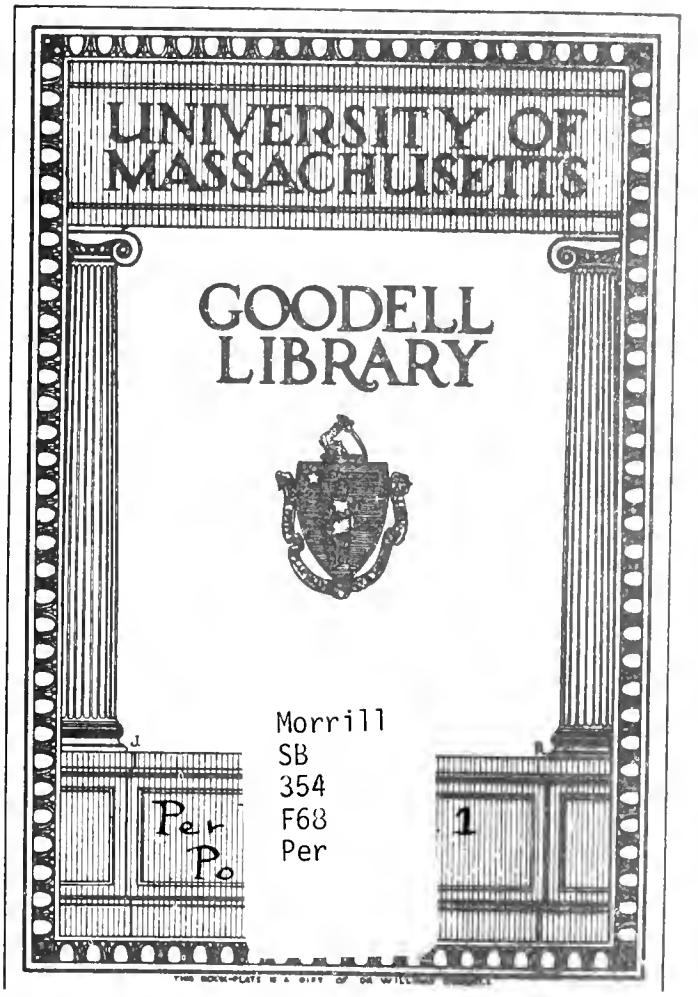

UNIVERSITY OF MASSACHUSETTS
GOODELL LIBRARY
Morrill
SB
354
F68
Per
Per
Po
1

FRUIT NOTES

JULY 1935 - NOVEMBER 1949

Extension Service
University of Massachusetts

(Set No.2)

FRUIT NOTES

1936 - 1949 (inclusive)

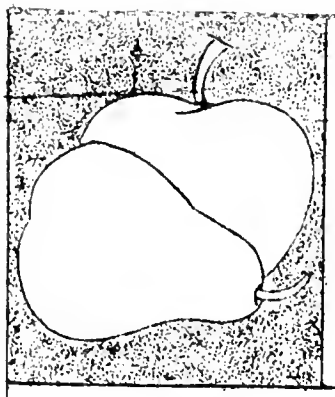
(Compiled by W. H. Thies, Extension Horticulturist)

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.

February 26, 1947

Prepared by the Fruit Program Committee
of the Extension Service

W. H. Thies, Extension Horticulturist

Contents

SCHOOL FOR COMMERCIAL FRUIT GROWERS - MARCH 31, APRIL 1 and 2.

A Fruit School to be held at the State College on the above dates will differ from last year's school in several ways: (1) the sessions will cover three days instead of four, (2) to permit certain staff members to participate, the School is scheduled during spring vacation instead of mid-winter, (3) weather permitting, there will be two out door sessions. The program and an enrollment card will be mailed about March 1 to individuals on the Fruit Notes mailing list.

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.

This School is limited to commercial fruit growers, orchard foremen, new or prospective orchard owners, and orchard workmen. The discussions will center around commercial enterprises and for that reason will not meet the needs and interests of the backyard fruit grower. Success in any enterprise in this modern age depends upon both a fundamental knowledge and the latest technical developments. It is the purpose of the School to furnish just this type of information. To obtain the maximum benefit from the School, prospective students should plan to attend all of the scheduled sessions.

Department of Pomology and
The Extension Service

VARIETIES OF FRUITS FOR MASSACHUSETTS, LIST REVISED FEBRUARY, 1947.

Arranged approximately in order of season (*Most reliable for commercial planting).

1. Apples - Lodi, Early McIntosh, Milton, *Red Gravenstein, Wealthy, *McIntosh, *Delicious (a red strain)(1), *Cortland, Macoun, Rhode Island (Greening), Golden Delicious, *Baldwin, Red Spy, Gallia. (Delicious and Cortland are excellent pollenizers for McIntosh.) (1) Richared is apparently no longer listed by eastern nurseries. Crab Apples - Young America and *Hyslop.

2. Pears - *Clapp, *Bartlett, *Seckel, Gorham, *Bosc, Anjou, Dana Hovey.

3. Peaches - Marigold, Oriole, *Golden Jubilee, Triogem, *Halehaven, Summercrest, Belle of Georgia (w), *Elberta, J. H. Hale, (w) white flesh.

4. Plums - *Formosa (1), *Santa Rosa (1), Imperial Gage, Grand Duke, *Shropshire Damson, *Stanley, Hall, *Albion, (1) Japanese type; others European.

5. Cherries - Sour -*Montmorency, English Morello, Duke - May Duke, Sweet - *Schmidt, *Windsor, Gold.

6. Quinces - Orange, Champion.

7. Grapes - *Fredonia, Ontario, Delaware, *Worden, Brighton, Niagara, Concord.

8. Strawberries - *Howard 17 (Premier), Dorsett, Pathfinder (1), *Catskill, Sparkle (1), Mastodon (everbearer), (1) Red Stele resistant.

9. Raspberries - Black - Not reliable in Massachusetts, Red - *Chief, Marcy, *Latham, Milton, Ranere (St. Regis) - (everbearer), Purple - Sodus.

10. Blackberry - Eldorado.

11. Currants - *Wilder - not allowed in many towns. Consult Department of Agriculture, State House, Boston, Mass.

12. Blueberries - Cabot, Pioneer, Concord, *Rubel, *Jersey.

Note: Many varieties of fruits are partly or wholly self sterile. Usually it is best to plant more than one variety. (The list of varieties recommended for trial only will appear in the next issue of Fruit Notes.

SHRIVELLING OF APPLES IN STORAGE

In the animal world, a wrinkled skin may suggest old age. Not so in an apple. If an apple shrivels in storage its a safe bet that the owner has been careless about the humidity of the storage air. Whenever apple cells lose water to the surrounding air or to the container, they tend to shrink, and the skin which encloses them becomes wrinkled. This condition is widespread in Massachusetts storages, and in some cases, serious. The reasons are obvious.

The difficulty may go back to the harvest season when the crop was placed in dry boxes. Then to make matters worse, the boxes were set in a dry storage and nothing done in the meantime to increase the humidity of the storage air. In one storage, the boxes near the ceiling along a dry wooden beam seemed to shrivel worse than the others. Dry storage conditions are very easily overlooked. They creep upon us gradually without much advance warning. To play safe we ought to provide ourselves with a simple device for testing, such as a wet and dry bulb thermometer and a relative humidity table. 85% relative humidity should be considered a minimum.

If boxes are left out in a rain before harvest that will help to prevent drying of the apples. Then the floor of the storage should be wet down from time to time or whenever there is a suspicion that the air is getting dry. And as might be expected Golden Delicious, russetted Baldwins and scabby McIntosh tend to shrivel early because they have a poor protective covering. Shrivelling can be prevented, but not by the methods in common use in many of our storages.

- - - - - - - - - - -

Winter Injury in Fruit Trees. There are at least eight distinct kinds of winter injury in fruit trees. Some are much more common than others although all have probably occurred in Massachusetts. They are as follows: root killing, bark-splitting, trunk-splitting, sunscald, crotch injury, killing back of branches, black heart, trunk injury, Killing of dormant buds and winter-killing of swollen buds may also be classed as winter injury.

THE 1947 ORCHARD FERTILIZER PROGRAM

During the war we were told that in the peace time to come fertilizer nitrogen would be in over supply. Evidently that time is not yet here for we are told that during the spring of 1947 nitrogen will be in very short supply. Most Massachusetts orchards are in sod and the grass must be fed as well as the trees; of course the grass rots and this nitrogen may eventually get into the trees.

Probably a few orchards get too much nitrogen in an effort to increase yields, and color and firmness may suffer. Sometime in the near future we are going to have a big crop and a smaller nitrogen application might result in a smaller crop of better colored apples. When this bumper crop will come is anybody's guess.

A common recommendation is ½ lb. of nitrate of soda, or the equivalent . for each year of age of the tree; thus a 40 year old tree might get 10 lbs. of nitrate or the equivalent in other carriers. This prescription should not be taken too exactly. If the soil is one that is called very fertile,a lesser amount, and on one of low fertility a larger amount might be better.

If a grower is unable to buy as much nitrogen as seems necessary he may resort to the practice recommended during the war of suppressing grass in the orchard during spring, thus reducing the nitrogen requirement. Unless trees are starved for nitrogen, feeding them nitrogen in midsummer or later is extremely unwise. We want rather high nitrogen in the trees in spring and early summer and a reduced amount in late summer and fall. This march of tree nitrogen favors a large leaf area and good set of fruit and then better color and less harvest drop.

Apple trees ought usually to have nitrogen fertilization every year and most orchards will profit by a complete fertilizer every few years.

J. K. Shaw

INJURIOUS EFFECTS OF LONG CONTINUED CULTIVATION

The Ohio Experiment Station compared the physical and chemical state of 12 Lake Erie vineyard soils which had been under cultivation for very long periods, with soils of adjacent fence rows which were presumably like the vineyard soils in their earlier years. These studies indicated a great loss of organic matter and nitrogen, also of calcium and exchangeable bases. Apparently acidity had increased in most but not all the vineyards. It is of especial interest to note that there was as much tendency to gain as to lose potash and a greater tendency to gain phosphorus. The behavior of magnesium was not reported. Where organic matter and nitrogen were very low, the application of commercial fertilizers availed little. This is another illustration of the value of organic matter in agricultural soils. Few Massachusetts orchards are in cultivation but it is wise to pay attention to the organic matter in sod orchards. The value of heavy mulching lies largely in the abundant organic matter supplies. (Ohio Bulletin 663, 1946).

J. K. Shaw

THE DAVEY APPLE

There was considerable interest in the new Davey (Davenport 25) apple at the recent fruit meeting at Worcester. This variety has been under observation at the Experiment Station for ten years and has cropped for four or five years. It originated with S. L. Davenport of North Grafton from a McIntosh seed but it shows few McIntosh characters. The tree has some faint resemblance to Wealthy but as a commercial variety its possibilities are as a replacement for Baldwin.

Its habit of growth is upright spreading, better than Early McIntosh, not as good as Milton or McIntosh, and no worse than Wealthy. We have not observed its behavior in a test winter. No signs of winter injury have been seen and we feel quite confident that it is hardier than Baldwin. It comes in bearing as early and perhaps earlier than McIntosh and so far a bearer annually. While it may not bear as regularly as McIntosh we feel sure that it will prove a more dependable producer than Baldwin. It is not susceptible to scab, bitter pit or other diseases. It is not quite as vigorous as Baldwin and may be planted a bit closer in the orchard.

The fruit is harvested with Baldwin and will keep in storage as long or longer. It is, on the average, as attractive in appearance as Baldwin and seems to be more uniform. It is always well colored but not as bright as the best Baldwins. Few varieties will stand handling with less injury. The quality is good but not in the McIntosh class. It is more like Stayman which it somewhat resembles in shape. It must not be stored in low humidity nor exposed long to heat and dryness when removed from storage. This tendency to wilt is its greatest weakness yet observed but it should be possible to overcome it by proper handling.

It would be reckless to say that the Davey could become a major variety; it may develop weaknesses not yet evident. We do not know how productive under all conditions it will be. If produced in quantity it will meet with sales resistance in the market as all new varieties do.

It seems to be equal or superior to Baldwin in all respects except that it wilts more in low humidity. It is worth an extensive trial as an improvement on Baldwin.

Trees of Davey are not yet available and the College is not now sending out propagating wood. It is hoped that Mr. Davenport will see fit to make trees available for trial in the near future.

J. K. Shaw

THE 1947 APPLE SPRAY CHART

As this is being written, the galley proof of the new spray chart has just arrived from the printer. In a previous issue of Fruit

Notes we presented the new notes pertaining to insecticides. We include herewith the notes on fungicides, dusts and miscellaneous materials.

Protectant Fungicides. The following are acceptable:

	In 100 Gallons
Dry Wettable Sulfur	8 lbs.
Paste Wettable Sulfur	12 lbs.
Dry Lime Sulfur	8 lbs.
Liquid Lime Sulfur 32° Baume	2 gals.
Iron Carbamate (Fermate, Karbam)	1½ lbs.
Puratized Spray	1 pint

Except for Puratized, after Calyx the amount of fungicide may be reduced gradually, if the Scab has been controlled well by the early sprays, but the quantity should not be less than one-half of the original. When applied to wet trees or during rains the concentration should be increased by one-third to one-half. One-half pound of iron carbamate, such as Fermate or Karbam, combined with half strength wettable sulfur is more effective against Scab than either alone and is effective for Cedar Rusts. Iron carbamate is advised for controlling the Cedar Rust diseases, Brooks' Spot and Bitter Rot. A bloom application is usually necessary to obtain good control of the Cedar Rusts.

To avoid fruit russeting iron carbamate is preferred on Baldwin and Delicious. Do not use sulfur in combination with lead arsenate on these varieties. The use of lime sulfur, especially the liquid form, is injurious, particularly when used with lead arsenate and at temperatures above 85° F. Lime should be omitted in all sprays containing iron carbamate and Puratized. In sprays containing wettable sulfur or lime sulfur and lead arsenate the addition of the same amount of hydrated lime as lead arsenate tends to reduce arsenical injury. Use freshly hydrated 300 mesh high calcium (70% calcium oxide) lime.

To avoid objectionable residue Puratized should not be used after mid-June. For protection against Scab up to the early Cover sprays, it is the equal of wettable sulfurs or iron carbamate but is not effective for Cedar Rust control.

Eradicant Sprays For Burning Out Scab. Foliage Scab can be burned out reasonably well with liquid lime sulfur 2 gallons (or dry 8 lbs.) or Puratized, 1 pint. Unlike lime sulfur, Puratized eradicates Scab without causing foliage injury. It is usually necessary to apply eradicant sprays more heavily and more thoroughly than protective sprays.

Dusts. In many cases, dusting is desirable:

1. As emergency treatments between scheduled spray applications for Scab and Cedar Rust control.
2. When a water supply is limited or unavailable.
3. When immediate application is more important than delayed spraying.
4. To protect non-bearing trees from severe infestation.
5. To avoid excessive residue in applications just before harvest.

Desirable Dusting Formulae are:

Dusting Sulfur	Talc 85-Fermate 10-DDT 5
Sulfur 75-Lead Arsenate 25	Fermate 10-Lead Arsenate 25-Talc 65
Sulfur 95-DDT 5	Sulfur 85-Lead Arsenate 15
Sulfur 95-Fermate 5	Fermate 10-Talc 90

Either sulfur or iron carbamate dusts are desirable for controlling Scab. The sulfur-Fermate dust is satisfactory for controlling Scab and Cedar Rust; the Fermate-talc dust, for Scab, Cedar Rust, and fruit russet.

Miscellaneous. Benzene hexachloride, known as Gammexane, 666, Gamtex, BHC, and Benyhex, is a promising new insecticide especially for Curculio and Aphis control but must be studied more thoroughly before it can be generally recommended. Compatibility with lead arsenate, DDT and Fermate appears satisfactory, but with sulfur and dinitro materials it is questionable.

Phygon is highly effective against Scab but may cause leaf injury and reduction in size of fruit. It must be investigated further before it can be recommended. For limited, experimental use, the concentration should not exceed ½ pound of Phygon to 100 gallons of water. Phygon is compatible with lime but not with oils.

- - - - - - - - - - - - -

"Let's Look at That Map Again" In an orchard area along the Atlantic Seaboard the owner of a bulldozer contracted to remove a large block of apple trees. After pushing over 600 trees, he made a startling discovery. He was in the wrong orchard!

- - - - - - - - - - - - -

No January Fruit Notes. As a means of stretching a limited supply of mimeograph paper, and in line with a College policy during the past few months, a second issue of Fruit Notes has been omitted. From now on, however, we hope to get back on a monthly basis.

- - - - - - - - - - - - -

New Insecticide Gives Promise Against Mites. An organic compound, tetraethyl pyrophosphate (TEP), has been found to be unusually effective against certain pests which are quite unaffected by DDT. In laboratory tests TEP was 10 times as toxic against aphids as the usually applied nicotine compound. It may prove to be a useful material in controlling red mite. Tests indicate that it decomposes promptly and therefore does not leave a residue.

