet high especially built for that purpose.

It must have cost plenty to "build" this orchard even in France where labor is ordinarily cheap. On the two and one half acres there stood 3,600 of these dwarf trees which produced about 5 metric tons annually or roughly 250 bushels - a rather low production for that acreage judged by our standards.

-- A. P. French

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FARM AND HOME WEEK CUT TO TWO DAYS - July 23 and 24. The Farm and Home Week committee has reduced the 1946 program to two days instead of three as originally scheduled. The dates are Tuesday, July 23, and Wednesday, July 24. Tuesday will be devoted to fruit growing, dairying, homemaking (flowers and food preservation), and youth. Wednesday's program will include homemaking, poultry, beekeeping, Valley crops, and goats.

# Do You Know:

That the 150th anniversary of the McIntosh apple will be celebrated in Canada this year? From an obscure beginning as a chance seedling on a farm in Ontario, the McIntosh has become one of the most popular apples in America. It now ranks first in production in New England by a wide margin.

That a 12-year old apple tree in eastern U. S. may develop approximately 60,000 leaves? In the Northwest the number may reach 75,000 or more. If the average leaf area is 4 square inches, covering both sides of every leaf of the former tree with spray materials is equivalent to covering a wall 15 feet high and 222 feet long.

That the heat of respiration in oranges at 32° F. is reported to vary between 427 and 979 British Thermal Units per ton per day, but at 100° F. it increases to 22,660 B.T.U.'s per ton per day? (A BTU is the amount of heat required to raise the temperature of 1 pound of water 1° F.) Oranges seem to get "all het up" about breathing.

That a fruit dessert capable of satisfying a soldier's appetite and also of contributing Vitamin C to his diet has been developed by the Western Regional Research Laboratory? It contains 60% fruit and 40% fruit juice jellied with pectin, is said to keep well in all climates, is easy to carry, and can be opened and eaten out of hand without dripping juice. The Army used 10,000,000 cans in the first three months of 1945. Both the pineapple, and one containing peaches, pears, cherries, apricots and white grapes are popular.

That the use of calcium as a firming agent is quite effective in preventing canned, fresh and frozen sliced McIntosh apples from becoming excessively soft or mushy when baked in a pie? The amount of calcium used and the length of treatment will vary depending upon the original firmness of the apples, the length of time they have been in storage, and the degree of firmness desired. This problem is being investigated by J. J. Powers and W. B. Esselen of the Food Technology Department at M.S.C.

That a frozen fruit puree has been developed as a means of utilizing fully ripe fruit which cannot be handled in the fresh fruit market? It can be made from any fully ripe, raw fruit which has a decided flavor. This product serves as a flavor base for ice cream, sherbet, frozen jellied fruits and beverages.

That the original McIntosh apple tree was injured by the burning of a nearby dwelling in 1894. The tree bore its last apples in 1908, died shortly afterwards and finally was removed in 1910 by a great grandson of John McIntosh, after whom the apple was named.

That, according to the U. S. Forest Service, there are 1,763,651,000,000 board feet of standing timber of saw log size in the nation? A fruit grower is inclined to speculate on the number of fruit containers that would make.

That a new material (2-4-D), combined with a nitrogenous fertilizer (urea) and a fungicide (fermate) is now being tested as a means of killing weeds, stimulating a growth of grass and protecting it against fungi? Tests are now under way at Beltsville, Md. under the supervision of P. C. March and J. W. Mitchell.

That, in Colonial days, 19 out of every 20 people were engaged in tilling the soil? The development of time-saving farm equipment and larger per acre yields have changed that ratio. Today only 5 out of 20 are engaged in producing our various agricultural crops.

That the 1946 acreage of strawberries in the U. S. (105,680) is considerably higher than in 1945 when 87,480 acres were planted? The 10 year average of 1935-44 was 149,430 acres.

That a light set of Delicious apples may in some cases be due to a peculiarity in the blossom of that variety? R. H. Roberts of Wisconsin finds that the structure of the Delicious blossom is such that honey bees do not readily pollinate it. He found that in 80% of their visits, honeybees extracted the nectar without bringing about pollination. Bumblebees apparently are more efficient in bringing about pollination in the Delicious variety.

That the Brockton Fair, after a lapse of many years, is again staging an adult Fruit and Vegetable Show this fall? The dates are September 8-14.

That damage by the codling moth is estimated at $31,000,000 annually? Other U.S.D.A. estimates are as follows: Plum curculio, $10,000,000; Japanese beetle, $3,490,000; and Mexican been beetle, $2,006,000.

That the value of New England farm products over a 5-year period (1940-44) amounted to $1,925,000,000? The total value of all products of New England farms in 1944, over $500,000,000, was almost double the 1940 value.

That we have almost unlimited supplies of nitrogen (in an unavailable form) in the United States? There are literally thousands of tons of nitrogen in the air over our farms. There are said to be enough Rock Phosphate deposits in Florida alone to last over 1,000 years with the main deposits in the Rockies just beginning to be tapped. Known potash deposits will last well over 100 years, with large foreign deposits available to supplement our domestic supplies, when and if necessary.

That young fruit trees set out in an old orchard can be given an extra drink of water by using the sprayer or a tank mounted on a truck? A supply of water, particularly during June and July, may be the one factor which determines whether these trees get off to a good start.

That fire losses on farms in the U. S. last year ($90,000,000) were the highest since 1932? Have you examined your farm buildings recently for fire hazards?

That large quantities of soil fertility go up in smoke when plant residues are burned? Nitrogen, which entered the plant from the soil, goes into the air as a gas while only such mineral elements as calcium and potassium remain in the ash. We have yet to see a good orchard in which the owner makes a regular practice of burning the grass instead of allowing it to remain to enrich the soil.

That at least 5 grains of pollen must reach the stigma of each apple blossom to bring about the development of a normal, well formed apple? The pistil of an apple blossom is a 5-parted affair and unless one pollen grain reaches each part of the divided tip a normal seed will not develop in each of the five sections of the ovary or core. If a pollen grain is placed on one of the stigma segments only, the resulting fruit, if it develops at all, will be lopsided. More than likely it will drop from the tree in the so-called June drop when the apples are competing with each other for water and other things needed in their development.

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A CORRECTION:-- In an April Fruit Notes article "DDT in Oriental Fruit Moth Control," two errors should be noted, as follows: Line 8 should read ".... about June 1, July 15, and September 1." The last sentence in the next to the last paragraph should read ".... and 3 applications of DDT appear safe ....."

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## MAGNESIUM IN THE APPLE ORCHARD

(Following is part of a paper written by Lawrence Southwick, formerly of the Pomology Department and now with a large chemical concern.)

Magnesium is one of the mineral elements essential to normal plant nutrition. As early as 1840, Liebig considered magnesium to be an essential element since it was found in considerable amounts in plant ash. Willstatter in 1906 first showed that magnesium is one of the constituents of chlorophyll and now it is recognized to be the key element in this substance which is so essential to green plants. With the aid of chlorophyll, the energy from the sun is utilized to build up plant tissue which, directly or indirectly, has supplied man with most of the necessities and luxuries of life.

Green chlorophyll contains 2.7 per cent of magnesium in its chemical makeup. However, since only about 10 per cent of the magnesium required for normal plant growth is contained in the chlorophyll, this element probably has other essential functions. Along with nitrogen, potassium, phosphorous, calcium, and sulfur, magnesium is a major nutrient element and is utilized in considerable quantity by orchard trees as well as other crop plants. When the supply of this element is insufficient, deficiency in crop plants such as tobacco, corn, potatoes and some vegetables has been a problem for a number of years in Atlantic coastal areas. In Florida magnesium requirements of citrus trees have not been satisfied by native soil supplies and fertilization

with magnesium compounds has become quite prevalent. Recently it was found that tung trees responded markedly to magnesium applications.

Symptoms of magnesium deficiency on apple trees have been recognized only very recently in this country although the trouble has been known in England, Canada, and New Zealand for several years. It is true that the symptoms have been observed for a number of years but the cause was usually identified as drought injury, spray burn, etc. Typical magnesium deficiency symptoms usually appear in late summer. In late July or August apparently normal trees develop a leaf scorch which characteristically appears as irregular areas on the leaf blades. This necrosis is often preceded by a fading out of the green color and with some varieties there is considerable leaf mottling and coloration. The first leaves to show deficiency scorch are usually the older ones near the bases of the current year's shoot growths and the scorch may progress upward as the season advances. Affected leaves often drop early, leaving bare stretches of wood. In serious cases most of the foliage may be affected and pre-harvest drop of fruit is hastened. Furthermore, apple quality is inferior and tree growth is reduced. Seriously deficient trees are not productive nor profitable. The extent and severity of magnesium deficiency in eastern apple orchards seems to be increasing. Hence, effective control measures are eagerly sought by growers.

Several approaches to the problem have proven more or less successful. Adequate soil applications of magnesium oxide and magnesium salts (such as Epsom salts) have given generally good results on young trees, but a much more delayed response has been characteristic of older trees. In many tests high magnesium or dolomitic limestone applications have been relatively ineffective unless the lime was thoroughly dug into the soil around the roots as was done by Boynton in New York.

The inclusion of Epsom salts in two or three post-blossom spray applications has been effective as was also the use of high magnesium spray lime in the cover sprays. Investigators have also shown that magnesium deficiency may be worse under conditions of high potassium nutrition. Boynton recently reported that magnesium deficiency leaf blotch was induced in McIntosh apple trees following fertilization for three or more years with potash.

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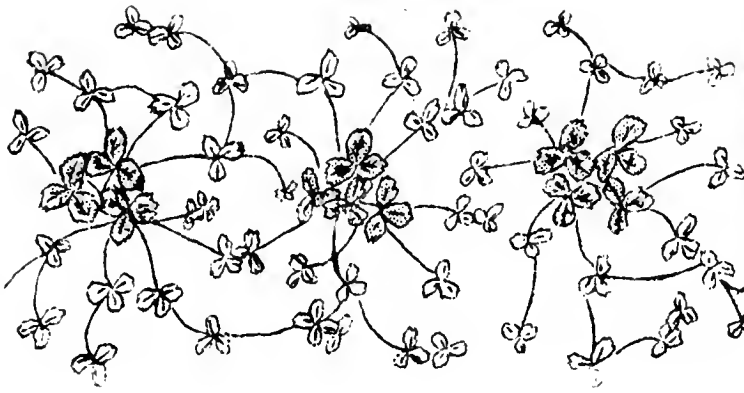
Give fools their gold
  And knaves their power,
Let Fortune's bauble
  Rise or fall,
Who sows a field
  Or trains a tree
Or plants a flower
  Is more than all.

---Whittier



# FRUIT NOTES

June 28, 1946

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



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## WHY THE ANNUAL BLOOM?

With the exception of a few varieties like Ben Davis which tend to develop blossoms at the tip of the terminal growth, apples commonly bloom on spurs which are found on wood at least two years old. This season many apple trees

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, Massachusetts State College, United States Department of Agriculture and County Extension Services Cooperating.

developed blossoms on both lateral and terminal buds of the 1945 growth. It was not at all uncommon to find practically every bud on the terminal growth developing into a cluster of late blossoms instead of showing the usual vegetative behavior. The weather in 1945 may have been responsible.

The initiation of fruit buds seems to be associated with hot, dry weather and an accumulation of carbohydrates in the tree. Until mid-summer of 1945 we had more than our share of wet weather. In fact both June and July, when fruit buds are normally differentiated, brought at least six inches of rainfall. Not until August did we encounter anything like a dry spell and by that time the terminal growth was completed, which meant many additional buds (on the terminal growth) which might be influenced to become flower buds instead of leaf buds. And that is apparently what happened, not in mid-summer, but perhaps as late as September.

It is a well known fact that about 9 months may elapse between the beginning of a fruit bud and the opening of the blossoms. Thus a bud which starts to develop in late July might be expected to show blossoms around the last of April, while a bud which got underway a month later might be correspondingly later in blooming. If such is the case, the delayed or secondary bloom on 1945 wood which was so apparent this spring is merely a reminder that fruit buds were forming over a longer period in 1945. It will be remembered that growing conditions were quite ideal during early summer and that diverted into vegetative growth the carbohydrates needed for fruit bud formation.

## CHANGES IN FRUIT DISEASE CONTROL DURING THE PAST TEN YEARS

The most outstanding change in the past ten years in control practices for fruit diseases involves the discovery, testing and adoption of new fungicides. Ten years ago, we were emerging from an intensive period of appraisal of the milder forms of sulfur, the elemental wettable sulfurs. These had replaced the old-time dry-mix sulfur-lime spray on orchard fruits. At that time, wettable sulfurs were recommended for apples in the cover sprays, but lime-sulfur still was the standard material for the pre-blossom and calyx applications. Little or nothing was known or said about sulfur applications on scab-susceptible varieties during bloom or as emergency treatments during rainy periods.

Likewise, the dinitro material, known as Elgetol, was being tested as an eradicant spray on the orchard floor for destroying the overwintering stage of the apple Scab fungus. During the past ten years, it has been given a definite place as an emergency spray in

the apple spray program.

Ten years ago, lime-sulfur and wettable sulfurs were still the standard spray materials for cedar rust, Brooks' spot and bitter rot. Then came the time when growers substituted wettable sulfurs plus emergency applications of sulfur dusts for the early season lime-sulfur sprays, in order to avoid the harmful effects of lime-sulfur to foliage, fruit and tree growth.

Shortly before the last war began, the organic fungicide, Fermate, was discovered. As a result of thorough trials in this state and elsewhere, it is now appearing in the printed spray chart for apples as a standard spray material for control of scab, black rot, Brooks' spot and bitter rot, and above all, for control of cedar-apple and quince rusts. In addition, it is now being recommended as the only effective and safe summer spray for control of spur blight of raspberries.

The development of Puratized is still more recent than the use of Fermate. This organic fungicide, likewise unknown to the fruit grower ten years ago, has in recent years been tested thoroughly and is now recommended to replace lime-sulfur as a protective and eradicant spray for scab in apple orchards. However, the Puratized materials may be considered still in the developmental or exploratory stage. Additional new organic fungicides are being tested thoroughly on fruit crops, and in a few more years some of them no doubt will find a definite place in our pest control charts. Outstanding among them is Phygon which at present looks very promising for control of scab on apples.

Hence in the line of knowledge gained and practices adopted in the control of fruit diseases alone, during the life of this Fruit Notes publication, changes have been relatively rapid and significant. We are now in the very midst of an intensive investigation of organic fungicides, and we may expect still further discoveries and adoption of new spray and dust materials that are economical to use, more effective than standard old materials, and safer as regards injury to the plants.

-- O. C. Boyd

## A VERSATILE FRUIT GROWER

(A borrowed editorial from Farmer's Almanac of the Air, by Walter Piper)

"Down in Essex County they call Harry Seagraves, of West Newbury, the Dean of the County's apple industry. His fame, however, is not confined to that section of the State, as he is equally well known throughout Massachusetts, and in fact throughout New England, as the very active operator of extensive Long Hill Orchards.

"Harry's achievements as a fruit producer are too well recognized to need any special comment here. The purpose of our current reference to Dean Harry is to tell of his skill in the art of handling bees.

"At the twilight meeting at Mrs. Osgood's orchard in Wenham last week, Harry was the first to spot a swarm of bees in one of the trees during the course of the tour of the orchard. In his characteristically energetic manner, he immediately assumed charge of the situation. He called for a hive and some boxes on which to set it under the swarm. Then, without use of anything resembling beekeepers' normal equipment, he proceeded (with the aid of some of the other twilighters) to shake the swarming colony into the hive for safe keeping and for future use in pollinating the orchard.

"All this was done to the accompaniment of excited squeals from feminine members of the party who marvelled at Harry's intrepidity and his calmness in action while literally surrounded by the busy buzzing members of the colony which he was introducing to its new home.

"The fact that honey bees are traditionally mild mannered, when handled right at swarming time, should not detract one whit from Harry's display of versatility in being able to act immediately to save this swarm for the orchard owner. It is just one more feather in the cap of a prominent Bay State orchard man, who might now well add the title of Bee King to the honorary degree which he has acquired as Dean of Essex County Fruit Growers."

## POISON IVY IN THE APPLE ORCHARD

The time of year has arrived to get rid of poison ivy under apple trees. This is best done by spraying the ivy with a solution of Ammate made up at the rate of 1 pound per gallon of water. However, a 100% kill may not result from the first spraying. Weed killing sprays seem to be less effective in shade than in full sunlight. In dense shade it may take two or more retreatments to get rid of all the ivy.

Very roughly, a gallon of spray will cover 100 square feet. The amount will vary according to the stand of ivy. The leaves should be thoroughly wetted but needn't drip. High pressure isn't necessary. A small compressed air sprayer is as good as a high powered rig. A flat fan-shaped spray such as that delivered by a Bordeaux or Monarch nozzle is best. Spraying is most effective when the ivy is growing rapidly but any time after the first leaves have fully expanded to late August will do.

Certain precautions should be observed when Ammate is used. Keep the spray off the apple leaves, in fact, off the leaves of any desirable plant. Wash the spraying equipment thoroughly after use because Ammate is corrosive on some metals. A little spray lime or soda added to the

wash water helps. Short exposure of the skin is harmless but long exposure should be avoided. Keep Ammate out of the eyes. Don't use it around blueberries or peaches. It is very toxic to these fruits. In fact, its use around fruits other than apple is not recommended until further information is available.

The use of any of the weed killers containing 2-4 D is recommended only to those who wish to do some experimenting. So far 2-4 D has given variable results against poison ivy. Since it is one of the so-called "hormone" sprays, it may do surprising things to plants at very low concentration. Follow carefully the manufacturer's direction for use of the spray and cleaning of equipment afterwards.

Even after the poison ivy has been killed the dead stems should not be handled carelessly for poisoning may result. The poisonous material is a resin which is in resin ducts in the bark of roots, stems, petioles and leaves. This resin is not destroyed when the plants are killed. It is so stable that it may remain active for a year or more. Hence, one should be careful to keep out of the smoke when burning poison ivy. Sooty particles of the resin carried along with the smoke may cause serious poisoning if they reach the skin of susceptible persons.

A word of caution to those who think themselves immune to ivy poisoning. This so-called immunity may end rather suddenly following excessive exposure to the toxin. The following is quoted from the bulletin, "Poisonivy and Poisonsumac," New York State College of Forestry at Syracuse University, Syracuse, N.Y.

"Most if not all persons who have never had a case of poison ivy dermatitis react negatively when an extract of the poison is applied to a very small area of their skin. Eskimos who live north of the natural range of poison ivy, and newborn babies have been thus patch-tested and showed no positive reaction. However, once a person has become sensitized he will react to the poison sometimes in dilutions as great as 1 to 1,000, 000. Sensitization requires the application of a certain amount of the poison to the skin. The amount varies with the individual, but that acquired by pulling up the vines, or handling the bruised leaves is usually sufficient. Most people can be sensitized by placing upon their skin a drop of the liquid from the cut or broken end of a leaf-stem (petiole). The ensuing reaction usually occurs within seven to twenty days. It can be seen, therefore, that it is extremely unwise to experiment with one's supposed immunity, even though in rare cases, continued exposure fails to produce dermatitis. Several instances are on record of individuals who throughout a long life handled the plant frequently with impunity, but who finally got the juice upon their skin once too often, and became severe hospital cases. It is often stated that immunity can be secured by chewing poison ivy leaves (especially in spring), but this practice may be exceedingly dangerous."

The bulletin mentioned above and Farmers' Bul. 1972, "Poison-ivy

Poison-oak and Poison-sumac," contain much interesting and valuable information about poison ivy.

J. S. Bailey

## GET RID OF THE CHOKECHERRIES

For those who have peaches or are thinking of planting peaches the time of year has arrived to get rid of the chokecherries around the orchard site. The chokecherry is the alternate host for the X-disease, or yellow-red virosis, a very serious virus disease of peaches. This disease travels very slowly from peach to peach but very rapidly from chokecherry to peach. The only known control is to get rid of the chokecherries in the vicinity of the orchard. These should be eliminated for a distance of 400 or 500 feet from the orchard.

Chokecherries can be eliminated most effectively by a weed killing spray. Cutting them off results in a forest of suckers and sprouts. Digging them out is not effective because any pieces of root left will send up sprouts. The most effective weed spray for this purpose is ammonium sulfamate, or Ammate, used at the rate of one pound per gallon of water. It is most effective if applied when plants are growing rapidly. It is less effective when applied after late August.

Since ammonium sulfamate is not a selective spray and is corrosive on certain metals, it must be used around desirable plants with care, and spraying equipment should be cleaned out very thoroughly after its use. It is known to be quite toxic to peach trees. Therefore, it may be used around the orchard but should not be used in the orchard.

J. S. Bailey

## SEEN IN THE FIELD

Humming Bird at Work. This spring for the first time we saw a humming bird visiting blueberry blossoms. The speed with which it flew from one tiny blossom to another was nothing short of amazing, and in doing so it probably supplemented the work of the bumblebee as a pollenizer.

An Oversized Crown Gall. In digging some old raspberry plants, one root, less than 1/4 inch in diameter carried a gall which was 1½ inches in diameter and 4 inches long. Other galls the size of a pea or larger were common.

Flowering Crab Blossoms on Late Growth. A young flowering crab tree in Amherst with a snowball bloom has one sprout which grew 7½ feet in 1945. It evidently continued to grow until late fall evidenced by the killing back of 6 inches of the immature tip. And yet there were blossoms on the sprout within 10 inches of the tip, which were probably initiated in late September or October because that particular wood didn't exist before the first of September.

An Odd Blackcap. In the crotch of an elm tree on the M.S.C. campus, about 8 feet from the ground, is a blackcap plant which thrived during the 1945 season and gives promise of bearing fruit this summer. The plant probably started from a seed dropped by a bird. If it is able to fruit in so hopeless a location, it is a reflection on a grower if he fails to get results with plants growing in a good soil.

Ammate Affects Apple Leaves. Several orchards are showing a peculiar yellowing of the leaves where nearby poison ivy was sprayed with Ammate last summer. On young trees, half of the leaves may be so affected. The yellowing, unlike that in magnesium deficiency, is confined to the veins and midrif of the leaf giving it a mottled appearance. If a spray intended for poison ivy reaches many of the leaves of the tree, the results may be disastrous.

Scab Eradication. Never before have we seen such widespread infection of McIntosh trees. Even in well sprayed orchards an occasional scab spot can be found while others are so hopelessly infected that further fungicidal sprays are of doubtful value. Everybody is interested in using Puratized or lime sulfur and many are applying one or the other. The results seem to range from near failure to perfection. The former may be explained on the basis of poor coverage or infections not evident when the spray was applied. Amateurs who had someone spray their trees only to find that the leaves dried up will naturally bla me the spray instead of the already ruined foliage.

## TEN YEARS OF FRUIT NOTES

Our monthly publication had its beginnings about the time of the 1936 flood. The first issue in our file is dated March of that year. In the intervening years we have touched on a fairly wide range of fruit topics without attempting to give all of the details. If Fruit Notes has accomplished anything more than serving to remind readers of new developments, it may be along the line of emphasizing such fundamental things as better spraying, correcting magnesium deficiency, pollination and orchard management. Any reader with an idea which needs to be presented is invited to send his suggestions in writing to the editor.

## STRAWBERRY "NUBBINS"

Undersized strawberries with hard undeveloped tips are of common occurrence particularly in beds two or more years old. Many explanations are offered such as frost and poor pollination, which may have no relation to the problem in a particular planting. Self fruitful varieties seldom suffer from faulty pollination. In fact, a number of obscure little bees are generally active while strawberries are in bloom. And if an insect crawls over a blossom at all, it would be most likely to contact that part which becomes the tip of the berry. Frost, too can be discounted because "nubbins" come mainly from midseason or later blossoms, not from

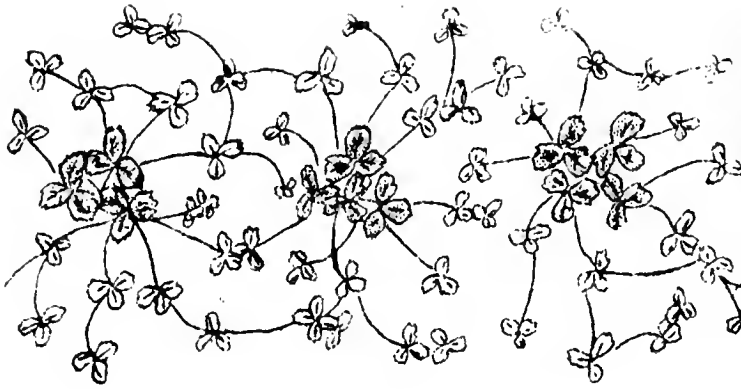
the first blossoms. We therefore offer this possible explanation. It takes good roots and good leaves to produce good berries. The poorer the root system, the more handicapped the leaves and the less of needed materials will the berries on that plant receive. The tip of the berry is farthest removed from the source of supply. If there is not enough water, carbohydrates, etc., entering the berry, the tip cells will fail to develop. So the problem may rest almost entirely on the roots. If they are badly damaged by Black Root (a fungus disease) that shortcoming will be felt in the leaves and in the berries. Large, vigorous plants with turgid, green leaves must have normal roots, and such plants tend to produce large, well formed berries. Poor roots, plus a droughty soil, are like to produce "nubbins."

## NURSERY INSPECTION TRIP

For the past 25 years various members of the Pomology Department have made annual trips to nurseries in the East, Midwest and South to inspect fruit trees for Trueness to Name. This summer two such trips are planned, the first of which got underway June 23. As this is being written the crew consisting of A. P. French, O. C. Roberts, W. D. Weeks, and W. H. Thies is at Princess Anne, Maryland for two days. Other stops include Cheriton, Virginia and Berlin, Maryland and Selbyville, Delaware. The inspection of nursery stock involves careful observations of the vegetative characteristics of a large number of varieties. It makes possible the purchase of trees which will bear fruit of the desired variety. It has practically eliminated the sale of misnamed trees in the East. The list of nurseries which avail themselves of this service may be obtained from the Pomology Department on request.

## SCHOOLS FOR HARVEST LABOR SUPERVISORS PLANNED

To facilitate the handling of inexperienced apple pickers, at least two sessions with picking crew foremen in Worcester and Middlesex Counties, during the late summer are being planned. It is not the intent of these schools to urge uniformity in picking methods, but to cover the many items which contribute to a smoothly running harvest. The schools will be limited to actual or prospective foremen of picking crews. Watch for announcement of dates and places of meeting.



# FRUIT NOTES

July 30, 1946

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

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## SOME NURSERY OBSERVATIONS:

Heavy Increase in Nursery Stock. There is every indication that the shortage of nursery stock which existed during the past few years will be corrected in the near future. Everywhere we find nurseries increasing their plantings within the limits of their available labor, including

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skilled budders, and of other essentials. Within three years we may even find an over supply of certain trees particularly peaches. One nursery plans to bud a million peach trees this summer and enough of other fruits to bring the total up to two million. We may even find, within five years, some sizable brush piles of unwanted stock.

Misnamed Trees Much Less Common. While an occasional mixup is almost unavoidable in view of the inexperienced help, the need for getting budwood from a number of sources, etc., it is gratifying to know that most nurseries are keeping a close check on their budding operations and have the rows well labelled. Large scale mixtures, such as the Wolf River-McIntosh deal of a generation ago, are fortunately a thing of the past.