March 31, 1947

Prepared by the Fruit Program Committee of the Extension Service
W. H. Thies, Extension Horticulturist

Contents

SCAB SPORES ABNORMALLY EARLY

At this date (March 27), with apple buds still dormant, the development of scab ascospores in Massachusetts is as far advanced as it ordinarily is at the green-tip fruit bud stage. In the oldest perithecia mature spores are abundant. This situation emphasizes (1) the need to reduce the heavy scab carryover with a floor spray of dinitro and (2) the need for extra care in keeping susceptible varieties protected against scab, from early Pre-Pink onward.

O. C. Boyd

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.

RED RASPBERRY VARIETIES IN MASSACHUSETTS

Raspberry growing in Massachusetts has been severely hit in the past decade or two by a combination of virus diseases and adverse winter conditions. Black caps seldom survive more than three to five years and even reds are easily infected with virus since practically every sizeable patch of wild reds is infected with mosaic.

Interest in this state is almost entirely in the red raspberry, since it survives better than either blacks or purples and also because practically all the crop goes to the fresh fruit market. Cuthbert, which formerly was the chief commercial variety, is still recognized as about the best in eating quality. Latham, because of its superior winter hardiness and greater resistance to mosaic, has long since superseded Cuthbert as the leading commercial variety, but it has never taken the place of Cuthbert as a high quality dessert variety.

Among the newer varieties which are being tested at the Massachusetts State College the following are worthy of comment. They are listed approximately in order of season.

1. Sunrise is the earliest red raspberry being tested here. It ripens just ahead of Ranere. The fruit is a bit firmer and somewhat better quality than Chief. The plants are fairly winter hardy and moderately productive. Mosaic has been observed in the row but the plants have not been seriously injured by it so far. Because of its earliness it is being recommended for trial.

2. Indian Summer ripens its summer crop with Ranere, but of course is considerably larger and better quality than Ranere. However, it has not been so productive and the berries show too much tendency to crumble. The plants are fairly winter hardy, but production has not been good. In this section Indian Summer falls down in the characteristic for which it was named, since its fall crop usually is just starting to mature when the first hard freeze arrives. Hence, it is unreliable as an everbearer here.

3. Newburgh, in spite of its large, firm berry, has turned out to be entirely unsatisfactory because of its short growth and severe winter killing of canes.

4. Cayuga is a strong grower and of better than average winter hardiness. Some virus has appeared but in a limited test this variety has been very productive. Its fruit is larger and better than that of Chief.

5. Chief is the most winter hardy of all varieties tested so far. It has shown some virus disease, but is a good grower and productive. Unfortunately, its fruit is rather small and not particularly good quality, but it is probably the most reliable variety of its season.

6. Washington and Tahoma, which on the west coast are reported as being more winter hardy than Cuthbert, were both much more severely winter killed a year ago than was Cuthbert. Neither variety has shown

sufficient merit in fruit characters or productiveness in the past three years to warrant their further trial, although so far neither has shown any virus disease.

7. Taylor never has done as well here as at Geneva, N. Y. The plants are very susceptible to mosaic and leaf curl and are severely injured by these virus diseases. Rather heavy winter injury also has reduced the productiveness of this variety. It is not being recommended for further planting in this section.

8. Marcy, with its extra large, attractive, good quality fruit, should be of interest to the home gardener. However, it is one of the most severely winter injured varieties in our present planting and hence is of doubtful commercial value. This variety has shown no mosaic, but is particularly susceptible to leaf curl.

9. Latham, in spite of its position as the leading commercial variety, is not without faults. Mosaic cuts production in most plantings in the state, and the fruit is not so high quality as the market once enjoyed. Although usually quite winter hardy, spur blight occasionally causes serious cane killing in this variety.

10. Milton, which ripens with or just after Latham, was at first thought to be the answer to the maiden's prayer. It is a high quality, firm, attractive berry of good size and easily picked. The plants are vigorous and so far have shown no virus disease in plantings where mosaic and leaf curl are abundant on nearby varieties. However, in the past two winters, Milton has been considerably winter killed so that its production has been seriously cut.

So Massachusetts continues to search for that ideal red raspberry variety which will combine the productiveness and winter hardiness of Chief with the firmness and virus resistance of Milton, the size and color of Marcy, and the quality of Cuthbert, to mention a few of the chief requirements of such a variety.

A. P. French

ARE RICHARED APPLE TREES AVAILABLE?

We have recommended Richared for many years as the best of the red sports of Delicious for most conditions in Massachusetts. It appears that only two nurseries in the east now list Richared in their catalogs. Neither of these nurseries do much business in Massachusetts.

The name Richared is copyrighted by a Pacific Coast nursery which has leased propagation rights to other nurseries on a royalty basis. Several eastern nurseries leased the name but most of them have now ceased to do so. Nearly all nurseries offer a red sport of Delicious as "Double Red" Delicious or some similar name. Many red sports of Delicious have appeared from time to time, at least three of which have copyrighted names. The red sports offered by nurserymen may be one of these three, or some other sport never formally named. The differences between the various Delicious sports are

small but we feel they do exist. A grower will stand a good chance of getting a desirable type if he orders any one of the red sports.

J. K. Shaw

NO FROSTS IN THE GOOD OLD TIMES

The name Dr. Jabez Fisher means little to the present generation of fruit growers but it was well known 50 years ago when his writings appeared frequently in agricultural journals. He lectured on Vegetable Gardening at the State College in its early years and the cold storage building, Fisher Laboratory, was named for him. I visited him at his home in Fitchburg in 1913. He was over 90 years old, physically very infirm but mentally alert. I said to him, "I believe you were a member of the first class in the College." He replied, "No, that was my son." An old file yields a letter from Dr. Fisher dated June 4, 1913. In it he says, "I am about 600 feet above sea level, surrounded on three sides by lower land, and spring and autumn frosts are uncommon. I do not recall a total loss of any fruit crop in 58 years, from frost. Once a very cold N. E. storm prevented the fruits on the N. E. sides of apple trees from setting at all and ever since that time the two sides have alternated in bearing. This year gave the earliest date of the apple bloom in my record, May 8, but no frost with me though there was some in lower lands." Here is a well located orchard that seems to have escaped frost injury from 1855 to 1913. Recent years are the exception and not the rule.

J. K. Shaw

- - - - - - - -

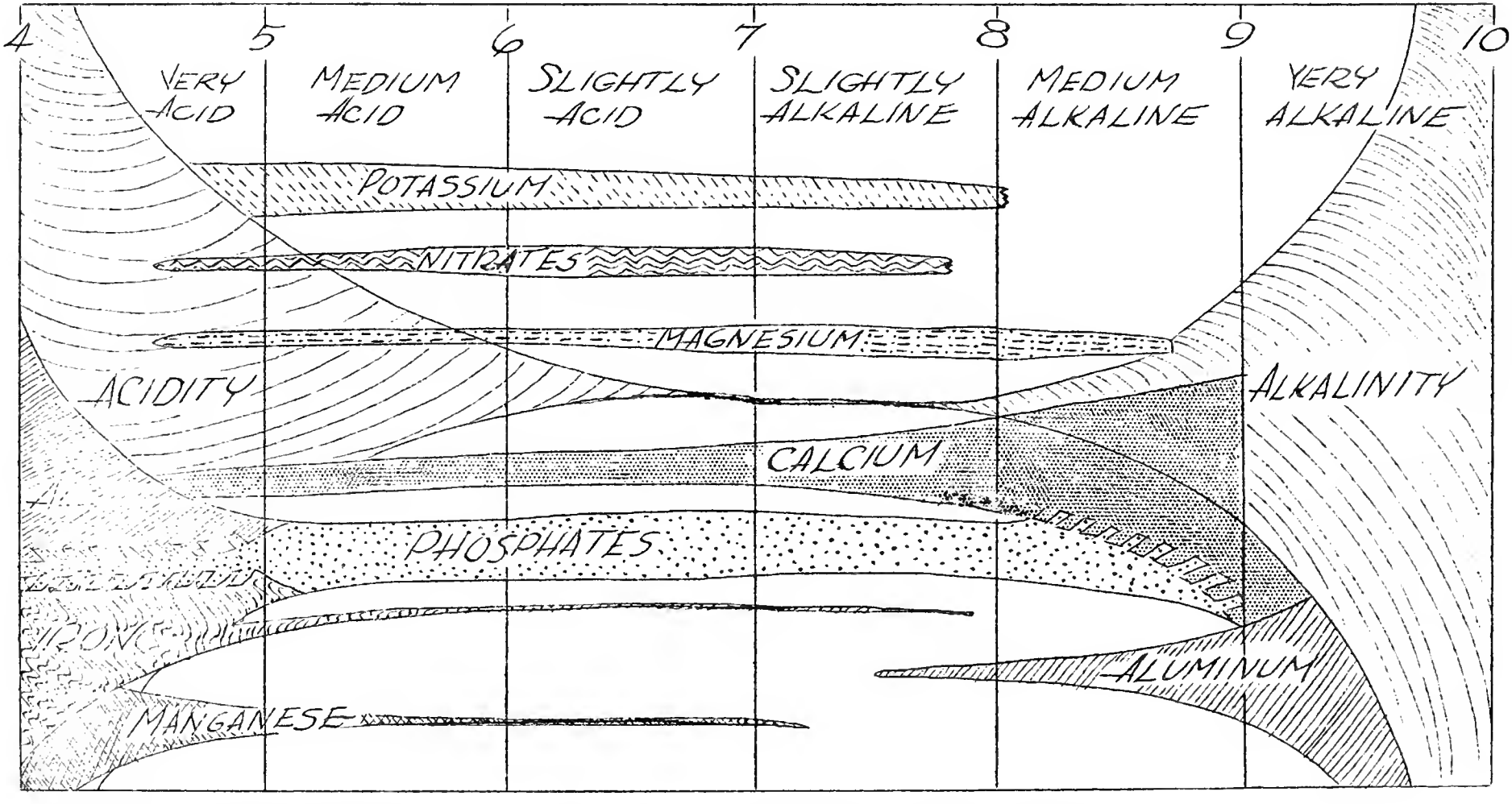
Twilight Meetings. A schedule of twilight orchard meetings to be held during the spraying season is now being arranged. As in years past, the details for each county will be announced through the County Extension office.

- - - - - - - - -

Fruit Notes Mailing List. During the next few months our mailing list will be completely revised. Any reader of Fruit Notes receiving a letter on this matter should return it promptly to insure continuance on the mailing list.

- - - - - - - - -

Have you received your 1947 Apple Spray Chart? If not, a copy may be obtained from your County Agricultural Agent or from the State College. The new 1947 Peach Spray Chart is also ready for distribution.



Relation of Soil Acidity (pH) to Availability of Mineral Elements. Width of individual bands (measured in a vertical direction) shows relative availability of that element at any given pH.

Examples: Below pH 5, nitrates are less available because nitrifying bacteria cannot work in a very acid soil. Below pH 5, phosphorus is likely to become tied up with aluminum or iron, in unavailable form. If an orchard soil becomes as acid as pH 5, an application of dolomitic or high magnesium lime is highly desirable, if not essential. Between pH 5.5 and 6.5 all of the various essential mineral elements are readily available. When we apply lime, with its content of magnesium and calcium, we not only add two essential elements but at the same time we provide a soil conditioner which helps to make other mineral elements available.

PROPERTIES AND USES OF FUNGICIDES ON FRUITS - 1947 (So many questions have been asked about the newer spray and dust materials that we are presenting, in this issue, a detailed statement on the newer Fungicides,- Elgetol, Krenite, Fermate, Karbam, Puratized, and Phygon, prepared by O. C. Boyd. In the next issue, another chapter covering the older materials,- Bordeaux Mixture, Wettable Sulfurs, Dusting Sulfur, and Lime-Sulfur will be presented.)

With the approach of an unusually hazardous season for controlling diseases of fruit crops in Massachusetts, due to an abnormally heavy carryover of disease organisms, it seems desirable to list the standard and some of the newer fungicidal spray materials, and indicate their outstanding properties and what appears to be their most appropriate uses on fruits in 1947.

ELGETOL, KRENITE

1. Physical, Chemical: Yellow organic dye in a slurry or thin paste emulsion, in 1-gal. cans; containing 34% of the sodium salt of dinitro ortho cresol.

2. Supply, plentiful. Cost, around $2.25 to $2.85 a gal.

3. Formulas: 1 1/2 to 2 qts. - 100 on dormant peach trees; 2 to 3 qts. 100 on apple and pear orchard floor; 4 qts. - 100 on raspberry canes and ground, and on floor of peach orchard and grape vineyard. At rate of 500-600 gals. per acre of ground on floor.

4. Properties: Aside from use as a strictly dormant tree spray to control aphids and bud moth on apples (2 qts.-100) and leaf curl on peaches (1 1/2 to 2 qts.-100), it is effective at delayed dormant time in killing the overwintering organisms for apple scab and pear scab (leaves on ground); raspberry spur blight (canes and old leaves); peach brown rot (mummies on ground), and grape black rot (leaves and mummies on ground). It is injurious to young green leaves and shoots of all of these plants except raspberry side shoots or fruiting laterals up to 1 inch in length.

5. Best Uses: (a) On floor of apple orchards with heavy carryover of scab (15-20% or more of old leaves scabbed) in order to reduce the danger of heavy primary scab infections and thus simplify control with the regular summer protective sprays. (See under 3 and 4 above for formula and time of application). Best results if applied at delayed dormant, although nearly as effective when applied in spring dormant season. Spray with trailing hose and brooms so as to wet all surface leaves on the orchard floor; using pressure not more than 350-400 lbs. Avoid disturbing the matted leaves and avoid hitting the tree tops if applied at delayed dormant. Should require 500 gals., better 600 gals. per acre.

(b) On raspberry canes and surrounding ground (4 qts.-100) when longest side shoots are one inch long to eradicate organisms of spur blight and probably anthracnose.

(c) On peach orchard and vineyard floor (see 3 and 4 above). First knock down or pick off and destroy all mummies hanging on peach trees and grape vines.

FERMATE, KARBAM

1. Physical, Chemical: Iron carbamate (Ferric dimethyl dithiocarbamate). A black, soot-like powder containing 70% active ingredients; forming true suspension in water.

2. Supply, moderate to plentiful for spraying; limited in dust formulations but dusts may be obtained on 2 to 3 weeks advance orders. For sources of these materials, contact the writer, Clark Hall, Massachusetts State College, Amherst, Mass.

3. Cost: 60 to 70¢ per pound.

4. Formulas: 1 1/2-100, full strength for spraying; 1/2 to 1-100 plus wettable sulfur 3 to 4-100 for mixed spray; 10-90 for full strength Fermate-talc dust, and 5-95 Fermate-sulfur dust.

5. Properties: At full strength, the equal of wettable sulfurs for apple and pear scab, and far more effective for control of cedar-apple and quince rusts, black rot, Brooks' fruit spot and bitter rot of apple. As mixed spray (see 4 above), effective against cedar rusts, and superior to full strength Fermate or sulfur for apple scab control. Is purely a protective spray. When combined full strength with lead arsenate in spray or dust, results in less fruit russet on Red Delicious, Baldwin and Pears than when sulfur-arsenate sprays or dusts are applied. May cause considerably more russet on Golden Delicious whether full or partial strength, than sulfur-arsenate sprays and dusts. Compatible with all standard materials except lime, copper and probably lime-sulfur.

6. Best Uses: (a) In standard schedule at full strength spray or dust (see 4 above) with lead arsenate on Baldwin, Delicious and pears, through second cover or throughout, for control of scab, black rot, rusts, fruit russet. (b) Fermate-sulfur mixture (see 4 above) spray or dust throughout season to control scab, black rot and rusts on scab-susceptible varieties other than Red Delicious, Baldwin and Golden Delicious. (c) Following sulfur or sulfur-Fermate mixture through first cover, use at 1 1/2 to 2-100 in later covers to control Brooks' fruit spot, bitter rot and scab. (d) At 2-100 to control spur blight and anthracnose on raspberries, first when oldest new canes are 12 inches high, and one or two additional sprays 12 to 14 days apart -- preferably with a spreader (containing no lime).

PURATIZED

1. Physical and Chemical: Five per cent solution of phenyl mecuri triethanol ammonium lactate, forming true solution in water.

2. Brand Name: Puratized Agricultural Spray.

3. Supply, moderate. Cost, around $1.40 - $1.50 a pint.

4. Concentration for spraying, 1 pt. - 100 gals.

5. Properties: Contains a bit of mercury and should not be used on apples beyond mid-June. Equal of dry wettable sulfurs for protection of fruits and foliage against apple scab and black rot, up to mid or late June only. Burns out scab spots on immature leaves nearly as well as liquid lime-sulfur and usually without appreciable injury. When combined with lead arsenate the spray sometimes causes spotting and yellowing of older leaves of apples, damage rather characteristic of arsenical injury. Not compatible with lime. Compatability with sulfur questionable. No better than sulfur for cedar-apple and quince-rust control.

6. Best Uses: (1) In first or second cover spray to eradicate scab from leaves. (2) If cost isn't a factor, in pink, calyx and first cover as both protectant and eradicant, with sulfur or sulfur plus Fermate in remainder. (3) In post-rain spray to head-off or prevent scab (but length of period for this "kick-back" action not definitely known). Use of spreader (but not a calcium caseinate) might improve it when used as an eradicant spray.

PHYGON

1. Physical, Chemical: A brownish-yellow powder containing 97% 2,3, dichloro-1, 4-naphthoquinone. Forms true suspension in water.

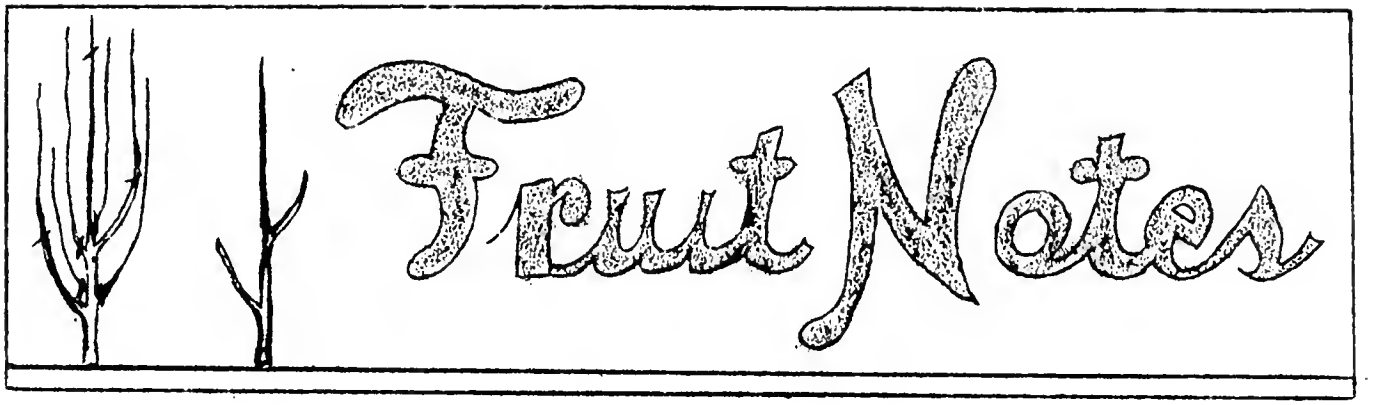
2. Supply, limited. Cost around $2.00 per lb.

3. Formulas: 3/4 to 1 lb.-100 is standard, although both concentrations may cause light to marked injury on apples.

4. Properties: Compatible with all standard summer spray materials except oils. Highly effective at 3/4-100 in preventing apple scab and black rot, but is only poor to moderate for burning out scab spots. At 1-100, effective against black rot and bitter rot of apples, and spur blight of raspberries (summer sprays on new canes - see under Fermate). Injury to apples includes dwarfing, yellowing and sometimes dropping of leaves, and spotting and reduction is size of fruits. The diluted spray is caustic to the hands and face of some operators.

5. Best Uses: (1) As alternative for Fermate on raspberries, at 1-100. (2) For small scale trial on apples for scab control; not stronger than 1/2 lb.-100, in pink, calyx and first cover spray using sulfur or Fermate and sulfur mixture (see under Fermate, 4) in pre-pink, bloom and later covers. (3) if cost is not important, use as in (2) except throughout the pre-pink to third cover spray inclusive followed by sulfur or sulfur-Fermate mixture in last cover.

O. C. Boyd



April 30, 1947

Prepared by the Fruit Program Committee of the Extension Service
W. H. Thies, Extension Horticulturist

Contents

FRUIT SCHOOL WELL ATTENDED

The Fruit School for commercial growers held at the State College March 31 - April 2 was attended by a total of 103 growers, extension agents and agricultural teachers. The two afternoon sessions devoted to tours of the tree and small fruits plantations were held under ideal weather conditions. About 25 veterans were included in the group several of whom were also present at the 1946 school. The attendance by counties was as follows: Barnstable, 2; Berkshire, 3; Bristol, 1; Essex, 4; Franklin, 10; Hampden, 23; Hampshire, 11; Middlesex, 13; Norfolk, 5; Plymouth, 1; Suffolk, 1; Worcester, 22; Out of State, 7.

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.

PROPERTIES AND USES OF FUNGICIDES ON FRUITS - 1947 (In the March issue of Fruit Notes there appeared a detailed statement concerning the newer fungicides. A similar statement covering the older fungicides is here presented).

BORDEAUX MIXTURE

1. Common Uses: Bordeaux mixture 8-8-100 (Copper sulfate-hydrated lime - water) is standard for diseases of grapes and strawberries; also for fall or spring dormant spray for peach leaf curl. If a fungicide is needed (it rarely is) at delayed dormant for apple scab control, Bordeaux may be combined with the oil spray for red mite. Bordeaux 2-6-100 is commonly used during mid-bloom (or when one-third of blossoms are open and again at three-fourths bloom) to prevent fire blight blossom infection in apples and pears.

2. Substitutes: (1) Any of the standard neutral copper fungicidal powders (for use as summer sprays) indicated above but perhaps with less effectiveness against diseases. Examples: basic copper sulfate (BasiCop, Tribasic); copper oxychloride (Copper A compound); copper oxychloride sulfate (COCS); and yellow copper oxide (Yellow Cuprocide). To equal the Bordeaux 8-8-100 formula, each material should be used in sufficient quantity to give 2 pounds of metallic copper to 100 gallons of water. Note: When the neutral coppers are used as summer sprays on grapes, apples, and pears, an equal amount of hydrated spray lime should be added in order to prevent copper injury to leaves and fruits. (2) Copper dusts are still less effective than neutral copper sprays for summer control.

WETTABLE SULFURS

1. Physical Characteristics: Both the dry wettable powders and paste sulfurs represent the solid, elemental form of sulfur. They form true suspensions in water.

2. Standard Uses: Standard summer fungicides for apple scab and black rot; for pear scab and leaf blights; and for brown rot of stone fruits and the leaf blights of plum and cherry.

3. Fungicidal Properties: Strictly preventative, not eradicative, when used on above crops. Would be eradicants if applied to red raspberry foliage infected with powdery mildew. Under weather and environmental conditions highly favorable for apple scab infections, paste sulfurs have given generally better control than dry wettable powders; and the finer particle sulfurs better control than coarser particle sulfurs.

4. Injury, Compatability: Wettable sulfurs may cause "sulfur scald" on apples and pears if present on the fruit during periods of high temperatures, particularly on the sun-exposed side of the tree. When combined with lead arsenate, they tend to increase the amount of arsenical injury on apple foliage and fruit (calyx-end blackening) if a corrective agent such as lime or zinc sulfate and lime is not added. Use of combined wettable

sulfur-lead arsenate sprays is likely to result in marked fruit russet on Red Delicious and Baldwin, and lime is not a reliable corrective for this injury. Sulfur sprays and dusts are injurious to grape foliage, and they are ineffective against the rust diseases as well as Brooks' fruit spot and bitter rot of apple and quince.

5. Best Use on Apples: As a protective spray for scab control, applied before or during infection rains, in the pre-blossom, blossom, and post-blossom sprays; on all scab-susceptible varieties except those subject to fruit spray russet. The protective value of sulfur against apple scab is increased when sulfur is combined with Formate.

DUSTING SULFUR

1. Properties: As a rule sulfur dusts are not as effective for protecting fruit crop against diseases as an equal number of applications of wettable sulfur sprays, principally because dust deposits adhere less well to foliage and fruits than spray deposits, even when dusts are applied to damp trees. Dusting damp plants results in heavier initial deposit and a longer lasting residue than dusting dry plants, but the sulfur deposit on dry leaves and fruits may be more evenly distributed. When applied to apples and peaches, sulfur-lead arsenate dusts usually result in less sulfur and arsenical injuries than sulfur-lead arsenate sprays, particularly on peaches.

2. Best Use: An all-dusting program is likely to give more satisfactory control of peach diseases than apple scab especially in McIntosh and other highly susceptible apple varieties. On such varieties, dusting is best considered a supplement to spraying, that is, to insure prompt protection ahead of or during a rain period; also at a time when soil conditions make it difficult to transport a heavy spray rig through the orchard; and for a quick "once-over" around mid-bloom. Once apple scab is under good control and the period for primary infection is past, dusting might be considered "standard" for the remainder of the season. One "best place" for sulfur dusting is on peaches prior to and during the picking season to control brown rot, with the least amount of fungicidal residue on the fruit.

LIME SULFUR

1. Common Uses: Lime-sulfur remains a standard fall or spring dormant spray for the control of peach leaf curl, 7-100 of liquid or 18-100 of dry lime-sulfur. It likewise is commonly used as a delayed dormant spray (10 gal.-100 gal.) and pre-blossom spray (2-100) on red raspberries for control of anthracnose. As a summer spray on apples (2 gal.-100 gal.) it is more effective against scab and black rot than the best wettable sulfurs, but it is considered too injurious to be used other than as an emergency spray.

2. Properties: The elemental sulfur deposit resulting from the soluble sulfurs in the lime-sulfur spray is considered superior to the deposits of wettable sulfurs in withstanding weathering -- in other words, more adherent. Lime-sulfur is far more injurious to foliage and fruits of

orchard crops than any of the wettable sulfurs, due to direct absorption of the suluble thiosulfates and polysulfide from the undried spray film. When lime-sulfur, liquid or dry, is used several times a year, and year after year, tree growth is stunted and yields fall off rapidly.

In addition to its highly effective protective action against apple scab, lime-sulfur is also eradicative, killing out the fungus in leaf spots, but not in fruit spots. It is also effective in preventing scab infections when applied as long as 50 to 70 hours after the beginning of the infection rain. Four pounds of dry lime-sulfur contain approximately the same amount of total sulfur as 1 gallon of 32° Baumé liquid, but less of the caustic, soluble forms of sulfur. Hence dry lime-sulfur 8 lbs. - 100 is a weaker eradicant fungicide and somewhat safer as regard plant injury than liquid lime-sulfur 2 gal.-100.

3. Best Use on Apples: Once or twice during the season, if needed, as an emergency spray, (1) applied after an infection rain to an orchard that was unprotected before and during the rain, for the purpose of heading-off or preventing infection; (2) in a cover spray to burn out scab spots on the foliage, in case a safer eradicant is not available.

O. C. Boyd

- - - - - - - - -

GETTING ALONG WITHOUT IRON CARBAMATE

Due to the extreme shortage of iron carbamate this spring many apple growers who intended to use Fermate or Karbam will be disappointed. A few were fortunate to carry over or to purchase early in the winter a supply only while others are likely not to obtain any at all. The following are suggestions for courses that might be followed where (1) a limited supply of iron carbamate is on hand, and (2) where none is obtainable.

For Limited Supply of Iron Carbamate. Use it either (1) on rust-susceptible varieties such as Wealthy, Rome, Delicious, Cortland, Twenty Ounce, or (2) on Delicious and Baldwin to reduce fruit russet, or (3) for Brooks' spot control in Wagener, Delicious, Baldwin, etc. For rust control, use at partial strength (½ lb.-100 plus half-concentration of sulfur) except on Delicious use 1 lb.-100 -- at pink, mid-bloom, calyx and first cover. For russet control, 1 ½ - 100 without sulfur is suggested through the second cover spray, followed by sulfur in later covers. For Brooks' spot and bitter rot control, use 1½ to 2-100 in the second, third and fourth covers following an earlier program of sulfur or other fungicide.

Last preference for a limited supply would be for scab control in McIntosh and other highly susceptible varieties -- at ½ to 3/4 lb.-100 plus half-strength wettable sulfur, notably in the early sprays up to and including the first cover. It is impossible to replace iron carbamate for control of cedar-apple and quince rusts, and difficult to make a substitution for controlling fruit russet, Brooks' spot and bitter rot. However,

good control of scab may be obtained without it, just as has been done in many past seasons.

Where No Iron Carbamate is Available. To reduce fruit russet in Baldwin and Delicious, use preferably a wettable sulfur, or Puratized, alone in the pre-blossom, bloom and calyx sprays. If lead arsenate is necessary in the pink or calyx sprays, then add as much hydrated spray lime as lead arsenate to the spray mixture. In the first and second covers, give preferance to Puratized and lead, otherwise use the sulfur-lead-lime mixture. For later covers, adhere to the standard fungicide - insecticide program indicated in the printed spray chart.

In the absence of Fermate or Karbam, rusts of apple may be reduced slightly by the usual sulfur program provided one or two applications are made during bloom. It is mandatory that the fungicide be on the trees shortly before or during the infection rain.

In orchards where Brooks' spot or bitter rot is a problem, iron carbamate may be replaced by Bordeaux 2-6-100 in the second cover and by 4-8-100 in the third and fourth covers -- or by neutral copper fungicidal powders to give $\frac{1}{2}$ lb. and 1 lb., respectively, of metallic copper to 100 gals. In the last instance, add as much spray lime as neutral copper fungicide.

O. C. Boyd

SPUR BLIGHT IN RASPBERRY VARIETIES

Spur blight is the most destructive cane disease of red raspberries in Massachusetts. The past two seasons were highly favorable for its development in susceptible varieties. The following indicates the relative amounts of the disease observed on April 17 in the College variety plots.

None: Ohta, Ranier, Sunrise.
Very Light: Cuthbert, Chief, June, Lloyd George, Milton, Newburg, Viking, Washington.
Light: Marcy, Tahoma, Indian Summer.
Moderate: Taylor.
Severe: Latham, Cayuga.
Very severe: Tennessee Autumn.

O. C. Boyd

A Plum Puzzle: At the Flower Show in Boston a lady stopped at the horticultural information booth to inquire about a plum tree which had died and had later sprouted up from the lower part of the trunk. "But now", she said, "I have a peach tree instead of a plum tree". The explanation is that some nurserymen propagate part of their plum trees on peach seedlings presumably to get a better root system on a sandy soil.

THE IMPROVEMENT OF WILD HIGHBUSH BLUEBERRIES

There are many acres of wild highbush blueberries in this state where the bushes are yielding much below their capacity because of lack of care. They can be made to double or triple their yield without great expense or labor.

In 1928 experiments were tried on blueberry land in Hubbardston, Royalston, Westminster, Ashburnham, and Barre, Massachusetts, to increase the yield of wild bushes. The treatments were as follows: (1) all large trees and second growth shading the blueberries were removed, (2) the bushes were pruned, (3) fertilizer was applied. The pruning varied from removing a quarter of the bush to cutting it wholly to the ground. The fertilizers used were: nitrate of soda, ammonium sulfate, urea, calurea, cyanamid, 4-8-4, and nitrophoska. Different combinations of fertilizers and pruning were tried.

The following results were observed:

1. Removal of other vegetation increased the growth of the blueberry bushes.

2. Pruning, where not excessive, increased growth and yield. Removal of more than a quarter of the bush was too severe. Bushes cut to the ground yielded a few berries the third year there after but produced no commercial crop till the fourth year.

3. Fertilization increased the growth and yield of the bushes. The increase seemed to be due to nitrogen rather than to any other fertilizer element.

4. A combination of fertilization and pruning was much better than either alone.

5. The increase in production on the fertilized plots was due mostly to an increase in the number of berries per bush. It was impossible to obtain satisfactory comparative yield records under the conditions of the experiments. The bushes varied in size and number per acre. Although the pickers were assigned to different parts of the field, they picked in the fertilized plots whenever possible, with or without permission. This is very good evidence of the better picking found there.

6. The berries on the fertilized plots tended to be larger, but the size of wild berries varies greatly and cannot be increased beyond limits set by inheritance.

7. Fertilized bushes had a marked tendency to bear yearly; unfertilized bushes to bear in alternate years.

8. The berries on the fertilized plots were firmer during dry periods than those on unfertilized areas.

9. A terminal shoot growth of about ten inches was best. Any increase in length up to ten inches increased yield. Longer shoots were apt to be too vegetative for maximum production.

These observations are the basis for the following improvement program:

First, remove all trees and bushes shading the blueberries. This will often supply the winter's wood, thus making the labor serve a double purpose. If valuable timber trees are present, the owner must choose between blueberries and timber. The mowing of low bushes growing with the blueberries helps also.

Second, prune the blueberry bushes in winter or early spring before growth starts. Take out all dead wood first, then some of the oldest stems, cutting them off four or five inches from the ground. This can be done best with long-handled lopping shears.

Third, fertilize the bushes. Apply 200 pounds of nitrate of soda per acre, or some other nitrogenous fertilizer at a rate to give a like amount of nitrogen.

Fourth, select and tag the more productive bushes and give them special care.

J. S. Bailey

- - - - - - - -

Again Those "Ready to Bear" Trees It appears that some folks are unduly influenced by clever advertising. The term "Ready to Bear", for example, brings to mind the impossible situation in which a fruit tree bears a full crop the first season. By making such absurd claims the nurseryman is able to get rid of older trees which he didn't happen to sell at the proper age. True, the tree may have fruit buds, but what about the roots? Any fruit plant, whether tree or small fruit, should take the first season, or more, to develop a good root system and make the vegetative growth which always accompanies good production. The apple or two which a young tree bears the first year is much less important than the bushel it bears at 8 years of age. And the handful of raspberries on a newly planted cane, not cut back, is borne at the expense of the vigorous canes which might be growing in preparation for next year's crop.

- - - - - - - - - - -

Tale of Two Orchards One day last week we came across two orchards which may be worth noting here. They are examples of the strange things being done under the guise of pest control. In the first orchard, the owner was breezing alongside the orchard at about 5 miles

per hour waving a wide open gun in a manner reminiscent of an orchestra leader. At a distance it looked as if he might be covering a third of the tree. In the second orchard, the owner had cut off the tops of his trees in the hope that it would facilitate his pest control. The upright tilt of all the branches in these 20-year-old trees showed that they had never borne much fruit. On inquiry we found that he had gone through the motions of spraying 3 times last year, that he had applied 3 gallons of material on McIntosh trees which should have 10, and that the leaves dropped very early. Incidentally, in spite of a good soil the trees will bloom very lightly this spring possibly because of early defoliation.