Plums on Peach Roots. It is a common practice among nurserymen to bud some of their plums on peach seedlings instead of plum seedlings for planting in light soils. Such trees are more likely to thrive since the root system of a peach tree seems better adapted to a sandy soil than that of a plum tree.

Japanese Beetles Show Preferences. In certain nurseries where the Japanese Beetle is a menace, as for example in Maryland and Virginia, some fruit trees are heavily attacked while others nearby are quite generally avoided. Sweet cherries and plums are among the favorites and certain varieties seem to be preferred. An occasional tree of apples or peaches in the nursery row may show a large colony of beetles, with 50 or more on a single tree. DDT is being used quite effectively.

A Nursery Oddity. The 5-in-1 tree, so highly praised in the advertisements, is an easy means of getting the amateur's dollar (and then some). But one nurseryman expressed his private opinion that it isn't much of a tree.

Espalier Peach Trees. In one New York nursery, peach trees in considerable numbers are trained by attaching part of the branches to a fan shaped support. A group of Italian women were dexterously preparing these trees for the would-be fruit grower who wants to be different even though he must pay five dollars for the privilege.

Trees Respond to Poultry Manure. In one nursery where trees are making excellent growth it is a common practice to fit the soil by applying a liberal coating of poultry manure sowing soy beans to be plowed under when about knee high. A striking comparison was observed where the supply of poultry manure gave out and one side of the block was left unfertilized. The trees were about a foot shorter in that area.

CORRECTION:

A mistake was made in the title of the first article in June Fruit Notes. It should have read "The Unusual Bloom" instead of the "The Annual Bloom." The writer's scribbling was at fault. His secretary was unable to decipher it, and the stencil didn't get checked before the issue was run off.

## 1946 Apple Crop 3 1/3 Times That of 1945

At the Farm and Home Week Fruit Meeting on July 23, W. E. Piper conducted a survey of apple crop prospects. Fifty-four orchards were reported as follows:

| | 1945 | | 1946 | |
|---|---|---|---|---|
| McIntosh | 56,550 | bu. | 216,065 | bu. |
| Baldwin | 17,909 | " | 57,580 | " |
| Delicious | 3,812 | " | 10,497 | " |
| Total Crop-All Varieties | 104,868 | bu. | 347,035 | bu. |

The McIntosh variety makes up about 62% of the total, Baldwin 6% and Delicious 3%.

## PREMATURE COLORING OF EARLY MCINTOSH APPLES.

In a block of early McIntosh trees in Massachusetts there appeared an alarming change of color of the fruit around July 8. The reddish colored apples were so conspicuous and so numerous as to suggest an ailment which might endanger the entire crop. On closer examination it was obvious that there were both red apples and green apples on the same branch. And when a few apples of each kind were cut to expose the seeds, the red apples were found to have, on the average, fewer seeds than the green apples. This is exactly what one would expect since each seed acts as a little pump in bringing water into the apple. An apple with 8 seeds stands a much better chance of getting its full quota of water than an apple with 4 seeds. And when some of the apples feel the pinch of competition nature has a way of shedding the unfit.

Until the rain of July 22, a severe drought had not only caused lawns to turn brown; it had greatly retarded the growth of apples on dry soils. When the roots are unable to take in enough water to supply the needs of every leaf and apple, they become strong competitors and, strangely enough, the leaf exerts more of a pull than the apple.

In the above mentioned orchard, if all of the reddening apples and at least half of the green apples had been removed, the problem would have been solved. It was simply a case of a large number of apples clamoring for water, and there wasn't enough to go around.

To make matters still worse the trees in this orchard have more branches than they need and the trees are themselves crowded. So it simmers down to a matter of too many apples, too many limbs, and too many trees to permit the development of normal apples in a excessively dry summer. The result is likely to be a large proportion of 2 to 2½ inch apples instead of 2 3/4 to 3 inch.

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Cherry Picking Record. A migrant worker in Hood River, Oregon is reported to have picked 2168 pounds of cherries in a 12-hour day. It gave him a record - also $75.84. Pickers generally average $8 to $14 a day.

WHY EASTERLY WINDS?

(When the air over a large area in the United States becomes heated, there is developed a low pressure area which tends to move toward the east due to the motion of the earth. This often brings an east wind, and rain. Director H. A. Bostrom of the Essex County Agricultural School gave this further explanation of the occurrence of east winds, at a recent twilight meeting.)

"Matters of large economic importance, or having very much bearing upon our personal comfort, sometimes seem to rest upon comparatively insignificant things. Take for example the light easterly winds which seem to dominate the daily climate in the spring and early summer months along our shore. Often we wish there were not so much of it; other times we are exceedingly glad for the light breeze that penetrates, sometimes a mile or two, sometimes a good many miles inland, to prevent what would otherwise be an unbearably hot day.

"When one measures the amount of heat which is required to raise the temperature of the various kinds of materials, one finds that it takes a great deal more heat to warm a unit of water through one unit change of temperature than it does any other of the common substances, such as rock, soil, wood, etc. Said in another way, this means that the temperature of land areas will rise more rapidly from a given amount of the sun's heat than will the temperature over the ocean. Consequently, the air over the land areas warms, expands, and rises more rapidly than it does over large water areas, which creates a movement of the cooler air from over the ocean inward over the land. The difference may be slight, creating only a very light breeze, felt only along the shore, or there may be enough difference to cause the air to move inland a considerable number of miles.

"In weather, no such simple explanation is entirely correct. To quote the Agricultural Yearbook for 1941 (Climate and Man): 'It is more correct to emphasize that the upper layers of the ocean are nearly always in a state of violent stirring, whereby heat losses or heat gains occurring at the sea surface are distributed through the large volumes of water. This mixing process sharply reduces the temperature contrasts between day and night and between winter and summer. In the ground there is no turbulent redistribution of heat and the effect of molecular heat conduction is very slight. Thus violent contrasts between day and night are created (inland)'.

"The writer thus points out that sharper contrasts in temperature are bound to occur over land areas than over the water. The ultimate effect is a sharper, quicker rise in temperature over land area than over the water, resulting in the cooler air from the water moving in towards the warmer inland areas.

"When we as students sat in a class in physics and studied the specific heat of solids, liquids, and gases, most of us found it pretty dry material and we didn't care whether water or iron or stone or some other substance had

the greatest heat capacity. Most of us right now would be glad to feel the breeze that results from such a physical phenomenon. We need more imagination in studying some of the basic scientific principles in the light of their relation to our everyday welfare and comfort!"

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Strawberries Sell At 4¢ A Quart. In a Hartford, Michigan newspaper dated June 13, 1906, there appeared this statement: "Strawberries sold at 60¢ a case (16-quart) Sunday evening with prices climbing to $1.10 a case on the local market last night." Forty years later strawberry growers were paying as much as 10¢ a quart for picking. Incidentally, one New Salem woman picked 150 quarts of Catskills in an 8-hour day and thus earned $15.00.

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RELATION OF 1946 FOLIAGE TO 1947 CROP.

A few days ago a grower raised the question "Shall I apply nitrate of soda now to my McIntosh trees which have practically lost their leaves because of scab?" He had in mind growing a new set of leaves to replace the ones destroyed by scab. His plan would probably fail for at least two reasons. In the first place, the few new leaves which he might induce the tree to grow in late summer would be likely to fare no better than the early leaves as far as scab is concerned, because of the chance of infection from the vast number of scabby leaves now on the tree. And secondly, late summer is no time to stimulate a tree into vigorous, vegetative growth. But the question indicates a growing conviction among fruit growers that leaves are important. And that in itself, means real progress in the fruit business. Without healthy, green leaves until frosts occur in late fall, the tree is not in condition to bear heavy annual crops.

By the magic process known as photosynthesis a normal leaf takes in $CO_2$ through its stomates and welds together the carbon with the hydrogen and oxygen from water, to form starch. This carbohydrate is essential for both vegetative growth and fruit development. In fact, none of the vital processes in a tree can proceed unless there is an ample supply of starch available.

Starch is required to grow new leaves in early spring and to develop the blossoms as well. And as might be expected these spring activities are dependent on the starch manufactured the previous fall. If there were few leaves in September the tree would start out in spring under a tremendous handicap as regards its spring activities. But that isn't all. The fruit buds responsible for the crop must of necessity have had access to growth materials, including starch, from the time they were initiated in mid-summer. One needs only to remove all of the leaves from a tree in July to demonstrate the dependence of the next season's blossoms upon the vital material made in the leaves. The mere differentiation of fruit buds is not enough. They must be nourished during the late summer and fall and provided with stored materials if they are to develop into blossoms the following spring.

What is happening in a tree which is now heavily infected with scab? Its leaves may average less than 10% efficient, and by September even less, because many have dried up or dropped off. The chances of such a tree

blooming next spring are very slim. And if it does bloom lightly there is no assurance that the blossoms will have what it takes to set fruit. But what of the tree in which scab has been partially controlled? It is our guess that the set of fruit in 1947 may be quite closely correlated with the total manufacture of starch between now and late fall. If only a quarter of the leaves are infected, the chances of a full crop in 1947 may be reduced by 25%. Nothing can take the place of large, green leaves. If their efficiency is lowered by any cause whatsoever, the current season's crop and also the next season's crop will suffer.

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Those Reddish Yellow Shrubs. Has your attention been recently attracted to an occasional shrub along the roadside showing typical autumn foliage? Then you were probably looking at a chokecherry infected with X-disease, a serious disease of peaches. Any such shrubs near a present or prospective peach orchard should be destroyed by applying a weed killer such as Ammate.

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DISTRIBUTION OF MASSACHUSETTS APPLES.

Any time a half-dozen, or two dozen, apple growers get together talking shop certain questions always come up. One is "How many McIntosh do we grow in relation to other varieties?" Another is "Where do our apples go; chain stores, commission outlets, jobber-handlers?" Still another is "How many are sold direct either to consumers or retailers?"

Just to get a little information on some of these points a postcard survey was made by asking one hundred growers to cooperate. This group was selected as a representative crosssection of large and small volume producers: spotted all over the State, including the so-called apple areas and the isolated orchardist; those near local markets and those at a distance from consumer areas; in brief, an attempt was made to have the one hundred comprehensively representative of the industry.

Fifty-six returned the card. Not all answered all questions. This group reported total average production of 700,000 bu., so they are fairly representative; that's roughly one-third to one-quarter of the State total.

How does McIntosh compare with other varieties?

Here it is: 62% Mc's vs. 38% all others combined.

No comment is made except to say that is a lot of McIntosh.

The next most interesting point might be that 37 growers said they sold 13% of their crops direct to consumers, and 32 growers sold 16% direct to retailers. Comparing report cards and totaling these two gives a result that these producers dealt directly with consumer outlets on 25% of their volume. Possibly this should be expected in a densely populated area such as Massachusetts but the figure is interesting; perhaps surprising. As many apples sold direct, one way or the other, as were sold on consignment to commission houses. The other 75% went to two outlets; 50% to jobber-handlers and 25% to commission houses.

A must question always in the talk when apple men get together is "How many apples do the 'chains' handle?" Forty-two growers ventured an estimate on this question. These producers were reporting on a total production of 570,000 bu. of which 65,000 went to "direct" sale outlets. Of the other 505,000 the estimate was 49% to chain outlets and 51% to independent outlets.

To summarize:

1. Total production 62% McIntosh, 38% all other varieties.

2. Twenty-five per cent sold direct to consumer or retailer.

3. Fifty per cent sold through jobber-handler; twenty-five per cent through commission outlets.

4. Fifty-one per cent handled by independent stores; forty-nine per cent by "chains."

W. R. Cole

BLOSSOM THINNING SPRAYS.

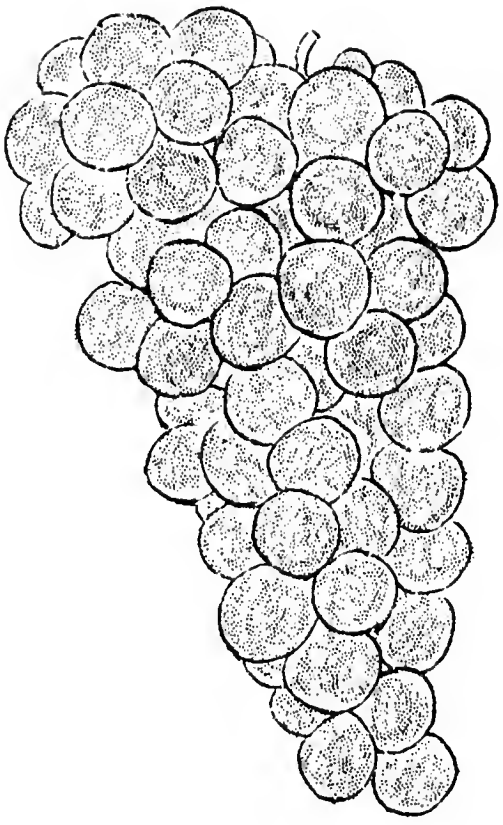
Some further experiments with blossom thinning sprays were made in 1946 and some suggestive results were obtained despite the frosts. While the thinning by frost probably does not invalidate our measure of the effect of the sprays, the cool weather following bloom may make the materials less effective than they would be in a normal season.

Three materials were used. Dowax seemed to have little or no effect in most cases. Two DN powders were used at $\frac{1}{2}$ and 1 lb. per 100 gallons. They burned the leaves much less than Elgetol used two years ago and thinned most varieties quite effectively. They were not effective on McIntosh and some similar varieties.

A napthalene acetic acid preparation thinned some varieties but caused some distortion of the leaves. Whether this will be injurious remains to be seen. A biennial bearing Wealthy sprayed last year has a fair crop in this, the normally non-bearing year.

These sprays are still in the experimental stage. The effect differs with variety, some requiring a stronger concentration than others. It is a promising method of helping out with the laborious job of thinning. Any grower desiring to gain experience may write us and we will be glad to make suggestions and help him learn how to use these sprays effectively.

J. K. Shaw



# FRUIT NOTES

August 30, 1946

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## DOORYARD DWARF APPLE TREES

Few commercial fruit growers have planted dwarf apple trees but there is a great demand from amateurs. Nurserymen are selling many such trees at what seems to the fruit grower to be very high prices. Most of these buyers expect a truly dwarf tree which will never be more than 6 or 8 feet high. Many of them are going to be disappointed. Nurserymen are not sufficiently discriminating in their use of dwarfing stocks. The only stock now in use that will produce a 6-8 foot tree is Malling IX. There are other Malling stocks which have a dwarfing effect but not to the same degree as Malling IX. They are all right if one has room enough for them but they need a spacing of 20-30 feet according to variety and stock. Other than Malling stocks have little or no dwarfing influence.

Fruit growers are often called on for advice by their town friends. If these folks want truly dwarf apple trees, they should insist on getting

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trees on Malling IX. Another possible disappointment with dwarf trees is rooting from the scion. If earth surrounds the tree above the bud union, rooting from the scion will surely occur and the dwarfing effect of the stock will be lost. There is going to be a lot of disappointment with dwarf trees and a good deal of it will arise from the use of improper stocks. It is going to be a big job to keep dwarf stocks true-to-name. They can be identified before budding but after the tree grows it is impossible to be sure in all cases. The Massachusetts Trueness-to-name Inspection Service is trying to do what it can to keep the Malling stocks correct, but it is a difficult task.

J. K. Shaw

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Unveiling a "Dwarf Tree". A bit of unrehearsed comedy was enacted in Worcester last spring. Two business men who live on adjacent properties decided to make a joint purchase of a dwarf apple tree to be planted on the line separating their gardens. With due ceremony they dug a large hole, filled it with loam and carried their well wrapped bundle to the scene of action while their wives looked on with pride. When the wrappings were removed the prospective orchardists gazed with dismay on -- of all things, a Forsythia bush! To make matters worse, one of the men had been trying for two years to rid his property of a tangled growth of that same kind of plant.

Two Observations in a Granville Orchard. In the fall of 1944, 100 apple maggot pupae were placed in the soil beneath a screened cage in the orchard of Ralph Roberts in Granville. Mr. Roberts kept watch of the emergence of flies during the summer of 1945. When we visited the orchard a few days ago we decided to take a look at the cage which had remained undisturbed. No pupae had been planted there in the fall of 1945. To our surprise we found one maggot fly, which bears out the contention of investigators that an occasional pupa remains in the ground two winters before emerging as a fly.

The effect of a good pollenizer on the set of McIntosh was strikingly illustrated in this same orchard. In one block there are several rows of McIntosh and a single tree of Delicious. The McIntosh trees immediately adjacent to the Delicious have a very heavy set of apples. On the trees a little farther from the Delicious the set is much lighter and becomes increasingly so on the more distant trees. Here is an object lesson more convincing than anything we might say about the importance of nearby pollenizers.

# Do You Know:

That the U. S. normally buys about half of the world supply of bananas? In 1937 we imported 63,000,000 bunches and in 1943 only 22,000,000 bunches. It will take some time to restore the banana plantations, shipping, and upset conditions in the big banana producing countries. In normal times, bananas are considered the most important fruit in world trade.

That approximately one ton of mulberry leaves is consumed in the production of one pound of silk? More than 25,000 cocoons are involved.

That fall set strawberry plants are unlikely to thrive unless well mulched? Fall planting has one big advantage over late spring planting, in that the roots become established in time to encourage early runner plants the next spring. The principal disadvantage is that the bed must be mulched twice for one crop of berries, and the first mulch must be raked off the following spring to permit the development of runner plants.

That there has been a seven-fold increase in the canning of citrus fruits in the past nine years? During this period there has been slightly less than a three-fold increase in the total citrus crop. Nine years ago a little less than one-third of the grapefruit grown in Florida was processed and now two-thirds of the crop goes to the canneries. During the same period, processing of oranges has increased from about one-seventieth to one-fourth of the total crop.

That about 14,000,000 pounds of lead arsenate are used annually to protect the apple crop in the State of Washington? This is approximately one-fifth of the 75,000,000 pounds estimated to be needed for the entire United States.

That bagging of quinces offers excellent possibilities as a means of preventing pest blemishes? One Pennsylvania grower reports using 1000 2-pound grape bags to protect the fruit on two trees. Last year his quinces brought $70,00. One quince weighed 16 ounces.

That the Oriental fruit moth is now quite generally distributed over the United States? It is said that every state except North Dakota either has the pest or is bordered by another state which is infested.

That fig trees were first grown in the United States in 1882 when 14,000 cuttings of Smyrna figs were imported into California? However, no figs developed and it was not until several years later that investigators revealed the secret. Wild figs and a tiny wasp were needed to bring about the pollination of the cultivated fig blossom.

That it takes more than five times as many 2-inch peaches to make a ton as it does 3½ inch peaches? One hundred of the latter size weigh as much as 535 of the former size.

That the value of all fruits grown in Massachusetts is about one-third the total for New England? The percentages for the six states of the approximately $16,000,000 fruit valuation are as follows: Mass., 33.5%; Conn., 26.4%; Maine, 25.1%; Vt., 6.3%; N. H., 5.5%; R. I., 3.2%. (Cranberries are not included in these figures. The Mass. crop in 1945 was valued at $8,460,000.)

That the largest source of Nitrogen in the world is the atmosphere? It is estimated that over every square mile of the earth's surface there are 22,000,000 tons of this element. Nitrogen is known as the growth element in fertilizers. Without fertilizers containing nitrogen and other essential elements, American farmers would have to plant, cultivate, and harvest 50,000,000 additional acres of land to obtain today's food crops.

That there was practically no change in the numbers of bearing and non-bearing apple trees in New York State during the five year period, 1940-1945? During the same period there was a 10% decline in peach trees and a 10% increase in cherry trees.

That the August estimate of the apple crop in the U. S. is 111,728,000 bushels? This is 64% more than last year's record low crop and 8% below the 1935 -44 average.

That spur blight and anthracnose are limiting factors in many raspberry plantings in Massachusetts? Striking results have been obtained this season in the control of these diseases from applications of fermate after the new canes attain a height of 10 or 12 inches.

That four tons per acre is not an unreasonable yield of grapes in a commercial vineyard? In the vineyards around Lake Erie the average yield is said to be approximately 1½ tons, while individual growers who use commercial fertilizers annually and manure every four or five years, harvest 3½ to 4 tons per acre. Similar yields are reported in other vineyards in the Northeast.

That beehives in the orchard should be placed where the sun will shine on them and with entrances toward the east or south? The heat from the sun and the additional sunlight induce the bees to fly and work on the blossoms at times when colonies in the shade will not be active.

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An Echo of 1916. Imagine a fruit grower ordering 500 McIntosh apple trees only to find when they came into bearing that 494 of them were Wolf River! That was the experience of a Massachusetts grower about 30 years ago. Fortunately, such gross mixtures are a thing of the past in many nurseries, thanks to the inspection service which has been in operation since 1921.

FRUIT CRACKING

Numerous reports have been received concerning the splitting or cracking of apples, particularly Early McIntosh, this season. Other fruits, and even certain kinds of squash show a similar tendency. "Why is cracking more prevalent this season than normally?" The condition seems to be associated with rainfall. We had plenty of rainfall during May and June, but the first three weeks of July were very dry. Fruits which had been expanding rapidly experienced a slower rate of growth in July, until the very heavy rain which came in the Connecticut Valley on July 23, and was followed by additional rains during late July and August.

When the growth of an apple or other fruit is checked, there is a tendency for the cells in the skin to become more or less fixed. They lose their ability to subdivide and thus provide for further expansion. This lack of flexibility means that something must give way when swelling is resumed in response to an additional intake of water. It's a little like a balloon. Everything is O. K. so long as the protective membrane can adjust itself to pressure from within. And when the membrane gives way, something happens. The splitting of an apple is less violent for obvious reasons. A mere rupture here and there permits an increase in diameter even though it is literally "hidebound".

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HIGH HONOR FOR MASSACHUSETTS FRUIT GROWER

A few weeks ago John Chandler of Sterling Junction, received the first of what is to be annual awards by the National Apple Institute for meritorious service to the industry. At a meeting of the Institute in Washington, Mr. Chandler was presented with a gold watch and a scroll inscribed as follows: "In esteem and appreciation for distinctive service to the Apple Industry of America, and to the discharge of his responsibilities in wartime, John Chandler is presented the National Apple Institute award for 1946." This selection of Mr. Chandler for such distinguished honors in in recognition of the fine work which he did during practically the entire period of war emergencies. During that time he has been in close touch with affairs in the Nation's Capitol and has travelled extensively throughout the country as a representative of the commercial apple industry.

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Dwarfs and Giants. The necessity for planting dwarf fruit trees in such a way that the graft or bud union is slightly above the ground level is well illustrated in the garden of an observing grower in Amherst. The base of the trunk on one of his trees was buried with soil during a particular season, from May until October, at which time the soil was removed. During those five months a new root 18 inches in length had developed from a point above the union. It is no wonder that dwarf trees, if planted too deeply, suddenly take on the characteristics of a standard tree.

RODENT CONTROL IN STORAGE AND ORCHARD.

(F. B. Schuler of the Fish and Wildlife Service offers these timely suggestions on the prevention of rodent damage.)

Fruit growers should be aware of the possible damage to stored fruit by rats and mice. Every fall there are reports of excessive damage to fruit held in common and cold storage. On many farms the reported loss is as high as ten bushels for every thousand stored. This loss can be prevented.

Common Storage. Common Storage is more open to attack by rodents than fruit held in cold storage, since the former is usually an open building used temporarily for holding the surplus crop. The following recommendations are made for a rodent-free storage: 1. Remove all trash from the building and the vicinity of the proposed storage area. 2. Stack usable lumber at least one foot above the ground level. 3. Burn the waste accumulated from this operation. Since rats and mice are wary animals, the lack of shelter or concealment discourages their presence. Therefore, plug with concrete, or shield with galvanized sheet metal or 4 x 4 hardware cloth all openings in foundation walls, floor or embankments. Where a rat colony already exists, extermination must take place before harvest. Write to your County Agricultural Agent for information on control methods.

When the fruit is harvested it should be stacked at least six inches from the walls, on wooden slats at least two inches above the floor. This will allow for proper ventilation and is also of assistance in controlling the rats and mice. The area along the walls and the free space under the boxes can then be utilized for the distribution of strychnine-treated steam-crushed oats. The oats should be scattered in tablespoonful amounts in these areas as the storage room is being filled. Bait stations made from mailing tubes, hollow tile, rolled tarpaper or similar devices should be inserted throughout the stacked boxes above ground level. A tablespoonful of the treated grain in each station will be adequate.

Cold Storage. The rodent problem in cold storage usually results from the mice being carried into the storage with the fruit. Whenever practicable the fruit should be moved into the storage the same day it is picked. If allowed to stand in the orchard during the night, mice will use the boxes for shelter and be carried into the storage. Occasionally a cold storage is found that is not mouse proof. Check all drains and vents to be sure they are screened. Hardware cloth with four wires to the inch should be used to mouse proof these openings. In some cases pipe inlets, electrical conduits, offer an indirect means of entrance to the storage. Where they are accessible to the mice they should be checked to see that the exterior of the building is tight. The distribution and placement of strychnine-treated oats should be followed as outlined above. The important thing is to expose the bait while filling the storage. The strychnine-treated steam-crushed oats may be procured through your County Agricultural Agent.

Orchard Practices. Fruit trees are girdled in all months of the year. The practice of keeping tree bases free of vegetation is a worthwhile precautionary measure. Removal of the sod around the tree bases reduces the mouse

cover, lessening the chances of girdling during the present growing season, and also, during the snow-free periods of winter and early spring. The use of this method is highly recommended in young blocks of trees, or where the trees are widely spaced, with the resulting heavy cover crop.

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CANNERY GRADES

For the first time in history, so far as we can discover, cannery grades of apples are being bought by at least one Massachusetts concern. This provides an outlet for fruit which is not quite good enough to be offered on the fresh fruit market. The principal requirements for these grades are as follows:

U. S. #1 Canners Handpicked apples, 2½" and larger, reasonably round, not overripe, free from decay, worm holes, freezing injury, internal breakdown, and from any defect which cannot be removed during the usual commercial preparation for use without causing a loss of over 5%, by weight, of the apple in excess of that which would occur if the apple were perfect. Color not essential. Light surface scab not harmful.

U.S. #2 Canners Dropped apples and culls from handpicked apples, any size, firm ripe, not overripe, free from decay, freezing injury, excessive internal breakdown and from any defect which cannot be removed during the usual commercial preparation for use without causing a loss of over 25%, by weight, of the apple in excess of that which would occur if the apple were perfect.