- - - - - - - - -

TIPS FROM THE MEN WHO SELL THEM

Two extension schools have been held for the purpose of helping storekeepers to improve the handling of fruits and vegetables. One school was held in Fall River and the other in Greenfield. The school consisted of a series of five meetings with one meeting being held each week. At each meeting some phase of merchandising fruits and vegetables was discussed. It has been the privilege of the writer to present the subject of fruit handling at each of the schools. A few significant complaints were expressed at each of these schools by the storekeepers.

1. The storekeepers in Fall River are forced to use out-of-state apples because of a lack of native fruit.

2. The storekeepers in Greenfield complain that they were unable to get good hand picked McIntosh in the fall. The only McIntosh they could get were drops and they could sell a lot of good McIntosh if they could get them. They also wish that they could get more pears as there is a good market which they are unable to supply. When asked about grapes, they all agreed that they are unable to get nearly enough local grapes to supply the demand. One merchant told of buying out-of-state grapes in bulk and then putting them up in two quart till baskets. He said that he sold them almost as fast as he could put them up, and could have sold a great many more if he had had them.

O. C . Roberts

POLLINATION OF FRUITS IN NEW ENGLAND

Apples: Probably all varieties of apples produce higher yields when cross-pollinated although Baldwin sets profitable crops when planted alone. Good Pollenizers: Early Blooming - Red Astrachan, Oldenburg, McIntosh, Fameuse, Wagener, Yellow Transparent, Midseason Blooming - Wealthy, Delicious (Starking, Richared), Golden Delicious, Wolf River, Cortland,

Ben Davis, Winter Banana, Early McIntosh, Late Blooming - Northern Spy, Rome, Gallia, N. W. Greening, Macoun.

In general, any two of these varieties will pollonize each other satisfactorily when their blooming seasons overlap. Early and midseason bloom overlap satisfactorily in New England; also midseason and late bloom. Delicious and its red sports are particularly good pollenizers. However, all varieties are crossincompatible with their own red sports, and the Cortland-Early McIntosh combination is not sufficiently fruitful.

Poor Pollenizers (Triploid varieties): Baldwin, R. I. Greening, Gravenstein, King, Roxbury Russet, Stark, Stayman, Mammoth Black Twig.

These should not be depended upon for pollenizing purposes. Any good pollenizer will cross-fertilize these varieties if the periods of bloom overlap. Northern Spy is not very attractive to bees and needs pollenizers close to it.

Pears: Varieties of pears are, in general, self-unfruitful. Cross-pollination should be provided. Bartlett and Seckel apparently will not pollenize each other under some conditions. There is little evidence of cross-incompatibility among other common varieties. Usually the blooming seasons overlap enough to provide cross-pollination but the following list may help to match blooming periods more closely. Early Blooming: Anjou, Kieffer, Howell, Duchess, Midseason Blooming; Bosc, Bartlett, Clapp Favorite, Seckel, Gorham, Late Blooming: Winter Nelis, Wilder.

Peaches: Most of the common varieties of peaches are self-fruitful. Among the exceptions are J. H. Hale, Mikado or June Elberta, and Pacemaker, which require cross-pollination. Also Greensboro and Belle of Georgia have been reported as more productive when cross-pollinated. As far as is known any other common commercial variety will pollenize these.

Plums: All Japanese plums may be considered self-unfruitful. Most varieties pollenize each other freely but at least one common variety, Formosa, has poor pollen. European plums pollenize Japanese varieties to a limited extent. A few European plums are self-fruitful (Stanley, Monarch, Yellow Egg, Damsons). Many are only partly self-fruitful. It is advisable to plant at least two varieties together. Japanese plums are not good pollenizers for European sorts.

Cherries: All sweet cherry varieties require cross-pollination. Bing, Lambert, Napoleon, and Emperor Francis will not fertilize each other but each may be fertilized by other common varieties. Common varieties of sour cherries are self-fruitful.

Grapes: Common varieties of grapes are self-fruitful except Brighton and Erie, which need cross-pollination.

Strawberries: A few varieties of strawberries with "imperfect" flowers require cross pollination. Examples are Howard Supreme, Sample, and Warfield. Imperfect varieties are rarely planted. All common varieties are self-fruitful.

Raspberries, Blackberries, Dewberries: Varieties of bramble fruits grown in Massachusetts are all self-fruitful.

Blueberries: Blueberries require cross-pollination for maximum crops. As far as is known, any two varieties are cross-fruitful.

R. A. Van Meter

- - - - - - - - - -

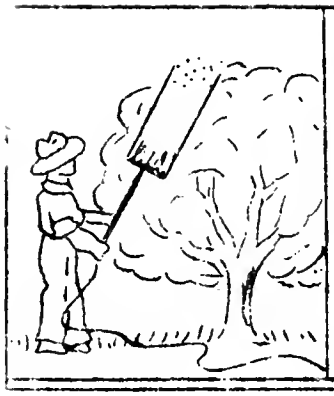
LET'S PLAY SAFE Farming is a dangerous occupation. The orchard business is no exception. Whether we drive a tractor or climb a ladder, danger is always present. A recent tragic accident in which a life was lost in the Nashoba area while using an airplane in spraying an orchard emphasizes once more the hazards in agriculture. Several years ago a grower was practically blinded for weeks after getting a shot of caustic spray material in his eyes. We can't be on guard continually against such unusual mishaps. But we must take every precaution to safeguard ourselves, our workmen and our property against ordinary dangers. To mention just a few: Tipping of tractor or spray rig by driving on steep slopes or over obstructions. Cranking a tractor while in gear. Leaving poisonous materials where they may be picked up by children or livestock. Careless use of fire around inflammable materials. Let's take time to check on the danger spots in our fruit farm setup, even though we are a little later getting on the job.

- - - - - - - - - -

REPORT ON TWO SOIL SAMPLES While making a trip with a class recently the question of the soil and the plants which grow on it was brought up. On one small area we found a scanty assortment of plants including sorrel, dewberries, etc. A sample of the soil was taken (No. 1) and the group guessed that it would be fairly acid. On another area there was a luxuriant growth of grasses amounting to at least 2½ tons of hay per acre. Here a second sample (No. 2) was taken. Holes 3 feet deep were also dug at the points of sampling. No. 1 was very gravelly, showing a thin layer of surface soil and very little clay or silt. No. 2 showed a dark colored surface layer at least 10 inches thick an almost uniformly brown color from top to bottom and considerable clay and silt. The analyses given below, show a wide difference in acidity and, with the exception of Phosphorus which is seldom a limiting factor, No. 2 shows an interesting relation between available mineral elements and plant growth.

	pH	Ca	Mg	N	P	K
No. 1	5.3	M	M	VL	VH	VL
No. 2	6.7	MH	H	L	H	MH

(H-High; M-Medium; L-Low; VL-Very Low)



Fruit Notes

May 29, 1947

Prepared by the Fruit Program Committee of the Extension Service
W. H. Thies, Extension Horticulturist

Contents

DOLLARS AND SENSE

Farm and home safety has become a year 'round business. The only trouble is that too few people make it their business. Last year more than four thousand farmers lost their lives in farm accidents, and thousands more were badly injured.

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

Agriculture has become our most hazardous industry, according to the National Safety Council. Farm accidents, in their order of occurence, are due to falls, machinery, livestock and miscellaneous.

The National Safety Council reveals that every fifteen minutes fires break out on American farms. Over a ten year period a billion dollars in farm property have gone up in smoke. All this is largely a result of carelessness and forgetfulness.

How many times on a fruit farm has a carelessly set fire swept through dry grass to destroy trees and endanger buildings. Even an incinerator fire got out of control on one farm recently, with disastrous results to a young orchard nearby. A moment of carelessness while driving a tractor on a steep grade cost the life of one fruit grower, while an exploding gas tank caused serious burns to a bulldozer operator in one case and a ruined sprayer in another.

One fruit grower suffered a wrenched back when a rickety step in a storage cellar gave way. Another escaped serious injury by an eyelash as he descended some unlighted and unguarded steps in a packing house. Although we have few fractious bulls on fruit farms, danger in one form or another lurks just around the next tree. We can save ourselves much lost time and inconvenience by taking all of the ordinary precautions and by constantly putting safety ahead of speed.

Many accidents can be avoided by observing the simple rule "A place for everything and everything in its place." It all boils down to this simple observation--it costs money to prevent accidents, but it costs much more to let them happen!

- - - - - - - - -

Announcing the new "Red Apple Club". A new contest, sponsored by the M. F. G. A., will focus attention on 3 important items in the apple business, -- (1) pest control, (2) color, and (3) yield. This project has been arranged at the request of a number of growers and is patterned after the 90% Clean Apple Club which was conducted with much success from 1929 to 1933. Any grower in Massachusetts with an apple orchard of 5 acres or more is eligible. The requirements are as follows:

1. That the crop be at least 90% free of insect and disease blemishes.
2. That the crop amount to at least -
   200 bushels per acre on 10 to 14 year old trees
   300 bushels per acre on 15 to 19 year old trees
   400 bushels per acre on trees 20 years or older
3. That the crop grade at least 60% U. S. Fancy
4. That successful contestants each show a packed bushel from the inspected block at the annual meeting of the M. F. G. A. in January.

The final inspection will be made on a carefully taken sample of not less than 5 bushels from a particular block of trees of not less than one acre, the sample to be picked under the direction of the County Agricultural Agent or his representative.

Any apple grower wishing to take part in this contest should keep a simple record of his spray or dust schedule. Application for inspection must be made not later than August 1, 1947 to the County Agricultural Agent of the County in which the orchard is located. It will be very gratifying if 10 blocks of trees in Massachusetts can measure up the high standards outlined above.

- - - - - - - -

SPLASHING RAINDROPS AND SOIL EROSION

Soil erosion by water is generally applied to the process of soil being carried away or transported by excess water running overland. According to Dr. W. D. Ellison of the Soil Conservation Service, this statement is only partly correct. He has done considerable research work with the effects of raindrops on soil erosion and has come to some very definite conclusions regarding the physical mechanism which takes place when water erodes soil. Particles of soil before they can be moved or transported by flowing water have to be detached from the soil mass. "The resistance to detachment of particles from the soil mass will depend mainly on the soil's cohesive properties". A soil high in clay content has strong cohesive properties and may not be easily disturbed by surface flowing water because the soil particles resist separation. On the other hand, once the fine clay particles are detached they remain in suspension and are then very easily transported.

Dr. Ellison's work shows that the pelting raindrops speed up this detachment process and thus accelerate the rate of soil erosion. During a hard rainfall, soil particles may be splashed as high as two feet into the air by the force of the falling drops. The splashed particles never fall back to the same spot. On sloping land their tendency is to splash more downhill than uphill. The amount of soil lost in this way has been found to be tremendous. Spring time is the worst season. Usually the raindrops during the spring showers are large and come down with great hitting power. Fertile, loamy soils, when bare, are damaged the most and are the greatest sufferers.

The particle detaching power of the splashing raindrop is greatly, if not entirely reduced by the leaf surfaces of the growing crops. Any vegetation which will reduce the force of the impact of raindrops on soil will reduce erosion. Hayfields, pastures and orchards in sod or mulch, therefore, give some of the best control against raindrop erosion. It is, however, during the spring time when the seedbed is being prepared and while the crops are still small that the rains have their most detrimental effect on cultivated land.

Karol J. Kucinski
Project Supervisor, SCS Research

Some Observations of the Apple Business in California. (The following interesting items concerning the Watsonville, California area are submitted by H. P. Silmore of Westboro).

Varieties - Santa Cruz County has about 9,235 acres of bearing apples of which 5,896 acres are Newtown, 1,916 Delicious, 1,323, Bellefleur, which is declining. The district is irrigated from wells. The Delicious can be grown in the hills, they are not suitable for the rich soil on the valley floor. Newton is a heavy producer -- certain blocks averaged well above 800 picked boxes to the acre, and the whole district, with lighter bearing Delicious included, has averaged 700 bushels to the acre. The present crop promises a record.

Collection of Bloom - In Watsonville the Newtown is self-fertile. Thinning of the blooms to one to a cluster is practiced. Collectors of pollen do the work free. The pollen when dried sells at $55.00 an ounce for hard pollination in districts further north. Pruning is carefully done to a system.

Storage Facilities - The storage of Newtown is so important that storage facilities are highly developed. Facilities in use include: brine for cooling and forced draft in building, one floor high, rooms not over 60 feet wide, boxes stored 20 high, with the growing use of so-called "palats" holding 24 (6 high) or 28 (7 high) boxes, placed in position by a towmaster or similar machine. The lower tier is 6 high, second tier 7, upper tier 6, furnishing air spaces at each level. The boxes are easily moved, with no jar to the fruit when placed in storage and when taken out, in marked contrast to hand piling.

Insulation - Ferro-therm is coming into use. Five sheets of steel stapled on 1" furring, with open spaces running from floor to roof are used for insulation instead of cork in new construction. Ferro-therm is fire-proof, light, easily handled, vermin proof, cheaper than cork and promises long life, as well as being an excellent insulator.

Movement of Fruit to Storage - One of the well equipped orchards had 7 rubber tired, low-wheeled flat trucks, and two tractors. All boxes are hauled out on palats and left on the truck. A truck stands between 4 trees; as boxes are filled they are placed on the palat on the truck by the pickers, who are on day wage to assure care in handling, and as soon as loaded the truck is hauled to storage. All empty boxes are stored on palats for ease in handling. Seven trucks with two tractors can haul in a 50,000 to 70,000 box crop in the season of harvest.

- - - - - - - - - - - - -

WORCESTER COUNTY FIELD DAY

FRED KINGDON FARM

WEST MILLBURY

Demonstration of Latest Spraying and Dusting Equipment

EFFECT OF FUNGICIDE ON YIELD - (E. J. Rasmussen of the University of New Hampshire presents the following data as further evidence that the continued use of lime sulfur reduces the yield of an apple orchard).

A plot of 19-year-old Northern Spy trees at the Graham Station in Michigan which had previously been sprayed for a number of years with lime sulfur and which was erratic in bearing, sometimes bearing only once in three years, was divided into three plots. One plot was sprayed with lime sulfur, another with a wettable sulfur and the third with a proprietary copper compound. These plots received the same treatment for 5 years, 1939-1944.

The average annual yield for the 5 year period on the lime sulfur plot was 442 bushels, on the wettable sulfur plot, 568 bushels, and on the copper sprayed plot 678 bushels. The yield was closely related to the amount of foliage on the trees. About September 1 the lime sulfur sprayed trees averaged 474 leaves per 100 spurs, the wettable sulfur sprayed trees, 603, and the copper sprayed trees, 643 leaves per 100 spurs.

The increase in yield on the plots sprayed with a mild sulfur, wettable sulfur, was 28 to 55% more than on the lime sulfur sprayed plot. The copper sprays caused considerable russet on the fruit when used in an all season spray program, and would not be satisfactory where fruit was grown for the fresh fruit market. The information emphasizes the importance of testing pest control materials for purposes other than for disease and insect control.

- - - - - - - -

Another Spider Invades Massachusetts Orchards. The common red spider has recently been found in several Middlesex County orchards. On infested trees, it is usually more abundant than the European red mite. This pest has frequently been reported on apple trees in Virginia and New York, but has not been observed in large numbers on apples in Massachusetts before this spring.

The common red spider spends the winter as an adult in mulch or similar protection. During cool spring weather they migrate to the warmer, sunny places and may go into trees. They feed on a great variety of plants and during the summer are more abundant on such plants as clover, alfalfa and chickweed. We do not anticipate any significant damage from them but suggest spraying with DN-111 in mid-June, if necessary.

W. D. Whitcomb

- - - - - - - -

TIMING OF EARLY SPRAY APPLICATIONS COMPARED

Insect development, unlike scab and other diseases which thrive in cool, wet weather, is dependent on temperature and usually keeps pace with tree growth.

Cool, wet weather in early May has held the orchard insects in the background. Many aphids have hatched and most of them have been killed by cold weather. European red mite will hatch during the pink bud stage and will not multiply rapidly except in a period of warm weather. Where dormant or delayed dormant applications of oil have been applied this year, red mite should not be troublesome until late July or early August, if at all.

Many growers are concerned about the slow tree development this spring but it is not unusual. The history of our spraying operations at Waltham shows that 1947 has started about like 1940 and 1943. Therefore, we can assume that many of the pest problems, and perhaps the crop prospects in your orchard can be compared with these years. If you have kept a spray record or diary, why not look at it?

Record of spray applications at the Waltham Field Station:

YEAR	PRE-PINK	PINK	BLOOM	CALYX
1940	May 8	May 16	May 20-24	May 28-29
1941	April 23	May 1	May 8	May 15
1942	April 27	May 3	May 7-8	May 13
1943	May 6	May 13	May 18-20	May 25
1944	May 4	May 9	May 13	May 17-20
1945	April 11	April 16	April 18	April 26
1946	April 18	April 30	May 15	May 20
1947	May 6	?	?	?