One reason why the first mentioned grade is worth about 50% more than the latter is the larger size which makes it possible to peel, core, and trim with less waste. In fact, the latter grade apples are used for apple juice. The following table taken from a recent Apple Institute release brings out the relation between size and waste in preparation:

| 100 lbs. of apples by size | Net yield after peeling coring and trimming |
|---|---|
| 2 1/4" | 53 lbs. |
| 2 1/2" | 66 " |
| 2 3/4" | 73 " |
| 3" | 78 " |

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THE "DROP" QUESTION

Not so many years ago it was a common practice to begin harvesting McIntosh apples around Sept. 12 to 15. Today we find the harvest in full swing around September 8 to 10 and in some orchards a start is made as early as September 5. The principal reasons for advancing the date of harvest seem to be (1) a desire to get the apples picked before they drop, on the theory that a green, unbruised apple is worth more than a red, bruised

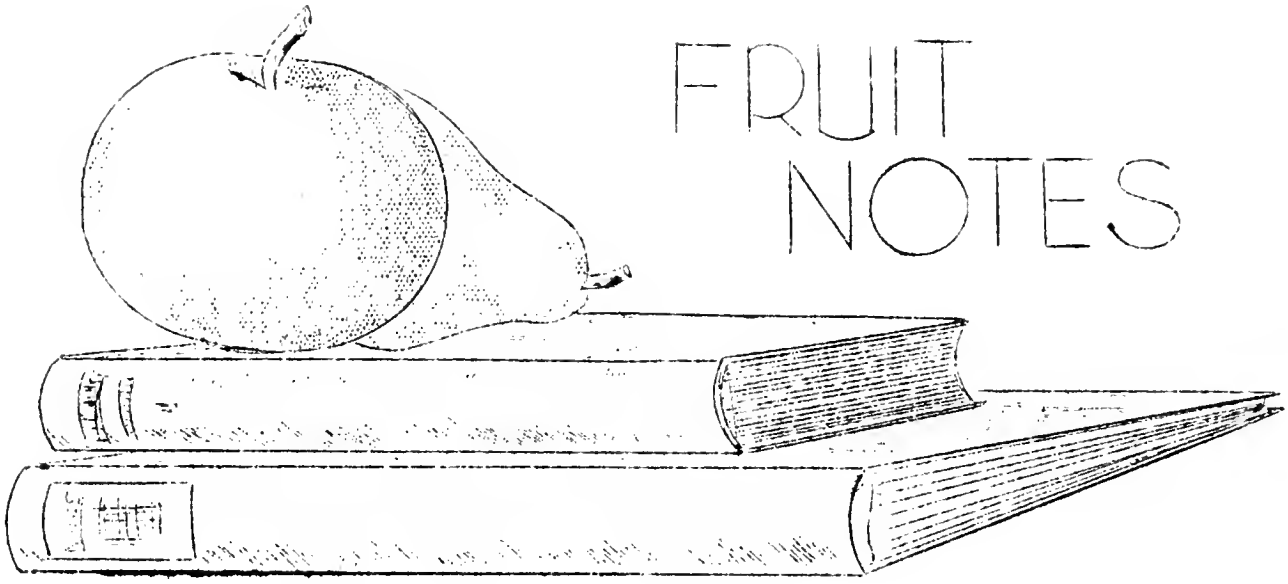
one, and (2) a shortage of pickers which necessitates a lengthening the picking season. Both of these points are debatable. In fact, they seem to approach the problem from the wrong angle.

In the first place, an excessive premature drop is one of the symptoms of magnesium deficiency. And a shortage of that element can never be supplied by advancing the date of harvest. The McIntosh variety appears to be very sensitive to deficiencies of certain essential elements. If boron is lacking, internal cork appears. If magnesium is lacking, the fruit drops with alarming suddenness, and under such conditions no response to the hormone, naphthalene acetic acid, may be expected. Only as the magnesium balance is restored can we produce high colored, high quality McIntosh. And only then will the hormone be effective in holding the apples on the tree beyond the normal date of harvest.

Every observing grower knows that apples size up rapidly during September unless the soil is unusually dry. An apple may gain a quarter of an inch in diameter during a two weeks period, and that means many extra bushels in a ten acre orchard. Thus if the better colored apples are picked first, the remaining apples will increase in size and become better colored. And even if a few apples drop in the meantime, the drop apples will sell at a fair price while those which remain will gain in value more than enough to offset the bruised condition of the drops. Then too, if the tree is well mulched, high colored drops will command a better price than green, poor quality apples picked from the tree.

The drop question should be considered on a percentage basis. It isn't so much the number of drops under a tree as it is the percentage of the whole crop. A bushel of drops under a single tree might seem to be excessive. But if the tree has a crop of 20 bushels, the drops make up only 5%, and that's very reasonable. And while some apples have dropped, those on the tree have been developing the kind of color and flavor upon which the McIntosh reputation is based. If the truth were known their added size might easily offset the bushel which appears to be lost as drops.

Any McIntosh grower interested in getting maximum color and quality ought not to overlook the possibilities of using the hormone material as a means of holding the apples on the tree assuming, of course, that no magnesium deficiency exists. The secret of success in applying the hormone spray or dust seems to depend upon getting it on at just the right time, covering the tree thoroughly and under the right weather conditions. It requires about 24 hours for the hormone to take effect and, on McIntosh, the effect tends to wear off in about 8 or 10 days. And since the material is absorbed through the stem, a heavy application is needed to make sure that every stem is covered. The temperature is also important. Better results are likely to follow an application made around noon of a warm day than one made in the morning or evening. One of the real values of the preharvest application is in extending the picking season. By treating half of the orchard just before a normal drop occurs, those apples may be harvested a week later than the rest of the orchard and with greatly improved color, size and quality.




September 30, 1946

Prepared by the Fruit Program Committee of the Extension Service
W. H. Thies, Extension Horticulturist

Contents



## SOIL CONSERVATION IN THE NURSERY

One of the prerequisites in growing strong and healthy nursery stock is a rich and fertile soil which has a plentiful supply of moisture. This point is clearly demonstrated by a nurseryman in northern Alabama. He has been growing all of his nursery stock by the contour system of planting for several years and wishes he had adopted the practice before. He is firmly convinced that he is able to grow better trees with this system of planting than under the old conventional square system. At the time we visited this nursery in late summer it had not rained for several weeks and crops

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were beginning to show the effects of insufficient moisture, yet the trees which were planted on the contour were continuing to make new growth and showed no signs of lacking water. Soil conservation in this section of the South has taken hold in a big way, but it is a case of taking care of the soil or having no soil at all.

Some of the finest trees which we saw were grown on land which had been heavily manured. It is a common practice for many nurserymen, both in the South and the North, to raise beef cattle, not for the beef but primarily for the manure which is put on their nursery land. The most vigorous and healthy nursery stock is almost always found in the nurseries which raise beef cattle. A plentiful supply of organic matter appears to be a big factor in growing good nursery stock. If this is what it takes to grow a young tree in the nursery why not give the tree you set in your orchard the same chance it had before it left its happy home?

W. D. Weeks

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## AN OBSERVATION OF PLANT NUTRITION

In an orchard in Bristol County there is a McIntosh tree which gives an excellent demonstration of one of the principles of plant physiology that there is no cross transfer of mineral nutrients in a tree. This tree is growing near a fence. Across the fence on a neighbor's property, 15 or 20 feet from the tree, is a pile of poultry manure. On the side of the tree toward the manure pile the leaves were dark green, terminal growth was excellent, and the crop was good. On the side away from the manure pile the leaves were lighter green, terminal growth was shorter, and the crop light. In late August, when this tree was seen, there was no visible evidence of any reduction in color on the high nitrogen side of the tree. This observation suggests also that fertilizer applied beyond the spread of the branches may not all be lost because the roots will grow to considerable distances to obtain the nutrients the tree needs.

J. S. Bailey

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## THEN AND NOW IN THE FRUIT BUSINESS

The long time nature of most fruit enterprises suggests a permanence not found in certain other enterprises including vegetables or poultry. An apple tree or a grape vine may continue to bear fruit over a period of 100 years. In fact they are so long lived that some growers think of a fruit planting as an unchanging thing which may be handed down from father

to son. Nothing could be farther from the truth. A few examples will illustrate this point.

Let us consider first some of the changes in fruit varieties. In 1914, a fruit authority included the Hubbardston and the Blue Pearmain apples among the varieties well suited to planting in Massachusetts. Today these varieties are practically a thing of the past. In 1925, about 25% of our commercial apple crop was of the McIntosh variety and about 40% were Baldwins. By 1940, these percentages were just about reversed. Today at least 60% of the commercial crop is of the McIntosh variety. The pendulum has probably swung far enough, and we now find growers thinking in terms of other varieties instead of planting a still larger percentage of McIntosh.

Of the recommended peach varieties 25 years ago, only two remain today, Elberta and J. H. Hale. The Howard 17 strawberry which was grown almost exclusively for many years is gradually being replaced by the Catskill. These two varieties are about equally prominent today. When the "New England Seven" list of varieties was prepared in 1928, the Cortland was not included. Today there is no question as to its place in comparison with, for example, the Wealthy and Rhode Island Greenings both of which were included in the 1928 list.

In 1916, the above mentioned authority advised every commercial apple grower to provide himself with a good barrel sprayer. But the barrel sprayer has given away to the power sprayer which in turn is being constantly improved. We have seen a wide variety of spray nozzles including the single disc nozzle, spray gun, triplex, quad, spray broom, etc. And today many of the larger orchards are equipped with a so-called speed sprayer. Furthermore, most large orchards find it necessary to use both a sprayer and a duster. Things are changing rapidly in the field of pest control equipment.

Along with improved equipment, very radical changes are taking place in insecticides and fungicides. The much publicized material, DDT, is very effective against codling moth; Oriental fruit moth, leaf hopper, tarnished plant bug, etc. But it is not a panacea for all insect problems.

In 1920, many growers were wondering because of heavy scab infections, if we would ever be able to grow McIntosh apples successfully. (Some have been wondering about the same thing in 1946). Sulfur in its many forms, including lime sulfur, dry-mix sulfur lime, wettable sulfur, sulfur dust, etc. has been the main stay in preventing scab infections for many years. Today, however, fermate, Puratized, and other promising materials are beginning to replace sulfur. Now for the first time we have in fermate a promising control for the rust diseaseas of apples as well as a means of avoiding so much russetting of Delicious and Baldwin. In Elgetol, we have a material which may be applied on the ground in early spring to reduce the danger of heavy scab infection. Yes, rapid advancement is being made in the control of fruit pests.

Other equally revolutionary changes are taking place in orchard soil management. Five years ago, magnesium deficiency symptoms in apple trees were practically unrecognized. The characteristic leaf scorch was attributed to spray injury or to dry weather. Today, we recognize this particular type of leaf scorch along with an early dropping of leaves and fruit as due to a shortage of the element magnesium. Applications of high magnesium lime and of magnesium sulfate (Epsom salts) in fruit plantings are becoming increasingly common.

The use of the bulldozer and the power shovel in the removal of old, unwanted trees, boulders, stonewalls,etc. marks a real step in the direction of more efficient orchard management. Stone walls are being buried, old trees pushed out of the way and the orchard floor smoothed up through the removal of boulders. These practices will reduce production costs and will greatly facilitate the spray program. Contour planting of orchards is becoming more common. A selection of a good soil and a frost free location are assuming much more importance than they did in the past. We are also beginning to appreciate the value of organic matter in the soil and the necessity for bringing in additional mulch where trees are planted on lighter soils.

Ten years ago it was a common practice to place mouse bait in bait stations, bottles or other containers. Today we know that it is much more effective to place the bait directly in the "run", and instead of relying entirely upon strychnine baits we are using zinc phosphide very effectively. The use of napthalene acetic acid to prevent preharvest dropping of McIntosh has become an established practice. Many growers apply this material in a part of the orchard to extend the picking season. In some cases two applications are made to good advantage. There is now in prospect a very effective means of preventing storage scald through the use of solid carbon dioxide. The cause and prevention of storage scald is receiving attention in several experiment stations and control measures are being carefully worked out.

Other signs of change in the fruit business include: a trend toward consumer packages and the utilization of low grade fruits in by-products instead of placing them on the retail market. High grade apple juice is replacing "cider" (with its none too good a reputation). Methods of "firming" McIntosh apples for use in pies have been worked out.

The forgoing examples by no means exhaust the list of changes in the fruit business. They do suggest, however, that the growing and marketing of fruits are undergoing vast changes. Any grower who neglects to read of new developments, to observe what is taking place in other fruit enterprises, and who is content to do things as they were done in grandfather's day, will find it increasingly difficult to compete in the fruit market. We are still picking fruit by hand as was done in Grandfather's day but many other things are being done by new and improved methods. Still better things are just around the corner.

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SIMPLIFYING TECHNICAL MATERIAL

If technical statements sometimes appear in Fruit Notes, without simplification, that policy finds real support in a recent article under the heading "Mania for Simplicity" by F. L. Thomsen of the Bureau of Agricultural Economics. Quoting from the September 16 issue of USDA: "There are people who hold that everything must be briefed, abstracted, digested, sugar-coated, and so expressed that pictograms and a few words of one syllable will tell the entire complex story. There are even digests of the digests now, but some stories that should be told, and written, and heard, and read, cannot be expressed in baby talk so that busy people - who have plenty of time for highly technical discussion of sports or hobbies - can absorb and understand painlessly. There is a limit to that sort of thing. There seems to be a point at which people should be educated up to understanding, and where the effort to simplify should taper off".

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Spur Blight and Anthracnose of Raspberries. These diseases are responsible for heavy losses in raspberry plantings in Massachusetts. They may be controlled very effectively by a recently discovered and thoroughly tested treatment. Full details are included in a mimeographed leaflet prepared by O. C. Boyd, Clark Hall, Massachusetts State College. A copy will be mailed on request.

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NOTES ON MEADOW MICE (Prepared by Carl B. Henry, Principal Mammal Control Agent of the Fish and Wildlife Service in Massachusetts.)

One of the annual fall problems which confront the orchardist is that of controlling the meadow mouse. Meadow mice can be controlled successfully only when the work is done thoroughly, by competent help and under careful supervision.

Meadow mice are prolific and under favorable conditions produce several litters of young a year. In favorable "mouse years" there are eight to ten litters a year, while in years of scarcity, only five to six litters. Litter size fluctuates; large litters predominate when mice are becoming abundant. The number of young in a litter varies from one to eleven, the average being five. The mice usually reach sexual maturity when five to six weeks of age.

Meadow mice are active throughout the year and will damage trees of all sizes both above and below the ground level. Damage has been noted in every month of the year. Meadow mice do not like to come out in the open. For this reason, keeping a grass free area of twelve to eighteen inches around tree base is a worthwhile procedure and offers some protection during periods when no snow is on the ground.