W. D. Whitcomb

ERADICATING APPLE SCAB

With McIntosh fruit spurs almost as a standstill bordering late delayed dormant and early pre-pink, yet with scab perethecia freely discharging primary spores during the long cold, wet period, growers are obviously curious to learn how protectant fungicidal applications have succeeded.

No doubt there will be many disappointments and much evident foliage scab before calyx to require special eradicant sprays to control the disease. The battle with protectant fungicides to control primary scab infections must continue until mid-June or thereabouts. In the meantime, careful observations should be made for the first signs of primary foliage scab infections. There should be evidence of primary scab sometime around May 15 - 20. This may be during bloom because scab is early and tree development is late this year. No grower can afford to let scab

devastate his orchard in the face of a good crop of apples.

Liquid lime sulfur 2 gallons and Puratized Agricultural Spray 1 pint in 100 gallons of water are considered the best scab eradicant fungicides. Last year at Waltham, Wealthy trees in full bloom were sprayed twice with Puratized (applications one week apart) with no harmful results. Liquid lime sulfur is toxic to apple pollen and should not be used when the trees are in full bloom. The scab eradicant applications can be applied if necessary late in the blooming period without harm. Some foliage injury from liquid lime sulfur can be expected.

Eradication of scab is best accomplished when the primary scab mold is young and with two applications about 7-10 days apart. The sprays should be applied in drying weather. Unless scab infections are cleared up as they first appear, the ultimate result is likely to be more scab.

E. F. Guba

- - - - - - - - -

KILLING WITCH GRASS BY SPRAYING

Witch grass is such a common and persistent pest in orchards where cultivation is practiced that it is almost accepted, like death and taxes, as inevitable. Its elimination by cultivation is possible but the amount of work and expense involved is so great that as far as orchards are concerned it is seldom "licked". With labor scarce and high priced, some other method for combating this pest is desirable.

Spraying is rapid and easy. Every fruit grower has spraying equipment and is familiar with its use. A spraying method for killing witch grass seems logical and desirable. Last summer a series of plots, thickly covered with witch grass, were sprayed with Ammate or with Atlacide, a commercial weed killer containing sodium chlorate and a deflagration agent. (Sodium chlorate is inflammable, and becomes extremely so in contact with dry organic matter. It should be used with great care unless mixed with some chemical called a deflagration agent to reduce the fire hazard.) The sprays were applied on several different dates, at different concentrations, and at different amounts per 100 square feet. It was found that both sprays were most effective when applied about October 1. At this time either Ammate applied at 3/4 pounds per gallon and 1 gallon per 100 square feet or Atlacide applied at 1½ pounds per gallon and 1 gallon per 100 square feet, gave practically 100 per cent kill to witch grass.

Ammate up to 1 pound per gallon is safe to use around apple trees after they are three years old. Preliminary experiments indicate that the same is true for pears, plums and cherries. On the other hand, this material is very toxic to peaches and blueberries and should not be used around these fruits. Since Ammate is very corrosive on metals, any equipment in which this spray is used should be thoroughly washed with water containing baking soda or spray lime immediately following use.

Atlacide appears to be safe around apple, pear, plum and cherry trees three years old or older, providing not more than 1 1/4 pound per gallon and not more than 1 gallon per 100 square feet is used. This spray is toxic to blueberries.

Some of the advantages and disadvantages of these two sprays are: AMMATE - Advantages -(1) Highly effective, (2) Readily soluble, (3) No fire hazard, (4) Non-toxic to animals, (5) Rapid breakdown in soil. Disadvantages - (1) Corrosive action, (2) Higher cost. ATLACIDE - Advantages - (1) Highly effective, (2) Lower cost, (3) No corrosive action. Disadvantages - (1) Less soluble, (2) Fire hazard, (3) Slightly toxic to animals, (4) Slow breakdown in soil.

It should be remembered that neither of these materials is selective. They will kill practically all vegetation with which they come in contact.

The relative costs of these materials is as follows:

	Price per lb.	lbs. per gal. of spray	Gal. per 100 sq. ft.	Cost per A.
Ammate	18¢	3/4	1	$58.81
Atlacide	9.5¢	1 1/4	1	51.84

Although the per acre cost of these materials is high, their effectiveness and the ease and rapidity with which the spray can be applied seems to justify their use. Where it is desired to keep witch grass away from young trees, it could be eliminated with one of these sprays and then kept down by mulching. This would reduce the cost over a period of years.

J. S. Bailey

- - - - - - - -

Strawberry Field Day
University of Massachusetts
Amherst
June 18, 1947

WIDER SPACING MAY INCREASE PER ACRE YIELD

An Experiment Station orchard of the Winesap variety in Washington was divided into two plots and one-half of the trees was removed in one plot. By the fourth year, removal of trees to 27 per acre produced more apples with higher color and larger average size than before. In the fourth year the closely spaced trees averaged 457 boxes per acre compared with 568 from the widely spaced trees. Man hours were saved in the major orchard operations of pruning, brush removal and spraying. Harvesting and irrigating took about the same amount of time, regardless of the spacing of trees; however, thinning in the widely spaced orchard was more time consuming so that it took slightly more total man hours to care for the widely spaced trees.

From the monetary standpoint, the production costs were less on the widely spaced trees every year, showing a saving of $31.00 per acre the fourth year. There was a net dollar gain in favor of the closely spaced trees only the first two years. The extra profit from the widely spaced trees the fourth year was large enough to more than cover the losses the first two years.

The results of tree removal may be summarized as follows: (1) Reducing the number of trees per acre from 54 to 27 produced larger sized apples, (2) Production per tree was increasingly greater each year after half of the trees were removed, (3) Widely spaced trees produced more boxes per acre than closely spaced trees by the fourth year, (4) By the fourth year the widely spaced trees were producing many more extra fancy apples per acre, (5) The percentage of extra fancy apples was greater every year after half the trees were removed, (6) Having fewer trees per acre proved to be time-saving on important operations such as pruning, (7) With half of the trees removed, 30 man-hours per acre were saved each year on spraying, (8) Though thinning time was saved the first 3 years, heavier production offset this the fourth year.

- - - - - - -

SOME FACTORS IN FRUIT MARKETING

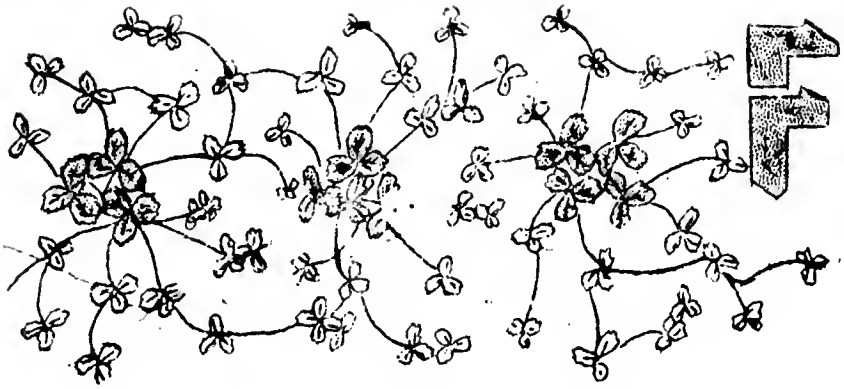
At the Marketing Conference in Cambridge last February, Chairman B. W. Drew of the Fruit Section opened the discussion with the following pertinent remarks: "The problem of marketing our local fruits is like our New England weather. Everybody talks about it but nobody seems to do much about it. We are producing apples and other fruits in the heart of the country's best marketing area. This is at once our salvation and our downfall. Our transportation costs are low our consumers are near and they prefer our McIntosh apples to other varieties, when they can get good ones. Why is this situation our nemesis? With so many factors in our favor we have not been forced to merchandize our products.

In short we have made a living the easiest way and yet some of our growers have found that it pays to do a fancy job.

Some of the factors leading to our poor merchandising are: (1) Many individual growers and many small units of production, each packing his own way. (2) The crate was a depression package to meet low buying power and was continued during the war because we could sell our apples anyway and couldn't get help to pack otherwise. (3) Our poorer grades have sold as fresh fruit because we lack a well developed by-products industry. Our costs of packing and shipping have been relatively low and we could get more for poor fruit on the fresh fruit market than elsewhere. (4) Our principal tree fruit, the McIntosh apple bruises more easily than any other variety and yet we and all other handlers have treated them like any other apple, or in many cases like citrus fruits, potatoes or onions. (5) Many of our good growers have considered their job done when they have grown clean fruit, put it in a crate and trucked it to market. How amazed many of us have been to see the apples (which we thought were pretty good when we shipped them) displayed in a bin in a hot store. Now the war is over and it is time to take stock of our present situation.

Competition for the consumer's fruit dollar is getting stiffer. Distant apple producing areas are after our market. They have to pack and grade well in order to pay their freight bill. Citrus is, and will be plentiful, cheap and good. This industry is largely under state or large cooperative control and will not be permitted to ship junk. Bananas and may other fruits will become increasingly plentiful. Customers can now spend their money for many things besides food. If a new car is being paid for, less fruit may be bought. There has been a strong trend toward self-service stores. These stores are apparently here to stay. If they are to sell apples the product will have to be graded and packaged like practically everything else in these super markets whether it be fruit or flour, onions or oatmeal.

What shall we do about these trends? We can 'let things ride' until competition forces or starves us into doing a better job. We can promote stringent packing and grading laws. We can raise a fund, state supported or private, to promote the apples as we now sell them on a state loyalty basis. We can blame the chain and independent stores for bruising our beautiful apples, and lose their good will. We can ask the U. S. Government to buy our culls for school lunches, and lose the confidence of our best customers, the kids. We can publish a report, stating how much better Washington state apples are packed than ours, and ask 'why don't we do the same'. We can ask for more research on more and better products from our low grade apples which will return us a reasonable price and strengthen our fresh fruit market. We can request more inspectors to enforce our present grading laws, when used. We can support the Apple Institute so it can enlarge promotional and store contact work. We can arrange grower and trade meetings to discuss grading, packing, and handling and we can promote store door delivery.



FRUIT NOTES

MR. DALE S. CARPENTER
EXT. SPEC. IN VISUAL EDUCATION
EXTENSION SERVICE
SOUTH COLLEGE- L2 46

July 10, 1947

Prepared by the Fruit Program Committee of the Extension Service
W. H. Thies, Extension Horticulturist

Contents

FACTORS WHICH INFLUENCE THE SET OF MCINTOSH APPLES

The prospects for a crop of McIntosh apples in Massachusetts orchards range from extremely light to extremely heavy. There is so much variation that growers are wondering which factors are most responsible. The process by means of which blossoms are transformed into young fruits on a McIntosh tree is a complicated one.

It is a well known fact that the setting of fruit involves a transfer of suitable pollen to a normal blossom and that favorable weather is essential. If a tree shows a "snowball bloom" and then sets only a few apples, it is obvious that something must have been lacking. And in a season when frosts occur during April and May growers commonly blame a light crop on low temperatures. But that is only one part of a complex situation. Seven factors will be considered in this discussion.

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

Frost. Injuries from low temperatures range from actual freezing of the developing fruit bud, either before or after the blossom opens, to a mere "touch of frost" which damages to some extent certain tender parts of the flower, including the pistil. Blossoms damaged in the latter way may open and appear quite normal, although the injury may be sufficiently severe to render the blossom incapable of setting fruit. This probably happened in many Massachusetts orchards this spring. Several growers have reported a better set on "frost pocket" trees than on those of higher elevation. The reason may be that the latter trees were a little farther advanced and thus suffered more on a frosty night. Heavy frosts must be considered as one of the factors responsible for crop reduction.

Leaves in 1946. Apple buds undergo a change beginning around mid-June which sets the stage for bloom the following spring. The development of the fruit bud, however, continues during the summer and fall. This development requires a supply of raw materials, including starch. If the foliage is badly infected by apple scab, as was the case in many orchards in 1946, it stands to reason that there is serious interference with the starch making program. And if the tree is actually defoliated in August or September, development of the fruit buds, which are due to become blossoms the following spring, suffers a severe setback. Many of the buds may fail to open at all while others may develop into fairly normal looking blossoms which are incapable of setting fruit. The condition of the 1946 foliage is apparently an extremely important factor in the 1947 crop.

Scab Infection During Bloom. With an abundance of overwintering scab spores in Massachusetts orchards last spring, and one or two infection periods while the trees were in bloom, there was ample opportunity for what might be termed "pedicel infection" in unprotected orchards, the pedicel being the stem of the blossom. To what extent this happened is a question, although if an apple blossom suffers pedicel infection it tends to drop off. Studies in another state show the loss of as much as 75% of the blossoms by this means.

Nitrogen Supply During Bloom. A starved tree is inclined to set only an occasional crop. It may bloom heavily and still set relatively few apples. The amount of nitrogen actually available in the tree during bloom plays an important role in the setting of apples. The nitrogen supply in many trees was probably rather low at blossoming time because of heavy rains which tended to wash nitrates out of the soil, and because less nitrogen was applied in early spring due to late delivery. It is reasonable to assume that some McIntosh trees were deprived of an adequate supply of nitrogen during the blooming period. This factor, however, is probably less significant than the loss of leaves in August, 1946.

Available Pollen. Although many things about the McIntosh variety are unknown, it is a well established fact that this variety is almost entirely self-sterile. Pollen of another variety must be brought to the stigma of the McIntosh blossom if a set is to be obtained. Many varieties are satisfactory, including Cortland, Delicious, Astrachan, Wealthy, Wagener, Duchess, Ben Davis, etc. Among the unsatisfactory varieties are Baldwin, Gravenstein, Rhode Island Greening, and the Winesap group.

The proportion of trees of pollinating varieties to McIntosh trees is today smaller than it was even 25 years ago, because many of the filler trees of pollinizing varieties have been cut out. In some orchards we see sizable blocks of McIntosh or of a McIntosh-Baldwin combination. In very few orchards can it be said that every McIntosh tree is not more than one tree distant from a good pollinizer. In spite of all that has been said about the necessity of cross pollination, many McIntosh growers have failed to take seriously the need for an abundant and nearby source of the right kind of pollen. They remember the occasional year when bees had two warm, sunny days during bloom, and nearby pollenizers seemed unnecessary. They forgot the years when bees venture only a few feet from the hive.

Good Weather During Bloom. It stands to reason that the mere availability of the right kind of pollen will accomplish nothing unless weather conditions favor bee activity and thus bring about a transfer of this pollen to the McIntosh blossoms. If the temperature falls much below 60°F., honey bees are quite inactive, although they have been known to fly to some extent from strong colonies with the temperature in the lower fifties. Suitable weather for bee activity must be considered as an important factor in the setting of McIntosh.

Bees. If plenty of pollen of the right kind is available and if the weather is suitable for bee activity, an abundance of bees of one kind or another will insure the pollination process. Bumble bees have been relatively scarce this spring. This made it more necessary than ever to have honey bees in the orchard. A widely varying supply of honey bees, under these conditions, helps to account for the uneven set of McIntosh.

As we attempt to place our finger on the factor or factors responsible for a light set of McIntosh, we cannot afford to overlook any of those mentioned above. Special emphasis must be placed on pollenizers and on scab control in 1946. Any one of the above factors if unfavorable, may have contributed to a light set. In many cases, two or more have exerted a combined influence. And unless all were reasonably favorable, McIntosh trees are probably showing something less than a normal crop at the present time.

- - - - - - - - - -

How Do They Do It? - One heavily loaded McIntosh orchard in Massachusetts is so free from scab that one must hunt to find a single scab spot. And yet the owner has done nothing out of the ordinary except to cover the trees completely and use a well timed combination of sprays and dusts as follows: May 1, 5, and 13 (Dust); May 16 (Spray); May 23 and 25 (Dust); May 29 and June 6 (Spray); June 10 (Dust); June 21 (Spray). And there you have the secret (except for the grower's technique) --- 4 Sprays and 6 Dusts up to June 25.

- - - - - - - - - - - -

Do You Know:

That the most common cause of failure to control apple scab is poor coverage in the top of the tree? With the best of intentions, growers of long experience are still inclined to "give scab a break" by using fewer gallons that are required, spraying entirely from the ground, or using too coarse a spray. Choice of materials and timing become insignificant factors where some of the leaves are left entirely unprotected.

That strawberry "nubbins" are frequently the result of a failure of the root system? If each seed on a strawberry, and the region surrounding it, is to attain normal development there must be an uninterrupted flow of water into the plant. Anything which interferes with root functioning will also interfere with photosynthesis. A "nubbin" is mute evidence that a section of the berry farthest from the source of supply has been on short rations.

That the so-called "Garden Huckleberry" which is actually sold by some dealers is nothing more than a large fruited variety of Black Nightshade? To classify it as an edible and palatable fruit is probably an undeserved compliment. J. R. Hepler of New Hampshire says they might make a good pie if enough lemon were added, but as far as he is concerned he'd rather have his lemon pie straight.

That the frozen food industry is doing a thriving business with wild blackberries in Tennessee? Through the efforts of the Extension Service in setting up collection routes, wild blackberries were harvested in 25 counties last season, resulting in earnings of more than half a million dollars for the pickers.