The orchard floor is important in meadow mouse control. The smoother the orchard floor, the less ridges, ruts, harrow marks, holes left by tree removal, stonewalls and brush rows, the easier it is to control mice.

To determine the degree of mouse infestation in your orchard, follow those simple practices.

(1) When mowing late in the summer watch for evidence of mice.

(2) While gathering windfall apples note areas in the orchard where most apples are nibbled.

(3) If hawks are seen circling over orchard, skunk and fox digging are noticed or cats are observed catching mice, look for evidence of the presence of these rodents.

(4) The tree-girdling mice are the only real trail builders; therefore, search for their runways under hay mulch and in rank vegetation.

(5) Also learn to detect active runways by noting fresh grass clippings, empty seed hulls, nibbled windfalls and fresh excreta.

Co-operators of the Fish and Wildlife Service have established a bait mixing station at Amherst, Massachusetts to facilitate the preparation and distribution of poison bait for use in controlling mice. Information on how to procure these baits can be obtained from your County Agents.

Fresh apple cubes one half inch or larger treated with zinc phosphide placed in active runways immediately after windfalls are picked up will give excellent results when thoroughly and properly applied. One such treatment yearly should be sufficient. Stonewalls, brush rows, stone drains should be re-treated before snow falls. The broadcasting of poison baits is not recommended, not only because of the poor results obtained in the control of mice but also, because of the danger to other wild life. While mouse-signs in the orchards this year may not be as easily seen as last year, no grower should omit this work from his orchard program or permit it to be done haphazardly. A job worth doing is worth doing well.

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## CONTROL OF ODORS IN FRUIT STORAGES

(The following suggestions from Dr. Smock of Cornell University are particularly timely at this season when apples are being stored in all sorts of storages, good, bad and indifferent.)

Stored fruits absorb odors very readily. Apples have been discounted in price in late spring because they had absorbed foul odors in storage. These absorbed odors do not leave the apples very readily even after they have been removed from storage. For example, one lot of applesauce had to be destroyed because the apples used in its manufacture had been stored with potatoes.

There are many sources of foul odors which may contaminate fruit in storage. Sometimes building materials are the source of odors. Occasionally other foods stored with the fruit are the source of trouble. Potatoes

cabbage, or onions are potential odor producing materials that may cause off flavor in apples when stored together. Sometimes surface molds growing in the storage produce strong musty odors which are absorbed by fruit.

Only odor free material should be used in the construction of fruit storages. Certain of the odors emanating from construction materials can be removed by proper air purification methods, but adds more expense to storage. Although surface molds can be controlled by keeping the relative humidity in storages below 80%, it hardly constitutes a good method of control because the apples will shrivel during extended storage at such a low humidity. The control of surface molds at high humidities is possible by the use of ozone. Because of the expense and the unreliability of ozone generators, however, control of molds with ozone has not been very widely adopted.

Store Crops Separately. For best results, apples should not be stored with other foods which have a strong odor. In addition to having different storage requirements than the apple, the odors from these foods may be taken up by the apples.

When an odor problem does exist it can often be eliminated by air purification. Many odors can be successfully removed from the storage by passing the air through beds of activated charcoal, made from coconut shells. While this method of control is relatively new it has been demonstrated to have considerable merit in several tests. Success with this technique involves good air circulation throughout the whole storage chamber so that the atmosphere of the entire room is purified.

To be perfectly safe, apples should be stored alone in clean, odor free storages at the recommended temperature and humidity. This is the cheapest and most certain means of assuring satisfactory quality when the fruit is removed from storage for sale.

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Supports for Grape Vines. Grape growers interested in a source of cedar posts or stakes for making trellises may obtain some information by contacting the writer. A large supply "in varying lengths and sizes at attractive prices" is said to be available.

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Only 6 Sprays. A Middlesex County grower has succeeded in bringing through a very creditable crop of McIntosh this season and has applied only six sprays. A wettable sulfur was used four times and lime sulfur twice, plus lead arsenate and lime in all but one, the blossom spray.

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"No Pincha da Peach" To satisfy public curiosity, someone has suggested displaying a coconut on a fruitstand with this placard, - "No pincha da peach; pincha da coke". Not a bad idea.

# Do You Know:



That the date palm is one of more than 1200 species of palms and at present is the only species under commercial cultivation? For more than 4000 years the date has been a valuable food for people in the valleys of the Tigris and Euphrates Rivers in southern Asia. To the ancient Egyptians, the date palm was a sign of the presence of water.

That some excellent suggestions on storage construction are presented in the September issue of the American Fruit Grower? It contains three storage articles, - "Remodeling Old Buildings for Cold Storage Units", "If You Plan to Build a Cold Storage", and "Rat Control in Cold Storage".

That information on DDT Residue Tolerance has been published in a recent bulletin by the National Apple Institute? Investigations of several cases of human illness attributed to DDT have shown the original diagnosis to be erroneous.

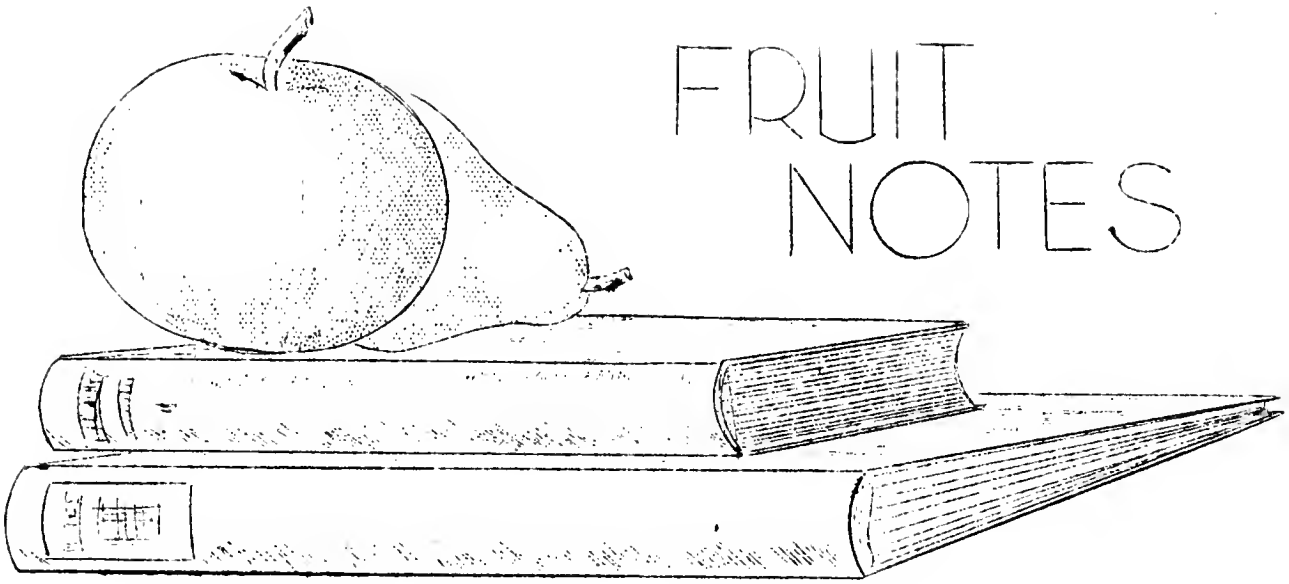
That there are as many as 11 generations of some species of aphids in a single season! Many species produce from 50 to 100 young per generation. On the basis of 10 survivors per generation, one aphid could have 1000 decendants by the 4th generation. No wonder they seem to take possession of a plant while one's back is turned.

That "goop", a magnesium dust mixed with asphalt and tar which was used in incendiary bombs in wartime, may prove useful in the orchard? At Michigan State College it kept piles of orchard brush burning briskly. Goop has a consistency like clay and may find a place in orchard heating.

That orchard reorganization is one of the most pressing needs on most fruit farms? Relieving crowded conditions, introducing pollinizers, catching up on long delayed pruning, getting rid of stones and planting a new block to replace an old one are some of the items which deserve something more than wishful thinking.

That the so-called Milky Disease offers promise in the control of Japanese Beetle? The disease involves a spore forming bacterium and the normal invasion route is via the alimentary canal of the host. Both the vegetative and the spore forms seem to be infective. Grubs acquire the disease by ingesting spores along with their food. Disintegration of diseased grubs, after death, liberates spores in the soil. The number of spores produced per grub approximates 2,000,000,000.

That color and quality of apples are likely to be poorer where the leaves are heavily infested with red mite? Quoting from Storrs Horticultural Notes, "The bright, dry weather of late August and September has favored an unusually heavy red mite build-up. McIntosh, Delicious and Baldwin are most seriously affected. If bronzed noticeably by mite at present, apples may drop excessively and early with poorer color. Also, hormone materials applied to bronzed foliage cannot be expected to be as effective as applied on clean, green leaves".



# FRUIT NOTES

October 30, 1946

Prepared by the Fruit Program Committee of the Extension Service
W. H. Thies, Extension Horticulturist

Contents



## PROS AND CONS OF FALL PLANTING OF NURSERY STOCK

The supposed benefits of fall planting are: (1) The tree has a chance to develop an extensive root system before growth is stopped by cold weather. (2) This root system is better able to supply the leaves which develop in the spring with water and nutrients. (3) The tree will make more growth and be larger at the end of the first growing season. Some advocates of fall planting claim that they are able to gain one year's growth over spring planting.

Successful fall planting is dependent upon (1) ability to obtain trees which are properly matured, (2) a period of several weeks of mild weather after the trees are planted, which will give the tree a chance to make enough root growth to become firmly established before the soil freezes, and (3) a comparatively mild winter. Unless these conditions are met the chances of

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A.Munson, Director, Massachusetts State College, United States Department of Agriculture and County Extension Service cooperating.

fall planted trees living are pretty slim.

The biggest drawback to fall planting here in Massachusetts is that the season is too short between the time we can obtain properly matured nursery stock and the time severe cold weather arrives. With the soil frozen, very little root growth can take place and the newly planted tree has very little chance to get its root system firmly established. Such a tree is likely to be killed during the winter by cold dry winds or it may be heaved right out of the ground by frost action in the spring. Occasionally we have a mild fall and winter when fall planted trees will come through the winter without injury, but the current prices and shortages of nursery stock do not allow the fruit grower to take such a risk.

Trees planted early in the spring, just as soon as one can get on the ground, will make growth comparable to that of fall planted trees.

W. D. Weeks

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## Fruit Meetings - Worcester - January 7, 8, and 9, 1947

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### APPLE ORCHARD EXPANSION. WHY? WHEN? WHERE? WHAT? WHO?

To one who has watched the apple business for more than 40 years it appears that this country has, in general, produced about as many apples as could be sold at a profit. In some years the crop has been short and the price high; in other years more have been grown than the market could well absorb and prices have been low. The number of trees has tended to decrease but tree yields have increased. This seems to indicate that no material increase of orchard trees is warranted. Yet trees grow old and unprofitable and must be replaced if production is to be maintained. This is particularly true in Massachusetts. Most of our orchards are more than 20 years old and at about 40 years trees are likely to pass into the unprofitable stage. This suggests that more trees must be planted within the next few years if profitable production is to be maintained. If we expand production here it must be at the expense of other apple regions. Our best growers can compete with any others but less skillful and less lucky ones are at a disadvantage.

The last three years have emphasized the importance of sites with good air drainage and we know something of the importance of good soils. It is and always will be foolish to plant orchards on poor sites and soils. The importance of a well organized, efficient orchard organization is not fully understood. Some growers can expand their business without a proportionate increase in unit cost and thus obtain more profit. Perhaps most growers should plant with the expectation of removing an equal number of old trees as the new trees come into production.

The McIntosh is, and, until a better variety appears, will continue to be our most important variety. But we need other varieties for polli-

nation and to extend the harvesting and marketing season. What varieties shall we plant? No definite answer can be given. Cortland is second in importance; the Baldwin is apparently going out. One of the most promising replacements is the comparatively new variety, Davey (Davenport 25). It is equal to Baldwin in all respects except that it wilts unless stored in rather high humidity. The tree is hardier, more productive and crops at an earlier age. Whether it will do well under a wide range of conditions is not yet known. If trees were available it would be worth an extended trial. Golden Delicious should overcome the prejudice against yellow apples but our season is a little too short and cool to allow best development, and an immature Golden Delicious is practically worthless. It should be planted only where early maturity may be expected. Rome Beauty now interests some growers. It is a cheap apple. It sells at a rather low price but it can be grown, at a lower cost. As with other varieties, one of the red forms such as Gallia is probably better than the true Rome. The red sports, when available, are steadily replacing the old, less well colored varieties. Varieties earlier than McIntosh should be planted only in small proportion. When McIntosh comes into market, earlier varieties are at a disadvantage. We may soon have too many Early McIntosh.

To sum up - no great expansion of the apple business is warranted but our older orchards must be replaced if production is to be maintained. Only the best sites and soils should be used; only the most profitable varieties should be planted and by the best growers. The apple business requires great knowledge and skill and the beginner should proceed cautiously.

J. K. Shaw

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Nursery Inspection in 1946. All the nurseries examined in 1945 have been visited in 1946, also a few examined in earlier years. In addition, several nurseries in Alabama and Tennessee were included this year. In fact, we have had more requests for inspection than could be met. Our problem in the immediate future will be to find qualified men to do the work. A request to the Pomology Department, Mass. State College, will bring a list of inspected nurseries. There are 28 nurseries in this list. J. K. Shaw

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GROUND TREATMENTS AS AN AID IN APPLE SCAB CONTROL.

In a well written bulletin under the above title by D. H. Palmiter of the Geneva, New York Agricultural Experiment Station the use of certain materials on the orchard floor is summarized as follows: "Apple scab control experiments indicate that the amount of primary inoculum (spores of Venturia inaequalis in over-wintered apple leaves) in a year favorable for disease development may determine the success or failure of the scab control program. Orchards in which less than 5 per cent of the old leaves contained spores were well protected from apple scab infection with from five to seven applications of wettable sulfur. Similar orchards with more abundant inoculum required extra fungicidal applications and higher concentrations of sulfur for equal disease control. Nine

years of laboratory tests and field experiments showed the effectiveness of certain chemicals in killing or preventing the discharge of ascospores of the scab fungus.

"Nitrogen fertilizers, such as nitrate of soda and sulfate of ammonia used at 12 per cent concentration, were effective, but the 500 to 600 pounds required per acre for effective coverage increased the nitrogen supply available to the trees beyond the optimum amount for best fruit quality.

"Elgetol used at 2 quarts to 100 gallons reduced the primary inoculum more than 95 per cent when carefully applied and resulted in improved scab control. The ground treatments were most effective in years of excessive rainfall, like 1943 and 1945, and reduced the amount of fruit infection on trees receiving a wettable sulfur program from 20 per cent to 2 per cent." As a concluding statement Dr. Palmiter says "No foliage fungicide sprays should be omitted because of the ground application. It is an extra application to give extra protection in scabby orchards." (The above publication is Bulletin No. 714.)

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DEVELOPMENT OF ORGANIC FUNGICIDES.

In order to understand present day developments in plant pest control, J. G. Horsfall of the Connecticut Agricultural Experiment Station says, "The farmer must brush up on his chemistry." In a recent issue of the AIF News he gives us a little insight into the procedure involved in discovering and testing organic fungicides. Following is a quotation from his article: "The first step in developing a new fungicide is the 'Edisonian approach: try everything once.' We at Connecticut have tested some 6000 compounds that way. It is slow. It is laborious. It is not very productive.

"Having discovered a few possibilities, one then examines their chemical structure. Referring to his college chemistry, he will remember that every chemical is built up of parts which fit together in a certain way. The chemist can draw a picture of a chemical. This is called a structural formula. If they see that the structural formula for a new compound resembles that for a known fungicide, they can be fairly certain that the new compound will also be a fungicide.

"Automobiles are built of wood, iron, copper and some other things. So are houses and factories. An automobile is a car because these ingredients are put together in a certain fashion; a house differs chiefly in that the materials are put together differently. Hence a fungicide differs from a foodstuff mostly because the ingredients are tied together differently, and each can be recognized because of that fact.

"In our laboratories we pass a new chemical through a series of screening tests. First we see if it will kill a fungus in the laboratory. We then find whether it will kill at a concentration economical enough to compete with established materials. Then we expose a sprayed surface to artificial rain and sun. If it still kills the fungus after this weathering, it is ready

for a greenhouse trial.

"Spraying on foliage in the greenhouse is the test for injuriousness. If it is not injurious, we treat pea seed and plant them. The chemical is exposed in the soil to very tough conditions tending to destroy it. If it succeeds in protecting pea seeds, it definitely has promise and goes then to the field. It is given one year's field testing at our research farm, using a wide variety of plants and diseases - apple scab, apple rust, tomato and celery leaf spots, and rose diseases. Sometimes the chemical 'blows-up' in the field. After one year's field research, it is ready for trial by farmers, and by the third season it is ready for sale and large scale use. Even then, nationwide experience with it will develop 'bugs' that will have to be ironed out as experience develops."

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It Pays to Place Good McIntosh in Cold Storage. The advantage of cold storage over common storage is well illustrated in these quotations from recent Special Apple Market Reports: October 17, "Many McIntosh offerings are not cold storage and are very ripe. These are still selling nearly 75 cents below equivalent grade of cold storage." October 22, "Hard Fancy cold storage McIntosh remain in greatest demand." October 24, "All common storage fruit showing condition ripe, selling mostly .75-1.00 below like grade of hard cold storage stock."

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CONDITION OF APPLES IN RETAIL STORES.

A survey of retail stores in Columbus, Ohio, was made by P. C. Crandall of Ohio State University during the winter of 1940-41 to determine the actual condition of apples offered to consumers. The results of this survey, published in Bulletin No. 35 of the National Apple Institute are so timely that they are reprinted here for the readers of Fruit Notes. They suggest one reason why the consumption of apples fell from 44 pounds per capita in 1920 to 32 pounds per capita in 1940. Following is a part of the above report. "The survey was to determine what was the actual condition of apples as they were offered to consumers in a cross-section of retail stores during the past winter. The city, the stores, and the apples are typical; there is every reason to believe the findings are illustrative of a situation which exists generally across the country.

"The average housewife purchases fruit on appearance and past experience. Since condition plays such an important part in appearance, it may be assumed that condition plays the same important role in consumer demand. This paper is the report of a survey made on the Columbus apple market during the winter of 1940-41. It was made to determine the actual amount of mechanical damage present on the apples as they are displayed to the consumer. The data were collected by making a store-to-store canvass. Both large and small, chain and independent stores were included in the survey. The study was made over a period of time running from the latter part of November until the middle of April. At each store the fruit in the

displays was examined apple-by-apple.

"Apples on display showing signs of never having been graded and sorted were omitted from the survey. Those which started out from the grower as culls were, in this way, eliminated from the results and a clearer picture of the actual situation obtained. In determining the various types of damage, the following classification was used: 1. Slightly bruised--(Enough damage to affect the external appearance); 2. Severely bruised--(Many small bruises or large bruises an inch or more in diameter); 3. Undecayed skin breaks; 4. Decayed skin breaks. There were 57.9 per cent sound fruit in the average grocer's display.

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|---|---|
| Sound fruit | 57.9% |
| Slightly bruised | 21.9 |
| Seferely bruised | 11.4 |
| Skin breaks, undecayed | 5.2 |
| Skin breaks, decayed | 3.6 |

"The practice of over-packing alone accounts for many of the bruises present on the apples in the grocers' displays. For every apple added to form an extra large bulge, there is at least one severely bruised apple and several slightly bruised ones. The extra weight added in the form of a large bulge is more than off-set by the waste and falling-off in condition due to over-packing. Quite a few of the slight bruises on the locally-grown fruit can be blamed on the grocers' methods of displaying the apples. Because of poorer quality and methods of packing, the Ohio apples were dumped into bins or mass displays more often than Western apples which were usually displayed in their original containers. The individually-wrapped apples from the West seemed to command the respect of the clerks and they handled them carefully. Most of the Ohio-grown apples were 'Growers Grade' which meant that they were often below U. S. Number One grade. They were not packed according to size and presented a jumbled appearance. They did not command the respect of the clerks and as a result they were handled carelessly and bruising was prevalent."

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Bruising is one of the most important problems of every McIntosh grower. The solution will be found in either less handling of McIntosh apples or a better container, or both. R. A. VanMeter

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IDEAS VS. DOLLARS -
You have a dollar; I have a dollar; we exchange. Now you have a dollar; I have a dollar; neither is benefited.
But you have an idea; I have an idea; we exchange. Now you have two ideas, I have two ideas; both have benefited. -That's co-operation.

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Commercial Apples. The U.S. apple crop is estimated at 120,657,000 bu.- 75% more than the record low 68,042,000 bu. produced in 1945 but practically the same as the 1935-44 average production of 120,962,000 bushels.

POSSIBLE REASONS FOR POOR COLOR OF BALDWIN APPLES.

Baldwin apples in many orchards showed inferior color this fall even though harvest was delayed until October 15 or later. This lack of color may be related to an unusually mild month of October. Here's one theory, for what it may be worth.

In most seasons a heavy frost occurs before the first of October. This tends to check leaf activity and set the stage for the development of color in winter varieties. During the current season only light frosts occured in many areas even as late as mid - October, and the leaves continued to manufacture starch. As this is being written (October 30) the weather is still so warm that apples hanging on trees may still be increasing in size and certain other growth processes may be continuing on a moderate scale. A rank growth of new grass in recent weeks is further evidence that Nature is taking advantage of the springlike weather in one last vegetative fling.

Our theory, then, is briefly this - A supply of the material (glucocide), from which the red color pigment is made, failed to materialize because the starch was continually being used elsewhere. And so the Baldwin apples remained more or less green. A heavy frost might have done two things: (1) Induce the tree to terminate its summer activities, and (2) Bring on the clear atmosphere which favors the transmission of ultraviolet light, a very effective aid in the coloring process.

But Baldwins in some orchards may have failed to color for another reason, - red mite. The leaves were actually so bronzed as to be very inefficient in starch manufacture. Very poor leaves mean very limited starch supplies, slow maturity of the fruit and retarded color development. There is reason to believe that red mite tends to build up more rapidly where DDT is used since it kills off some of the natural enemies of the red mite.

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TREATMENT OF PRUNING WOUNDS.

Much valuable time is wasted in painting pruning wounds. In fact some amateurs seem to place more emphasis on painting than they do on cutting off the proper limbs. In a vigorous tree, any correctly made cut up to 1½ or 2 inches in diameter tends to heal completely before decay sets in whether treated or not. Larger cuts, particularly on winter injured trees, should perhaps be treated.

Decay in older trees is taken for granted and, if we assume that a 40-year-old apple tree has reached the replacement stage, we are naturally less interested in preserving it intact as we might a valued antique. Maintenance of a strong framework throughout the useful lifetime of the tree and protection of the foliage are more important than the mere treatment of pruning wounds. For without these two essentials we are attempting to patch up a decrepit shell instead of focusing our attention on things that count.

In Cornell Bulletin 821, by Welch and MacDaniels, the essentials of a good wound dressing are stated as follows: "Wood decay greatly limits

the life and usefulness of orchard trees. Decay in older trees is universally taken for granted, and thus it often happens that too little attention is paid to the possibility of preventing or at least postponing the start of decay. A practical and satisfactory method of treating wounds, particularly pruning wounds, would go far toward postponing damage by wood decay.

"Whenever the bark covering woody plants is cut or broken, the resulting wound permits the entrance of destructive fungi and insects, which cause rot and disintegration of the wood. Since these organisms are chiefly responsible for the deterioration of otherwise healthy trees during their most productive years, the effective treatment of wounds is important in maintenance of fruit and shade trees. Causes of wounds are numerous, and most of them are familiar. In the orchard, pruning operations cause the most wounds, and although these are intentional, they nevertheless endanger the tree. Protective treatment of such wounds is thus important.

"The object in treatment is to protect the exposed wood from fungi and insects, yet to interfere as little as possible with the normal healing process. Many materials[1] have been proposed as wound dressing for trees, but no one substance has yet proved to be entirely satisfactory. The reasons why tested materials have been found faulty become obvious when the essential requirements for a good wound dressing are considered. Briefly such a material must be: (1) Durable under all conditions of exposure, maintaining a permanent and continuous surface which will prevent checking and cracking of the wood. (2) Not seriously injurious to freshly exposed living tissues of bark, cambium, and sapwood. (3) Impermeable, repellent, or toxic to fungi, insects, and other harmful organisms or agents. (4) Inexpensive and readily obtainable. (5) Easy and convenient to store, handle, and apply. (6) Inconspicuous. (applies particularly to shade trees)."

After testing 24 materials including white house paint, Bordeaux paint, copper resin, and variations of asphalt water emulsions, asphalt paints, orange shellac, blue wagon paint, coaltar paint, red barn paint, and waterglass, the authors draw this conclusion: "The results of these studies do not point to any one material as being entirely suitable for treating pruning wounds on trees. From the standpoint of durability and freedom from injury to the cambium, asphalt-water emulsion, white house paint, fibrated asphalt paint, Bordeaux paint, and copper resin have considerable promise."

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More Freezer Lockers. More than 8000 freezer locker plants are now in operation in the U. S., of which over 1500 were built last year - the largest number for any year on record.

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One Advantage of Plane Transportation. A gain in weight amounting to as much as 24% is reported in peaches allowed to mature on the tree as compared to those picked at the usual stage for rail shipment. This may amount to a carload of fruit per day from a 40 - acre orchard.

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[1] More than 100 compounds or mixtures are listed in the literature as having been tried.

# Fruit Notes

December 30, 1946

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents



## THE 1947 APPLE SPRAY CHART

In order to keep pace with new developments in materials, the 1947 Apple Spray Chart will differ from that of previous years in one important respect. Instead of indicating "What to Use" by specifying the names and amounts of only the more common materials thus excluding other highly effective materials, this year's chart lists the "Acceptable Insecticides" and the "Acceptable Fungicides" for each application. In the Notes the conditions under which each of these materials is used are presented in some detail. For the

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inexperienced grower the new chart will obviously be confusing and we anticipate all sorts of complaints because it lacks the specific recommendations of previous years. For the experienced grower, however, who is able to supplement the chart with his own experiences, the new set-up may be a real improvement.

In this issue of Fruit Notes we present the Notes having to do with Insecticides. In the next issue, the Notes on Fungicides will be presented. The printed chart should be ready for distribution by mid-winter.

Insecticides (Dormant and Delayed Dormant Sprays) The choice of insecticide depends on the pests to be controlled. Dinitro compounds are most effective against Bud Moth, Rosy Aphis, and the eggs of other apple plant lice. Oil emulsion or miscible oil is desirable to combat Red Mite and San Jose Scale. If one or more pests of each group are present, a combination of oil and dinitro is recommended. Dinitro compounds (dormant) as prepared for dormant spraying must be applied when the trees are strictly dormant to avoid injury to the buds. They should be used according to the manufacturers' recommendations. They are available as (1) a liquid to be diluted in water (Elgetol and Krenite); (2) a powder to add to water or to an oil emulsion (Dow DN dry wettable), and (3) a combination of DN in oil (Nitrokleenup Dow Spray Dormant). When a DN-oil combination is prepared in the tank, it is desirable to reduce DN to one-half or two-thirds the amount required when used alone.