That one dollar invested in lime and fertilizers for top dressing hayland may return two or three dollars in mulch materials? In many cases, treatment of a meadow outside the orchard will pay bigger dividends by providing a nearby source of mulch that if the fertilizers were used in the orchard itself. What's good for a worn out pasture is also good for a worn out hayfield. In Pennsylvania, almost three dollars worth of milk was obtained for each dollar spent in improving an old pasture. Three dollars worth of apples are probably obtainable by a similar procedure.

That ammonium sulfamate appears to be one of the most effective weed killers for combatting poison ivy? In tests conducted in the University Orchard, this material commonly known as Ammate, did a better job than several other chemicals, including 2, 4-D. Where sprayed around young peach trees, however, to kill the grass and weeds, it also killed the peach trees.

That the Boston Flower Show brought requests for horticultural information from more than 5,000 individuals? In response to cards signed by visitors, a total of 23,559 publications was mailed out.

That certain insects may be more numerous on plants which are in a good state of nutrition? Work conducted on citrus trees in Florida show that where fertilizers were applied in combinations to give the best growth and yield, the infestations of certain insect pests were also much increased. Trees lacking proper fertilization presented less of a control problem and produced less fruit.

That approximately 266 acres of strawberries are being harvested in the Falmouth area this season? A probable drop to 229 acres is indicated for next year. In some of the pre-war years the acreage was up around 600.

That a yield of apples amounting to 500 bushels per acre per year is being harvested in a few orchards in the Northeast? An Illinois authority says, "We should be thinking in terms of a minimum of 500 bushels per acre. Too many growers in Illinois are consistently getting this production for us not to recognize it as a possible goal." In certain far Western areas, the average yield is around 700 bushels per acre per year, and yields seldom vary more than 10% from year to year.

That the largest soil conservation program ever undertaken by private industry is found in the pineapple plantations of Hawaii? By 1939, it was discovered that most of the pineapple lands had lost from one-fourth to three-fourths of the topsoil. After heavy rains the blue ocean waters around the island were stained red with soil for miles out. In 1944, over 6,000 acres were terraced and contour planted. With the completion of the 1947 planting, nearly all of the 27,000 acres of a particular company will be on the contour.

That farmers in the U. S. used more commercial fertilizer in 1946 than in any previous year? Increasing for the eighth consecutive year, fertilizer consumption approximated 14,900,000 tons. The increase over 1945 was about 13%.

That the owners of coke ovens near St. Denis, France were pioneers in the reclaiming of ammonia as a by-product in the manufacture of coke? The first retorts were built in 1858 and the ammonia gas run through sulfuric acid to obtain the nitrogen-rich crystals of ammonium sulfate. About 21 pounds of ammonium sulfate are obtained from one ton of coal.

That the pressure loss due to friction in a spray hose of small diameter may amount to several hundred pounds per square inch? When 5 gals. per min. are delivered through a 50-ft. length of 3/8 in. hose the loss is 90 lbs. Delivery of 10 gals. per min. (if that were possible) would mean a loss of 325 lbs. The same delivery through 50 ft. of $\frac{1}{2}$ in. hose results in losses of 18 and 65 lbs. respectively. Strangely enough, when 20 gals. flow through the same length of 3/4 in. hose, the loss is only 40 lbs.

That the delivery of spray material through a spray nozzle with disc opening 4/64 in. in diameter is more than doubled as the pressure is increased from 200 to 800 lbs. Gallons per min. amount to 1.2 and 2.5, respectively. At 500 lbs. the delivery is 1.9, whereas a slightly larger disc opening (6/64 in.) actually delivers at that pressure, twice as much, or 3.8 gals. per min.

That the amount of russeting and poor finish on apples is influenced by the spray material and by the weather, or a combination of both? Experiments in Michigan show that Bordeaux Mixture and other copper materials produced fruit with poorer finish than where various forms of sulfur were used. Varieties were found to vary in their susceptibility to spray injury, McIntosh showing more copper russeting than Delicious. In Massachusetts, Fermate has proven better than sulfur on Delicious from a finish standpoint.

That the worst insect pest of quinces in Massachusetts is probably the Oriental fruit moth? DDT in the First Cover and in three later sprays at 3-week intervals is recommended. Other pests of quinces include quince curculio, codling moth, quince rust, black rot, bitter rot, leaf blight and Brooks' spot. Now that two highly promising materials, DDT and Fermate, are available, quince pest control is on a much firmer basis.

- - - - - - - - - -

DO STRAWBERRIES RUN OUT?

On a recent trip to Cape Cod, County Agent Tomlinson called my attention to a more or less general opinion among the Falmouth growers that strawberries maintained on the same farm for several years are inclined to "run out", showing a gradual decline in plant vigor, plant size, and yield. On the other hand, he pointed out how vigorous and productive plants appeared to remain when grown year after year for plant production on the County Farm under a heavy fertilization program.

Farms were visited where there was evidence that County farm-grown plants produced much more vigorous beds than plants grown by local growers or plants shipped in from southern nurseries.

The following article was written by R. J. Haskell, Federal Extension Pathologist at Washington, D. C. following an inspection of the U.S.D.A. strawberry trial plots at Beltsville, Maryland. It indicates the possibility that obscure virus diseases may be concerned in a so-called "running out" of strawberry varieties.

"Why do strawberries 'run out'?" Why is it that plants of many eastern varieties from some sources do not do well -- are stunted and die? Why does Catskill, for instance, from one source, do so much better than Catskill from some other source? Mr. Demaree is beginning to find the answer to some of these questions. By grafting eastern varieties from many different sources on to the western variety Marshall, which shows leaf symptoms of yellows or crimps well, he is able to prove that many of

our eastern varieties are really carrying a latent virus disease, which, except for dwarfing in varying degrees, may show no other leaf symptoms.

"What does this mean? Does it mean that we will have to pay more attention to virus-free plants? Does it mean that some states are better adapted for producing healthy plants than others? Does it mean that we may have to consider controlling an insect vector? Does it mean that indexing and certification of strawberry plants will have to assume a more important role? We think it does."

O. C. Boyd

- - - - - - - - -

DISEASE FREE PLANTS IN MASSACHUSETTS

A plan to establish disease-free standards on Massachusetts grown berry plants was announced today (May 28) by Agriculture Commissioner Frederick E. Cole. Under this plan grades and standards will be established based on inspection of nurseries or farms where berry plants are grown. Owners of disease-free plantations will be authorized to label their products showing that they had been officially inspected and certified.

It is tentatively planned to have this certification appear on a blue tag, and the certified nurseries or farms would be known as growers of Blue Tag plants. The tag will be available for use on strawberries, raspberries, blueberries and other berries and small fruits as the need develops.

The purpose of this certification is to stimulate the growing of disease-free stock in Massachusetts, and at the same time to encourage the planting by Massachusetts fruit producers of certified plants which have been grown within the Commonwealth.

Public hearings will be scheduled during the early summer, at which plant growers will be given the opportunity of discussing the standards that will be established and of acquainting themselves with the details of the plan.

- - - - - - - - -

WHERE DOES BROWN ROT COME FROM? (This interesting statement is borrowed from the May issue of King Apple and Queen Peach-Illinois).

Dwight Powell, pathologist of the Department of Horticulture, answers an important question which will help us to better understand brown rot and help growers to combat the disease more intelligently.

"This question has been asked many times by growers interested in brown rot control on peaches. Each spring during bloom it is possible to find mummies on the ground with a cup-like structure called the apothecium, which is the perfect stage of the brown rot fungus. With a small amount of stimulation, a cloud of spores will arise from these apothecia. These

spores float or are carried by air currents to the blossoms of the peach, producing blossom blight. Close observation shows that this infection extends from the blossom into the twig. Closer observation shows minute tufts of conidia (summer spores) on the surfaces of the blossom and twig. These spores may infect more blossoms. Each time it rains or becomes humid for any length of time (about four hours) a new crop of conidia is produced on the surface of these cankers. At first infection is evidenced by the blighting of the blossom. The second symptom which appears about shuck fall is twig dieback. Wherever a blossom has blighted, the twig infection or canker girdles the twig and starves everything beyond the canker. Blighted twigs are evident in orchards now. With severe infestations of curculio, it will be difficult to control conidial infection on the young peaches. To reduce brown rot in the peach orchard, it is going to be necessary to control blossom blight. Orchards in which twig dieback occurs contain the necessary inoculum for severe preharvest brown rot infection. Frequent use of fungicides through the summer is therefore suggested."

- - - - - - - - - - -

CONTROL OF THE PEACH TREE BORER WITH DDT. (From Storrs Horticultural Notes by Philip Garman).

According to work done in Connecticut and New Jersey, there is considerable promise in control of peach tree borers with DDT. Unlike treatments formerly recommended (paradichlorobenzene or ethylene dichloride) DDT must be applied when the moths are flying and depositing eggs, June and July and possibly August, in Connecticut. According to experiments by Mr. Wallace of the Connecticut Station, only one application made on June 23 gave excellent control in nursery stock. The material was applied as an emulsion in Velsicol, a mixture of mono and dimethyl naphthalenes. Concentrations varied from 3/4 pound to 3 pounds actual DDT in 100 gallons, but controls were best at 1-½ and 3 pounds. Apparently 3/4 pound per 100 was not enough under the conditions of his tests. The mixture used by Mr. Wallace should be kept off the foliage particularly in hot (90 degrees F.) weather as should most commercial DDT emulsions.

In New Jersey, Dr. Driggers of the New Jersey Experiment Station reports control of the peach tree borer with one spray applied to control Japanese beetles and the Oriental fruit moth. His observations also include results from two sprays. The figures given show a difference of .4 borers per tree from one spray to .05 borers per tree from two sprays and 2.20 borers per tree from no spray. This means five times as many borers in check trees as in those receiving one spray and 45 times as many borers in check trees as in those receiving two sprays.

DDT acts by killing the moths and presumably the young larvae before entering the trunk. Moths are on the wing in the state beginning in late June and continuing through July and into August. Mr. Wallace's experiment was designed primarily to kill young larvae and his emulsion probably was effective for two to three months. The wettable DDTs are

known to last a much shorter time so the increased benefit in Dr. Brigger's tests from more than one application becomes understandable. The whole subject of peach borer control with DDT is so new that it would be unwise to appear too optimistic at this time, but the possibility of controlling Japanese beetles, Oriental fruit moths and peach tree borers with one or two treatments is particularly inviting and well worth a trial by those planning to use DDT during the coming season.

Suggestions. When using DDT for Oriental fruit moth or Japanese beetle make special efforts to cover the trunk at the base, and the ground immediately surrounding it. For those desiring control of the peach borer alone, oil soluble emulsifiable concentrates are on the market and should be diluted to not less than the minimum figures determined by Mr. Wallace 1-½ to 3 pounds actual DDT per 100 gallons. Apply only to the trunk and ground surrounding the base - not to foliage. Wettables used for tree sprays are commonly 50% DDT and should be diluted 2 to 3 pounds to 100 gallons. We have no direct information as yet on the effectiveness of sulfur-DDT dusts for peach borer control.

- - - - - - - - -

"Goo" - In the recently published "Autobiography of William Allen White" there appears on the first page the following: "And for perhaps two years, so far as my memory tells me, I was unconscious..... My memory tells me that I waked up when I was nearly two years old. I was in my father's arms..... My father, with his pocket knife, was scraping an apple into pulp and feeding it to me on the point of his knife and I was gurgling in delight..... This no one told me. I remember it." This is interesting for two reasons; first, that as long ago as 1870 scraped raw apple was recognized as good baby food, and second, that Mr. White's first recollection was of eating apple. While the use of a pocket knife as a baby spoon might be questioned, the feeding of scraped raw apple to babies when they are old enough to take solid food meets with universal approval.

J. S. Bailey

- - - - - - - - - -

No June FRUIT NOTES -- Lack of clerical help and a heavy field schedule have prevented preparation of Fruit Notes during June. The August issue will carry an article of special interest by W. G. Colby of the Agronomy Department.

- - - - - - -

F & H Week FRUIT Meeting, Featuring Spraying Equipment
U of M, Amherst, Mass., July 31.

This Hurry Up Age - A few weeks ago a good grower in the town of Sheffield telephoned to make an appointment to talk over an important move in his fruit business. When he arrived, about 15 minutes late, this was his explanation, - "I wanted to finish putting on my Calyx spray this morning and when the last load was out around noon, I hustled down to Canaan, Conn., where a friend of mine has an airplane. He brought me to Northampton, where I grabbed a taxi, and here I am." The writer felt quite puffed up to learn that a mere date seemed to justify so much fuss and bother. But, mind you, the visitor finished his "home work" first.

- - - - - - - - -

A New Orchard on a Better Soil Type -- About 12 years ago, while studying a Soils Map with a grower in the Hashoba area, the writer noticed that there was a field belonging to a neighbor, immediately adjacent to the grower's orchard, of an even better soil type than that on which his present orchard is planted. A remark was made that here would be a good direction in which to expand his orchard. Last week this grower announced with real satisfaction, "After negotiating for 12 years, I've finally succeeded in buying that 11-acre field just above my orchard".

- - - - - - - - - -

CONSERVATION AND LAND IMPROVEMENT TOURS - Western districts, July 22; Central (Worcester County) districts, July 25; Eastern districts, July 24. (For further information see one of your district supervisors or your county agent.) A. B. Beaumont

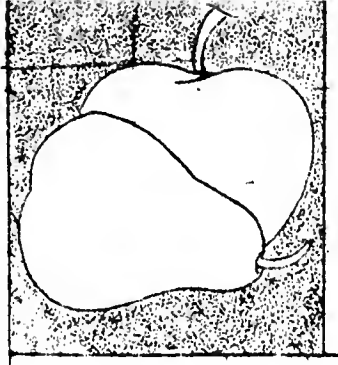
- - - - - - - - - -

At least two out-of-state groups of growers will visit Massachusetts orchards this summer, -- Vermont, August 11 and 12; Rhode Island, (date to be announced).

- - - - - - - - - - -

A new Leaflet, "Dwarf Fruit Trees for the Home Garden" has been prepared by J. K. Shaw and will go to press soon.

- - - - - - - - - - -



Fruit Notes

August 29, 1947

Prepared by the Fruit Program Committee of the Extension Service
W. H. Thies, Extension Horticulturist

Contents

SOILS AND SOIL-PLANT RELATIONSHIPS

"...." if the fundamental principles of the soil are understood, you ... will find their applications to practice." This short quotation from G. W. Robinson's little book, "Mother Earth - Letters on Soil", explains why a discussion such as this appears in a publication such as "Fruit Notes".

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

It is the writer's firm conviction that the more we as growers of plants learn about soils and soil-plant relationships, the more interesting and fascinating (and perhaps profitable) this business of growing plants becomes. It's something like playing a game of bridge - one doesn't enjoy the game until he begins to understand something of the rules and principles which are involved. The writer doesn't pretend to know a great deal about growing plants - or playing bridge either, for that matter, but he has learned enough to enjoy both and he finds that the more he learns about each form of activity, the more interesting and pleasuresome each becomes.

Role of the Soil in Crop Production.

The soil serves two important functions in the growth of most crop plants; first, it provides mechanical support and second, it serves as a reservoir for certain essential plant nutrient elements. The manner in which the soil serves as a reservoir and a supplier of essential nutrient elements has been the object of intense study for the past 25 years. While different soils vary tremendously in their capacity for storing and supplying nutrient elements to growing plants, the mechanism by which this is accomplished is similar for all soils, at least so far as the fundamental principles are concerned.

Until comparatively recently it was generally thought that nutrient elements must be in some soluble form before they could be taken up by plants. For years, the "soil solution" was considered to be the important part of the soil as plant nutrition was concerned. No one was able to either separate the "soil solution" from the soil or to duplicate it artificially. Yet it was generally felt that the difficulty was one of faulty technique rather than one of interpretation. While water is essential for plant growth, it is now generally agreed that the movement of water into plants takes place independently of the uptake of plant nutrition.

Evidence accumulated which pointed to the colloidal fraction of the soil as the important soil component in plant nutrition. The finely divided particles of clay and organic matter, the material that remains in suspension, giving a cloudy appearance when a soil is shaken in water is the seat of greatest activity. Here is where important transfers took place between plants, roots and the soil.

The Mechanism of Base Exchange or How Plants Feed.

We now have convincing evidence which shows that plants can take up nutrient elements through the small rootlets or root hairs at the points of contact between these root hairs and small colloidal particles of clay and humus. These colloidal particles are charged electrically and carry a negative charge. Since they are negatively charged, they have an affinity for positively charged elements such as hydrogen, calcium, magnesium, potassium, nitrogen in the ammonium form and others. A single clay or humus particle may have several of these different elements "attached" to its surface. There might be several calcium ions, several hydrogen ions, a few magnesium and potassium ions and perhaps a boron ion, all present on a single colloidal particle. When a plant root hair comes in contact with such a clay or humus particle, an "exchange" or transfer can take place whereby a positive hydrogen (produced by living processes within the plant root) from the root hair can be exchanged for a positive

calcium or magnesium or potassium ion held on the surface of the soil particle. As the plant continues to grow, the reserve of these nutrient elements held by the soil colloids is gradually depleted and their place is taken by hydrogen.