Miscible oil or oil emulsion as prepared and recommended by established manufacturers is generally satisfactory. Paste type oil emulsions are frequently preferred. For control of Red Mite 3% actual oil, and for the San Jose Scale 2% actual oil, in the diluted spray is advised. If an 83% Oil is used, 3 5/8 gallons in 100 are required for a 3% actual oil dilution, while 2 1/2 gallons result in 2% actual oil. If a 75% Oil is used, the amounts for corresponding dilutions are 4 gallons and 2 3/4 gallons, respectively. Oil sprays should not be applied when there is danger of continued freezing weather before the spray dries.

Insecticides (Summer Sprays) Lead arsenate (standard or acid form) is the most commonly used stomach poison during the growing season. It is compatible with the other insecticides listed and with most fungicides. The preferred dosages in 100 gallons are: Pre-blossom sprays - 3 pounds; Calyx, 1st and 2nd Cover - 4 pounds; 3rd Cover - 3 pounds; 4th Cover - 2 pounds.

In the 1st Cover period when young fruit is growing rapidly, spreading and sticking is greatly increased by adding 1 pint of fish oil or raw linseed oil as follows: In a separate container wet the lead arsenate to a thick paste, add the oil slowly, and stir to consistency of paint; dilute with water and pour into tank. In the 2nd Cover, when the first generation of the Codling Moth is most active, DDT can be substituted for lead arsenate effectively. In the 4th Cover, DDT or a combination of DDT (50%) 2 pounds and lead arsenate 2 pounds is desirable on varieties later than McIntosh to protect against late Codling Moth, Leaf Roller and Bud Moth as well as Apple Maggot flies.

40% Nicotine sulfate is very effective for combating Apple Red Bug and Apple Aphids. One pint in 100 gallons (1-800) is usually sufficient, and it is compatible with all other recommended materials. When used alone, nicotine sulfate should be fortified with 2 to 4 pounds of dissolved soap or soap flakes but in combination with other insecticides or fungicides the soap is unnecessary and may be harmful. For combating Leafhopper, DDT may be substituted for nicotine.

DDT is both a stomach poison and a contact insecticide which retains a toxic residue for 10 to 20 days. The preferred form for orchard use is wettable powder containing 20% to 50% DDT (most brands are now 50%). Less is known about the effectiveness and compatibility of the emulsible concentrate. The standard formula is 2 pounds 50% wettable powder or 4 pounds 25% wettable powder (both equal 1 pound actual DDT). DDT is recommended in: 2nd Cover - to control Codling Moth (first brood,) and in the 4th Cover - to control Codling Moth and Leafhopper (both second brood) especially on varieties harvested later than McIntosh. Experiments indicate that 2 pounds 50% DDT and 2 pounds lead arsenate are more effective than 4 pounds lead arsenate in all post blossom sprays, and the combination is suggested where any of the insect pests are abnormally abundant. DDT is compatible with all materials except lime. It should not be used in pre-blossom applications because of possible harmful effect on pollinating insects.

Dinitro compounds (summer) such as DN-111, used at the rate of 3/4 to 1 pound or as advised by the manufacturer, is effective for summer Red Mite control. Dusts such as DND4, are also effective. Both sprays and dusts are compatible with lead arsenate, DDT, wettable sulfur, and Fermate and may be used safely after the 1st Cover when temperature is below 90° F., or below 80° F. if combined with sulfur. For prevention, this material may be added to the 2nd Cover spray or it may be applied separately when a Red Mite infestation threatens.

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"Be not the first to try the new, nor yet the last to lay the old aside." (Pope)

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Three Opportunities. Wanted -- (1) a good orchard, 1000 trees, frost free location, serviceable equipment, (2) an experienced orchard superintendent, and (3) to dispose of sprayer, 30 gal/min., 500 gallon tank with tower, accessories. (Write for details).

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No November FRUIT NOTES Because of a shortage of mimeograph paper we were asked to combine the November and December issues. By February we hope that our stock of paper will be replenished and we'll be back on a monthly basis again.

## A 10-YEAR LOOK AHEAD

At the Production Conference in Amherst, Dec 10 and 11, The Fruit Committee submitted the following report: Of necessity, the fruit grower is a forward looking individual. He is interested in long range developments and is accustomed to planning for the years ahead. In 1920, the Massachusetts Fruit Growers' Association set up a so-called Ten Year Program which embodied the objectives of the industry as viewed by the leaders at that time. In 1931, the Ten Year Program was revised, and now after a war-time delay of several years, a committee is at work making a second revision. Since the full committee of the M. F. G. A. has not yet completed its recommendations, this report is a preliminary one looking forward to 1957.

Future Plantings. Soils and sites must be carefully considered in all new plantings and in the extension of present plantings. The past two years have emphasized the fundamental importance of a good orchard location.

Varieties. The list of commercial apple varieties known as the New England Seven, formulated in 1928, needs to be evaluated in accordance with present day conditions. The McIntosh still heads the list although future plantings will be made with more attention to suitable pollenizers including Cortland, Delicious, and a few others. The Cortland is of more importance today than it was a decade ago and now deserves a place in our commercial list. Northern Spy and Baldwin will be planted sparingly. Wealthy, Gravenstein, and Rhode Island Greening are in much the same class. Early McIntosh and Gallia have gained in favor and may come into somewhat greater prominence.

Diversification. More attention must be given among apple growers to the production of other fruits, such as peaches, pears, small fruits, and in some cases to vegetables. Livestock and poultry are apparently less well adapted to the specialized fruit farm. Where these enterprises are included in the farm program the special requirements of each as regards land, seasonal labor, and equipment must be borne in mind.

Pest Control. The Committee recommends continued testing of new and promising spray and dust materials. Experiment Station tests of DDT, Fermate, etc., together with the experiences of growers will bring about more effective fruit pest control. The next ten years are likely to see radical changes in spray materials, spraying and dusting equipment, and in methods of application.

Soil Management. In the past five years rapid strides have been made in correcting a serious deficiency of magnesium in Massachusetts orchards. The use of high magnesium lime, magnesium sulfate, etc. marks a great advance in the fruit industry. Our soils are, on the average, low in available magnesium. The replenishment of this element in the soil must be placed on the same basis as nitrogen, which most growers apply annually. The so-called complete fertilizers do not take into account this essential mineral element. The use of magnesium and boron, and of mulching materials must receive continued

emphasis during the next ten years.

Orchard Reorganization. The Committee recommends a thorough reorganization of all present day orchards. Many of our orchards are below par for one or more of the following reasons: (1) trees crowded, (2) too many obstructions such as stone walls, boulders, brush, etc., (3) lack of pollenizers, (4) poorly drained areas, (5) inconvenient water supply for spraying, (6) too many old trees, and (7) need of extension by planting a new block on a good soil and a frost free site. These factors must be stressed during the next ten years. Our fruit industry will be on a firmer basis in 1957 if growers reorganize all present plantings.

Marketing. Rough handling of fruits probably detracts as much from their sales value as insect and disease blemishes. A method must be worked out to place the McIntosh apple in the hands of the consumer in better condition. This means more careful handling and a better container. The problem should be attacked from several angles: (1) handling more carefully on the farm while the fruit is still under the grower's control, (2) eliminating unnecessary marketing machinery, (3) development of containers to protect the product all the way from the tree to the consumer. In conclusion, the Ten Year Program Committee looks forward to 1957 with optimism. As we tackle the problems enumerated above, taking advantage of new developments, and pooling the experiences of all concerned, we shall find ourselves in an increasingly good competitive position and we shall be able to deliver to the consumer a fancy product at a fair price. D. W. Cheney, Fruit Committee Chairman.

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Fruit School for Commercial Growers Plans are being made for another Fruit School at the State College in Amherst. The tentative dates are March 31 to April 2. By scheduling the School during the Spring Vacation, we shall have facilities not available while classes are in session. Staff members for example will not be tied up with class work.

## LENGTHENING THE SHELF LIFE OF FRUITS AND VEGETABLES

In a recent issue of DuPont Agricultural Comment, Dr. C. W. Hauck, of Ohio State University presents these interesting facts concerning perishable products: "'Shelf Life' is a term which may be foreign to many fruit and vegetable growers. To the retailer of these commodities, however, it spells profit or loss. In the parlance of retailers, 'Shelf Life' is the period of time during which the produce received by the retailer remains fresh, attractive and appealing to the customer. Enough so that the retailer is not forced to reduce the price in order to move the product.

Fruits And Vegetables Are Alive. Although we seldom consider them as such, fresh fruits and vegetables are living, respiring parts of plants. They must be cared for and handled as such for they are materially affected by conditions to which they are subjected. The life of apples, peaches, tomatoes, cabbage, or the like is shortened by any factor which has a tendency to speed up the

normal ripening or aging process, or any factor which permits dehydration, decay, physical damage or other deterioration. In contrast with this, the life of fruits and vegetables is prolonged by favorable temperatures and humidity, gentle, careful handling, protection from insects and diseases and other protective measures.

It is true that 'Shelf Life' is a factor which is the major concern of produce retailers. On the other hand, growers cannot afford to take an indifferent attitude toward this problem. Directly or indirectly it definitely affects their welfare. Produce which does not keep well on the shelf and does not attract the eye of the consumer is produce which may not command a return order. In order to avoid excessive losses, a retailer may offer only limited quantities of produce in an effort to keep them moving over his counter. This in turn will result in limiting sales outlets of producers. The grower of fruits and vegetables may determine 'shelf life' as early as the plants are set in the field or before the first buds appear on the tree. Herein the producer becomes responsible for the use of tested and proven varieties, and for the control of insects and diseases which may ultimately affect the 'shelf life' of this produce months later.

Not all the responsibility for the 'shelf life' of fruits and vegetables can be laid at the feet of the producer. It must be realized, however, that this is the beginning point and that fruit or vegetables do not improve in quality after they leave the vine or tree. In other words, the quality must be in the produce when it is harvested. It is true that conditions in produce handling by wholesalers and others among the line to the retailers may greatly reduce the 'shelf life' of produce, but they can never improve the quality.

In the not too distant future the quality of produce on the dealers' shelves will again become the major factor in determining the acceptance of that product by the consumer. As a result, it behooves every producer who is anxious to continue to produce for a discerning public, to make available from his orchards, fields or gardens the best fruits and vegetables which agricultural science and mechanical developments are able to produce. Factors of weather, moisture, soils and the like present sufficient problems in the growing of quality produce, so that no grower can afford to overlook the opportunities of favorably affecting all other factors which are within his control. In the long run there is no substitute for quality."

## FRUIT GROWING IN POLAND

Dr. Stephen Pieniazek, formerly a member of the R. I. State College staff and now in charge of work in Pomology in a University at Skierniewice, Poland, writes as follows on conditions in that country: "The fruit growing situation in Poland is this. The orchards are few and not taken care of properly. Spraying was abondoned in many instances during the war because of wearing out of the old equipment while no new machinery was manufactured.

No power sprayers were ever used in Poland. This is true also for most of German orchards. Knapsack and barrel sprayers were the most common. They give satisfactory results in view of the fact that our pests are not as bad as yours. I have seen orchards where no spraying was done producing a fair fruit.

We have some good orchards and some very different from yours. There is a two hundred acre orchard in Osiny near Skierniewice composed of dwarf and semi-dwarf apple trees. The dwarfs are treated here as you would treat tomatoes. They are planted as close as 6 x 3 feet and bear fruit next year after planting. This is the system of the so called "intensive orcharding". The apple trees are not the only crop grown on the soil. At least two successive crops of vegetables are grown between the trees each year, early cabbage and snap beans for instance. Heavy fertilization and continuous cultivation enables the soil to give heavy yields.

Our standard orchards are never grown in sod. It is claimed that our climate is too dry for this system (20 inches rainfall). The soil is cultivated in the spring and cover crops are sown for the late summer and fall in mature orchards. Vegetables, potatoes and similar crops are grown in young orchards.

We have a plant as a cover crop here that, I think, far exceeds most cover crops I have seen growing in the United States. This is lupine. It makes a very quick growth and gives a large volume of green material. It will stand dry weather very well and will grow on very poor soil. As a legume it is especially desirable. It is much hardier than soy beans and is killed by a rather heavy frost. It's stems are thick and sturdy which makes it very good plant for retaining a great deal of snow in winter.

As I understand it lupine was recently introduced in Florida and other Southern States where it was enthusiastically received. I think it would grow even better in the North and would give better results as cover crops in peach orchards than the plants you grow there at present. You could get seed for trial from Florida. If you want it I would be very glad to send you some of our seed if American quarantine laws will permit its entry. We would arrange here for the inspection of seed to be sent to you.

We have started work on reconstruction of our fruit growing here and I am in charge of planning experimental work in pomology. We are ready to plant large experimental orchards in the spring. The necessary lands and funds have already been granted by the government. On our College land there will be a new experimental orchard of over a hundred acres planted in the spring. The work on soil management and fertilization, annual bearing, winter resistance and so on will be done here. I will have one block here of 25 acres just for soil management studies."

## PRUNING BEARING TREES

One side of the pruning problem is often overlooked. It takes relatively few vigorous, well placed branches to produce a full crop of high quality fruit. If the ideal distribution of good branches on an acre of orchard can be obtained with half as many trees, that is a real advantage because the extra trees mean an added drain on soil fertility and moisture, to say nothing of their shading effect on the other trees. Fruiting branches must have good exposure to light. The individual trees must therefore be well spaced. Ground level pruning of half of the trees means economy in spraying, fertilizing, thinning and later pruning. Instead of thinking entirely in terms of pruning the individual tree, we ought to consider the job on an acre basis. A number of well placed branches on a few trees is better than a few such branches on many trees. The majority of bearing orchards in Massachusetts include too many "boarder" trees. The bulldozer is an ideal tool for eliminating these unwanted trees. When they are out of the way the remaining trees present much less of a problem. Drooping, shaded, submerged, and otherwise handicapped branches and parts of branches should be removed. Each remaining branch deserves a "place in the sun". The branches we retain are much more important than the ones we cut off.

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(First number indicates the month; second, the page.)