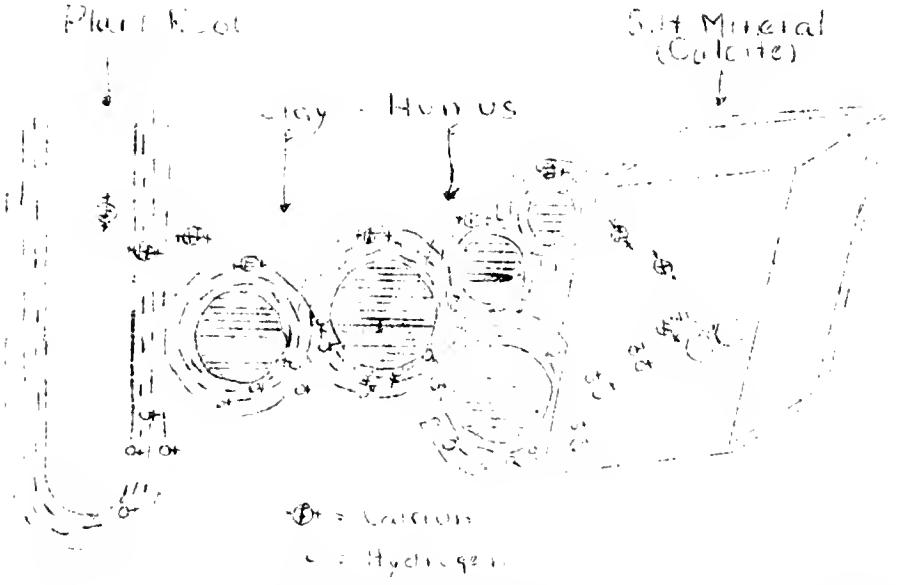
As hydrogen is "exchanged" for various essential nutrient elements, the quantity of hydrogen held by the clay and humus colloidal material tends to increase. This in turn increases the number of free hydrogen ions in solution. Since it is the free hydrogen ions in solution which determine the degree of soil acidity, soils tend to become more acid in reaction as successive crops are removed.

Soil Acidity and Plant Growth.

One of the important things to note here is the exceedingly vital and useful role which the hydrogen ion plays in the mechanism of plant nutrition. We have tended to look upon the presence of hydrogen in the soil solution with disfavor and to consider that the soil acidity was something which should be corrected. It now appears that a little soil acidity is a good thing and that to a certain extent at least, it is not so much the acidity of acid soils but the lack of essential nutrient elements such as calcium, magnesium, potassium and others which is responsible for poor plant growth. When the reserve supply of these essential elements in the soil is replenished through liming and fertilizing operations, normal crop growth results.

Liming alone would correct acidity and supply calcium and magnesium if dolomite is used but it would not correct deficiencies of other essential nutrient elements. In other words, "Lime alone without manure makes the farm and farmer poor."

W. G. Colby

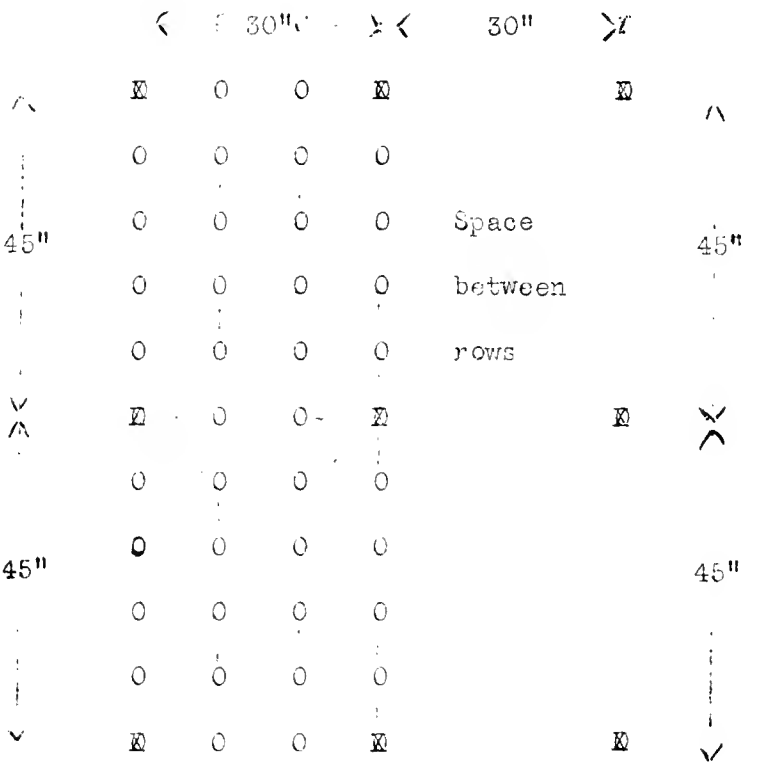


Nutrients, like calcium, move from the mineral to the colloidal clay and humus, and from there to the plant roots (right to left). Hydrogen, or acidity, traded by the root for nutrients, goes in the opposite direction to break down the mineral crystals like limestone and to put the calcium nutrient into availability for the plant.

by William A. Albrecht
Department of Soils, University of Missouri

HERE'S AN IDEA

A very successful grower of strawberries in Bristol County has adopted a rather unusual system of spacing. He likes it so well that we pass it along for the consideration of other growers. In brief, the system involves filling in with properly spaced runner plants the spaces between alternate pairs of rows and leaving blank the spaces between the remaining rows. The plants are set 30 x 45 inches. This permits cultivation both ways until the spaced runner plants interfere. When spacing is completed, the plants will stand 9 x 10 inches apart, each mother plant being allowed to develop 4 runners, one of which will have 3 runner plants and 3 will have 2 runner plants each. The working space between rows is 30 inches although plant growth is so heavy it seems somewhat less.



⊠ = mother plant

- - - - - - - - - - - - -

FARM SAFETY, A FAMILY AFFAIR

The recent observance of National Farm Safety Week has shown farmers the importance of year round safety. Since the farmer is usually his own boss and employs only a few men, he can make the decision that means the difference between safety and sorrow on his farm and in his home. But his decision will bring more results if backed up by common action on the part of each member of the family.

Farm safety is particularly a family affair because unlike the urban dweller, the family is closely associated with the actual operations of farming.

Common sense tells us, for example, that children have no more right to be near or on a piece of operating farm machinery than city children have to be around a punch press or a moving locomotive; they have no more business driving a tractor than city children have behind the wheel of a 100 horse-power passenger automobile.

All members of a farm family need to know the danger spots on their farm--and these spots need to be made as safe as humanly possible. The National Safety Council estimates that one out of every 10 farmers will suffer a disabling injury, either on or off the job in 1947, unless extra precautions are taken.

One out of every 350 farm families will suffer the pain and sorrow which accompany accidental deaths in 1947 unless extra precautions are taken. Four farm buildings will be destroyed by fire every hour during 1947 unless extra precautions are taken.

The family should learn three things:

1. What hazards menace their lives at home, at work and on the highway.
2. What each member of the family can do to eliminate as many of these hazards as possible.
3. That carelessness on the part of any member of the family perils the lives and happiness of all.

As President Truman says: "Caution and intelligent effort on the part of every farm family in the land will lessen the suffering and economic loss caused by accidents."

G. Van Horn

- - - - - - - - - - - - -

PREMATURE COLORING OF EARLY MCINTOSH

During July of this year, as in 1946, the premature reddening of Early McIntosh apples in certain heavily loaded orchards attracted considerable attention. This condition seems to be associated with hot, dry weather in early July and with an excessively heavy load of fruit. There is reason to believe that this variety is particularly susceptible since other varieties growing alongside show no early coloration.

A complete solution of this problem will await further study. The contention of one individual that a particular spray was responsible has not been substantiated. The possibility of boron deficiency is being investigated, and if a shortage of that element is found, it will give further support to the opinion that the problem is associated with the water supply in the individual fruits. It is a well known fact that boron deficiency shows up in years when drought occurs at a critical season.

In July 1946 Fruit Notes this observation was reported. Trees showing many small, red apples also showed enough green apples for a normal crop and the latter apples had a somewhat higher average seed count than the red ones. If all of the apples showing premature coloring had been removed

in late June along with enough of the green apples to bring about an average spacing of 6 or 7 inches it is just possible that the problem would largely disappear. Growers who practice early and heavy thinning have reported no difficulty.

- - - - - - - - - - - -

THE DWARF APPLE TREE SITUATION

English horticulturists have performed a real service in bringing order out of chaos as regards dwarfing stocks. They assembled and made a thorough study of such stocks from all over the world including French Doucin, English Paradise and many others and then assigned the so-called "Malling" numbers ranging from I to XVI. Each of these numbers refers to a stock which exerts a definite dwarfing tendency. Thus Malling IX has come to mean a tree of a certain size. It might therefore be assumed that a grower could order and obtain a tree budded on a particular Malling stock instead of a mere "dwarf tree", the common designation in years past.

The public was quick to grasp the significance of the English classification and, thanks to much favorable publicity, ordered more trees than the nurseries were able to furnish. Prices mounted, and certain nurseries redoubled their efforts to supply the demand. They established stock beds involving several of the Malling numbers. But unfortunately, some of the nurserymen have mixed up their Malling stocks, and while minor differences are apparent to a careful observer, separation and identification are difficult reminding us of the work which the English horticulturists did so painstakingly, years ago. Thus a program which should simplify a complex situation is showing signs of confusion. Ultimately the nurseryman may limit himself to one or two dwarfing stocks. At present, there is at least a possibility, as in telephoning of "getting the wrong number".

- - - - - - - - - - - -

The Fabulous Benton Harbor Market. Sales of products on this famous Michigan market reached an all time high in 1946, the total amounting to $9,361,540.29 according to the State Market News Service. Peaches were the biggest item, 1,445,339 bushels with a value of $3,150,839. Apples were second with 791,307 bushels which averaged $2.06 per bushel. Next came strawberries with 136,283 crates averaging $7.14 per crate, and grapes had a total value of $765,103.

Wanted. A good, bearing apple orchard of 15 to 20 acres not more than 25 years old; buildings of less importance than soil, site and varieties.

The Red Apple Club. Although the writer is at present in Shenandoah, Iowa, on a nursery inspection trip, plans are being made for a careful inspection during September of each block submitted in connection with membership in the Red Apple Club. The total number of applications is not large in view of the high standards as regards yield, grade and freedom from blemishes. Each application will be carefully considered on the basis of an official sample and the total yield. If no more than ten individuals qualify for membership this first year, bearing in mind the many hazards of the current growing season, the record will be a gratifying one.

WHT/mag/8/26/47

Fruit Notes

October 20, 1947

Prepared by the Fruit Program Committee of the Extension Service
W. H. Thies, Extension Horticulturist

Contents

WHY THE LATE COLORING MCINTOSH?

In an average season, September 15 to 25 marks the height of the McIntosh apple harvest, with picking getting under way around September 12. This season very few were picked before September 15 and in many orchards even then the tinge of color was not typical of the variety, while a large percentage of the crop was still green. Wealthies, normally picked around September 10, were still on the trees ten days later because so many of them were as green as the pastures of Vermont. A review of weather conditions may help to explain this lack of color.

Bloom came a week or ten days later than usual. This would tend to delay harvest since a fairly definite number of days must elapse between pollination and maturity of fruit. As the summer progressed, the exposed

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

side of the apple seemed reluctant to take on more than a tinge of color. Much of August and the first three weeks of September were muggy. Growth of the fruit continued but nothing had happened to initiate the process of color development, as for example cold nights which are often followed by clear days. Not until the first frost around September 21 or 22 did coloring proceed rapidly.

The writer was in a high elevation orchard on September 26 and the McIntosh harvest was just getting under way. It continued until about October 8. In this orchard the apples with partial exposure to light were still too green to pick while the type of color on those on the outside would be greatly improved by another week of good coloring weather. Incidentally, the fruit was sticking on tenaciously even though no hormone had been applied. There had been practically no drop up to September 26.

Ultraviolet light is apparently an important factor in color development. Less of this portion of the sun's energy reaches the earth when the atmosphere lacks the clearness of a frosty morning. The notion still persists that cold nights bring out the red color in apples. The cold nights tend to set the stage, and the clear days provide the magic touch which transforms into a brilliant red pigment, a material manufactured by the leaves.

- - - - - - - -

SOME HARVEST SEASON OBSERVATIONS

Almost everything we do in the orchard during the year has as its objective the production of a large crop of high grade fruit. We prune, spray, thin, fertilize, etc., in order that each tree may yield its full share of well colored, unblemished fruit. In the rush of the harvest season, when counting bushels and supervising inexperienced help seems of utmost importance, we are likely to miss out on an opportunity to size up the results of our efforts. A day spent in looking around while the fruit is still on the trees may pay big dividends.

If we look at a bearing tree at all critically, we notice at once a difference in color of the fruit on different branches, and we take as a matter of course the green fruit on the inside of the tree, assuming that little can be done about it. But many trees have more than their share of limbs which never receive the direct rays of the sun. Pruning to remove these handicapped limbs can be done much more effectively if we first observe where the poorly colored apples are produced.

Limbs which hang down in the grass are obviously in the unwanted class. The same is true of those parts of limbs which are drooping, heavily shaded, or submerged and as a result produce few Fancy apples. At pruning time we may well concern ourselves with the removal of these unprofitable limbs and parts of limbs, instead of cutting off enough of the over-topping limbs to let the sunlight in. The limbs with foliage now exposed are almost certain to be younger than the shaded limbs and are therefore in better position to produce Fancy fruit.

Another observation worth making at harvest time has to do with the location of insect and disease blemished apples. If the topmost limbs show more scab than other limbs and if the outside row of trees shows more curculio than trees in the center of the orchard such observations point the way toward orchard improvement along these lines - (1) lowering the tops of trees which cannot be reached with spray material, (2) eliminating barriers along the edge of the orchard to permit spraying each tree from all sides, and (3) paying special attention during the spraying season to those parts of trees which at the present time show more blemished apples.

But our observations ought not to end with a comparison of color and pest blemishes. Is the average size of the fruits of all varieties as large as it should be? Are many two-inch apples in evidence on heavily loaded, biennial bearing trees? If so, when thinning time comes around next June (after the June drop is over) it may be a good investment to thin heavily, and thin early.

How about the color of leaves? Are the leaves on some trees dark green while other are yellowish? If so, maybe we can ease up on the amount of nitrogen on certain trees and give more to others. The nitrogen supply is reflected in leaf color as well as size and color of fruit. The practice of giving so many pounds of nitrate of soda to each tree needs to be modified in accordance with the present vigor of the tree. Some trees can use a double amount to a good advantage while others may need little or none at all.

One other observation seems to be in order. Many orchards show characteristic symptoms of magnesium deficiency. Others show marginal burning while still others show what appears to be a combination of spray injury and malnutrition. A tree with an ample supply of all needed mineral elements is apparently more resistant to spray injury than a tree which lacks one or more of these essential elements. The writer has in mind one young orchard which was planted immediately after the removal of old trees. The soil was apparently depleted of certain elements needed for tree growth and as a result these young trees show rather heavy defoliation. A thorough going soil improvement program, including a liberal application of high magnesium lime and of a complete fertilizer or of manure, will be necessary if these young trees are to get off to a proper start. It is false economy to allow young trees to loaf along on a starvation diet. There are too many 10-year old apple trees in Massachusetts today which are no larger than well grown 5-year-old trees. A critical look at individual trees before the leaves fall, will provide the basis for better soil management and a better spray program in 1948.

- - - - - - - -

No September FRUIT NOTES -- Partly because of extended field trips in connection with the Red Apple Club, no issue of Fruit Notes was prepared during September. (Maybe no one noticed the omission).

- - - - - - - -

THOSE ABNORMAL LEAVES

Apples. Numerous samples of apple leaves have been mailed to the University this fall with the question "Why the brownish areas?" The answer is not necessarily the same in each case, since the browning doesn't always follow the same pattern. Some leaves show mainly burned out scab spots with the brownish area extending a quarter of an inch or more beyond the edges of the spot. Here it is evident that whatever spray material was used, it was caustic enough to eliminate the spot and a little of the normal leaf tissue for good measure. Under the right weather conditions (probably hot, muggy weather) a wettable sulfur plus lead arsenate might be responsible. And if lime sulfur were used, marginal burning as well might result. Scab infections at frequent intervals in spring and early summer, have set the stage for a considerable amount of burning from subsequent sprays.

But spraying doesn't account for all of the abnormal leaves. The nutritional set up of the tree seems to be another important factor. It is a matter of common observation that an impoverished tree is much more subject to spray burn than a vigorous tree. The latter is able to withstand almost any spray program within reason, while a slight lack of balance or a deficiecy of an essential element such as magnesium, may manifest itself in off color foliage if not actual scorched areas. Very characteristic magnesium deficiency symptoms (a yellowing or browning of the leaf tissue between the veins) is apparent in some orchards this fall.

The practice of setting young trees on an area where an old orchard has been removed, without first replenishing all essential mineral elements through the use of high magnesium lime, manure, complete fertilizers, cover crops, etc., may bring to light real deficiencies in young trees, if not actual defoliation. Old apple trees do not necessarily exert a toxic effect on the next planting although they may remove certain available mineral elements so completely as to place the young tree on short rations.

Peaches. Within the past few weeks the writer was asked to examine two peach orchards in which some of the trees show abnormal leaves. In both cases the diagnosis was arsenical burning of the twigs. One of these orchards has been dusted with lead arsenate several times and was practically defoliated. The other was adjacent to an apple orchard and some of the nearby peach trees had received too much drift from the apple trees.

Arsenical burning of peach twigs may be easily recognized by the brownish color of the bark, cracking of the bark where the injury is severe, gummy masses here and there and early defoliation. Where only a slight amount of injury occurs the leaves may hang on fairly well although they may appear yellowish and some of them may suggest certain virus diseases, such as X-Disease. These two ailments should not be confused however, since the latter is characterized by a yellowish appearance in irregular areas of the leaves, these areas later turning brown and dropping away, leaving a ragged or lacy appearance. As in arsenical injury the older leaves tend to drop first.

Since X-Disease seems always to be associated with diseased choke cherries, it is unwise to plant a peach orchard anywhere near these alternate host plants. And whenever diseased trees show up in the orchard it is well to remember that X-Disease is incurable and that the fruit is certain to be bitter and unsalable. In a peach orchard as in any other kind of an orchard, diagnosis is of utmost importance, for only than can proper steps be taken to insure healthy, high producing trees.

- - - - - - -

MAGNESIUM DEFICIENCY, A MAJOR PROBLEM

Many of our soil types along the Atlantic seaboard are notoriously low in the element magnesium. Crop removal, erosion and leaching tend to deplete the already limited supply of this highly essential element. It is well to bear in mind that magnesium enters into the composition of chlorophyll, the green coloring matter in plants. Without an ample supply of magnesium, no green plant, that is no plant dependent upon the products of photosynthesis, can function normally. Distinct symptoms of magnesium deficiency have been observed in the following fruits in Massachusetts, - apples, peaches, grapes and raspberries. The most common symptoms are a yellowing or browning of certain parts of the leaf blade between the veins. The midrib and veins tend to remain green while other parts of the leaf take on a yellowish or brownish color. Early dropping of McIntosh apples is another symptom of magnesium deficiency.

As much lime has probably been applied in Massachusetts orchards during the past 5 years as was applied during the previous 10 years. But only a start has been made in replenishing the magnesium by this means, and in many cases the soil is still extremely acid as a result of repeated applications of sulfur over a period of years. It should be the goal of every orchardist to apply enough high magnesium lime to bring the pH up to at least 5.5. This conditioning program will not only replenish the supply of magnesium and calcium, but at the same time it will help to make available other elements including nitrogen. The cover crop will tend to improve as this balanced condition is restored and greater benefits will be obtained from a complete fertilizer application since there will be less tendency for mineral elements to remain in an unavailable form.

Such a program may be considered as a form of insurance against a magnesium deficiency, 5, 10, or more years ahead. But high magnesium lime cannot be relied upon to provide needed magnesium in the tree this year or next. It is too slow acting to provide needed magnesium promptly. Where deficiency symptoms exist, Epsom salts, known to the chemist as magnesium sulphate, is one of the recommended materials. Both high magnesium lime and Epsom salts should be used in a very acid soil where there is reason to believe that the supply of available magnesium is at a low level. A high magnesium lime will serve a very useful purpose in future years while the Epsom salts will tend to supply needed magnesium within a few months.

- - - - - - - - -

A NOTE ON POLLINATION

The effect of a near-by pollenizer on the crop of McIntosh may be observed over and over again in Massachusetts orchards this fall. The light crop in many orchards is probably due less to frosts than it is to faulty pollination. In a season when bee flight is limited, we must make it easy for the bees to carry suitable pollen to the McIntosh blossoms. Warm, sunny weather during the blossoming period may be extremely limited. A McIntosh tree next to a Red Astrachan tree stands a much better chance than a McIntosh tree in the middle of a McIntosh orchard. We would go so far as to suggest that the ideal arrangement in a McIntosh orchard is for every tree of that variety to be not more than one tree distant from a good pollenizer. In a solid block of McIntosh trees no better solution can be found than to graft one prominent branch in each tree to a good pollenizer such as Red Astrachan or Golden Delicious.

- - - - - - - - -

TO PROP OR NOT TO PROP

In years past it was not at all uncommon to see heavily loaded apple trees generously supported by prop poles of assorted lengths. One tree might have a dozen or more props tilted outward from the trunk to relieve the strain on crotches in danger of splitting. And in the off season, huge piles of these poles were in evidence at points convenient for next year's use and for winter quarters of the codling moth, as well. Today, propping of apple trees seems to be less common. If such is the case, what may be the reason? Right or wrong, here's our guess:

Modern pruning methods tend to develop a tree with stronger framework. A leader tree, with its wide angled scaffold limbs and its absence of whorls, will support a tremendous load of fruit with little or no breakage. Limbs will curl downward, in a manner reminiscent of the Norway spruce, but the sturdy crotches refuse to give way. If breaks do occur they are usually found where a limb has been allowed to divide into two more or less equal parts.

In a vase-form tree, or one of the multiple leader type, a heavy load of fruit may cause a third or half of the tree to split away. Or we may find a three-way split with the entire tree resting on the ground. It is no wonder if the owner would consider spending weeks cutting prop poles, after the complete loss of a few trees capable of bearing 25 bushels of apples each.

This fall one may see unpropped orchards bearing more than 400 bushels per acre with only an occasional limb giving way. Seldom does the broken part amount to more than a tenth of the tree because the framework is designed for holding up heavy crops of fruit over the normal life span of the orchard. The situation may be summarized in this way: Prop poles are much less essential in trees of good framework. They provide hibernating quarters for codling moths. Unless properly placed, breakage may occur in spite of propping. Placing props involves skilled labor and they tend to interfere with harvesting. All things considered, perhaps we should put more emphasis on pruning and reduce our props to firewood.

- - - - - - - - -

SUGGESTIONS ON THE CONTROL OF MICE IN ORCHARDS

The apple harvest this year got under way in most areas later than usual and, consequently, the hustle to complete harvesting will probably be greater than ever. After a busy harvest season it is natural that there be a let-down. It is unfortunate that this usually comes at the time when the work of controlling field mice in orchards occurs. Many unsuccessful results in controlling this rodent have been caused by failure to give proper supervision to this work. Workmen, who are trustworthy and conscientious, must be selected.

Control measures recommended for field mice are based on a knowledge of their habits and characteristics. The mere fact that the mouse does not like to come out in the open makes it necessary to place the bait in its runways, if efficient control is to be expected. That this increases the labor cost is unquestioned but any job worth doing is worth doing well. All growe whether old hands or new at this business of controlling field mice, should have on hand a copy of the leaflet "Mouse Control in Orchards", and should read it carefully.

On field trips to orchards last fall, it was noted that several orchardists were paring apples before applying rodenticide. This is not necessary. Other growers had become careless and were guessing at the amount of poison and bait used. Such methods not only increase the cost but decrease the effectiveness of the control method. An effective field mouse control program is less expensive than a haphazard one. Two or three trees damaged each year in a block of trees can, in a few years, put that orchard in the red. Let's make up our minds to do a thorough job of mouse control this year!

Carl B. Henry

- - - - - - -

Shrivelling in Storage. Like advancing age, certain things about fruits in storage creep up gradually and unawares. Shrivelling of apples is an example. That may be prevented almost 100%, even though the ripening process may only be retarded. Shrivelling begins immediately after harvest if apples are put into dry boxes. It proceeds rapidly if the storage air is also dry. Wetting down the floor, walls and the boxes themselves, frequently, is good insurance. A simple device for measuring relative humidity, such as a wet and dry bulb thermometer, is quite essential if there is any likelihood of apples giving up moisture to the containers and the surrounding air.

- - - - - - - - -

NOTES ON RAT CONTROL

Efficient rodent control methods are based on the habits and characteristics of the rodent to be controlled. The results obtained are usually in proportion to the amount of this knowledge that the operator has of the particular animal and how thoroughly he applies it.

Questions asked of rodent control agents at farm meetings can but lead to the belief that a far too large percentage of the people attending these meetings know very little of the life habits and characteristics of the most common farm rodents. For example, take the most damaging of all the rodents, the brown or Norway rat, and ask yourself these questions. If you can answer them, you should be able to control rats.

Where do rats live and breed? At what age does a rat breed? What is the largest opening allowable (round or square) to prevent rats from entering a building? What will a rat eat? What materials are ratproof? How high will a rat jump? How deep will a rat burrow? Will a rat take to the water readily? How far will a rat travel? Where do rats prefer to travel? What does a rat dislike most of all?

The last question is paramount. The rat dislikes most of all to be exposed. Thus the elimination of debris, proper storing of merchandise and the correct construction of buildings become of first importance. The farms which go from year to year without a rat or mouse problem are the ones that carry out a strict sanitation program. Doors must be fitted to the proper clearance and windows and other opening rat-proofed with the correct material. High grass, weeds and debris should be kept away from the exterior of buildings. More education on the habits and characteristics of rodents that damage farm crops and buildings could well be included in our agricultural school program.

Carl B. Henry and Charles C. Scott

- - - - - - - - -

Poultry Manure as an Orchard Fertilizer. Just because an occasional grower has used too much poultry manure in a bearing orchard does not mean that this material is completely ruled out as an orchard fertilizer. Applied sparingly and broadcast over the area between the trees, poultry manure works like magic in popping up a scanty cover crop. Where the trees are impoverished a little more may be applied as a means of encouraging the development of greener leaves which, in turn, will result in apples of slightly larger size, and more of them. The secret in getting ideal color of fruit, early maturity, and the finish which the market demands, is to place a definite limit on the amount used, far below the overdose which experience shows will result in a "henyard" type of apple. This apple is inclined to be late maturing, more spongy in texture, of much poorer color and, in general, unattractive.

- - - - - - - - -

Strawberry Leaves and Next Season's Crop. There is said to be a fairly close correlation between the number of vigorous leaves on a strawberry plant in September and the number of berries the plant produces the following June. This explains the disappointing yields of late formed runner plants and the bumper yields of well spaced plants which form their root systems in late July or early August.

- - - - - - -

Winter Fruit School. No plans have been made for a 1948 Fruit School thus far. Whether or not a School is held will depend in part on the prospective enrollment. Any reader of Fruit Notes interested in attending a School of from 3 to 5 days duration some time between January and April is invited to drop a card to W. H. Thies, Department of Pomology, University of Massachusetts. Please indicate (1) your preference as regards subjects, (2) number of students you represent, (3) month preferred, and (4) any other suggestions.

- - - - - - -

Perils in Pear Picking. In a recent issue of a Boston paper there appeared two items concerning elderly men who had suffered injuries in falling from ladders while picking pears. Doubtless similar stories about young or middle-aged apple pickers might be told. The harvest season invariably brings its list of casualties resulting from this once-a-year venture into the tops of tall trees. Pruners seldom show such a venturesome spirit. The lesson to be drawn from the harvest season casualty list is briefly this: Whenever a tree requires a ladder more than 20 feet in length, the owner should sharpen his saw and do one or more of the following: (1) cut out some of the trees entirely to prevent the others from reaching skyward, (2) if the trees are 40 years old and older make a start on removing the whole block, and (3) where spacing is satisfactory but tops are beyond reach, "top" the trees to a height of 15 to 17 feet. Winter injured Baldwin trees present a special hazard and should receive priority as regards the crosscut saw.

- - - - - - - -

Keeping "Posted". In the Middle West a thorny tree known as Osage Orange (Maclura pomifera) was very extensively planted years ago as a hedge to mark the boundaries of fields. As these trees were removed, they were cut up for fenceposts and are proving extremely durable. They are said to outlost the average farmer. One of the early nurseries in Iowa is reported to have sold nothing but Osage Orange trees.

- - - - - - - - -

Chokecherries Show Autumn Coloring in July. One doesn't have to wait until autumn to see reddish leaves along the roadside. As early as July the leaves of chokecherries infected with X-Disease show a distinctly reddish coloration. As a red flag denotes danger, so these reddish leaves send forth a warning to would-be peach growers in the vicinity. It is a waste of time and money to set peach trees where such an environment exists. If a peach orchard is already under way, all chokecherries within 200 yards should be sprayed with Amate in July, 1948.

- - - - - - - - - -

Mouse Guards Need Attention This Fall. Wire guards serve a useful purpose during the early life of an orchard, provided they are set low enough to prevent mice from getting underneath. But tree trunks increase in diameter while the guards remain as they were originally. Too often the grower goes along from year to year with a false sense of security. An 18-inch piece of 1/4-inch mesh wire can scarcely protect a tree with a trunk diameter of 7 inches because the diameter of the protective band is less than 6 inches. Sometimes the guard exerts a throttling effect. At other times it develops easy points of entrance for the ever watchful mouse. A watchful grower can avoid both of these conditions.

- - - - - - - - - -

A Bumper Strawberry Yield. Most strawberry growers are content if they harvest one quart of berries per original "mother" plant. On that basis, an acre requiring approximately 5000 plants might be expected to yield about that number of quarts of berries the following season. Last summer a home planting of about 1/10 acre involving 500 plants on the property of County Agricultural Agent Stanley L. Burt in Sunderland yielded 1118 quarts, or more than 2 quarts per plant. Can anyone "top" this?

- - - - - - - - - -

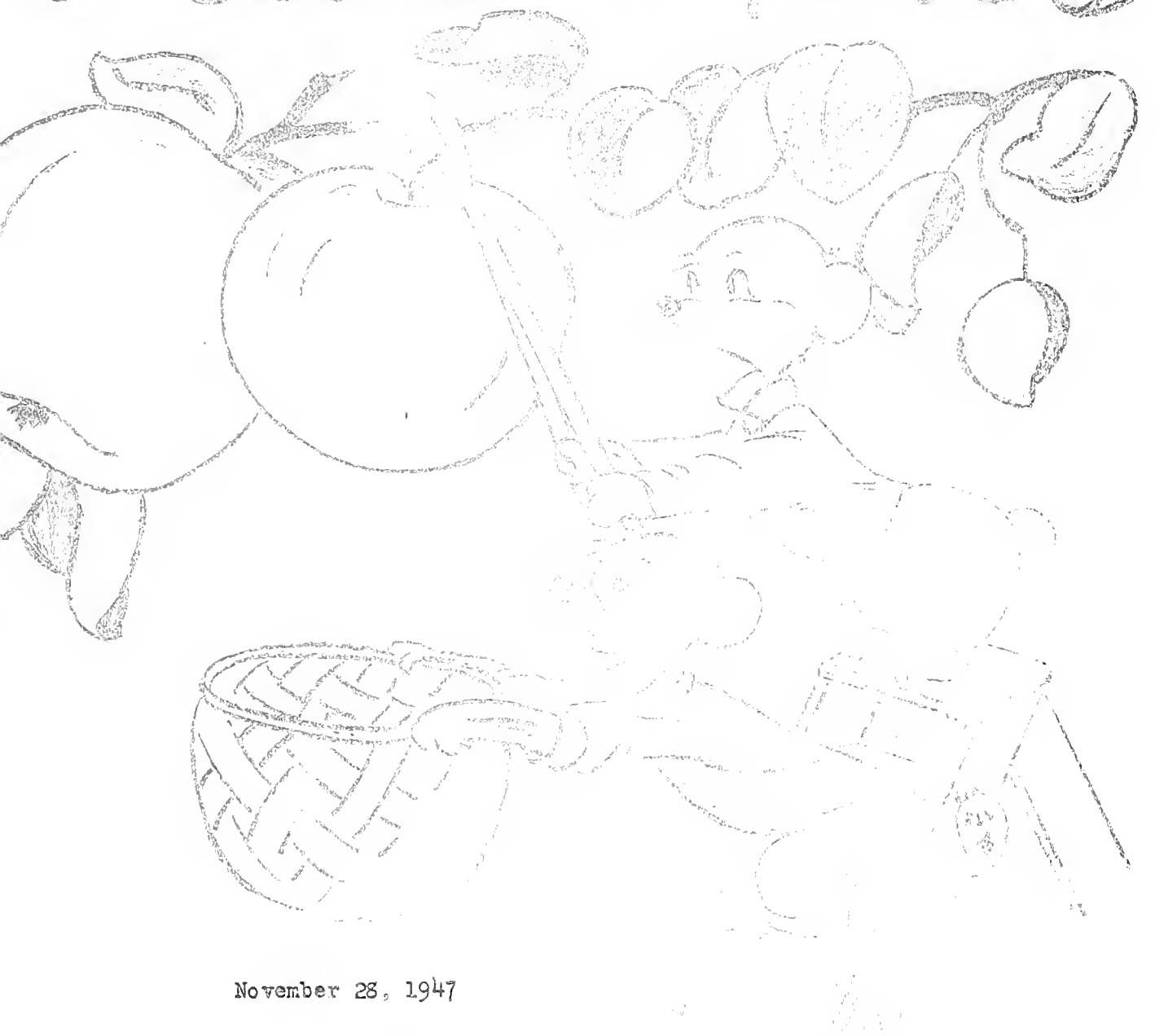
Tour of By-Products Plants. Before this issue of Fruit Notes is received, notices of an interesting tour to be held in late October will be mailed to members of the M.F.G.A. by Secretary W. P. Cole. An opportunity will be offered to see modern equipment in operation in Ayer, Littleton, and Westford. It looks like a very worth while tour.

- - - - - - - - - -

The Odd Variety Season. Every day brings to the University specimens of apples for identification. An apple of the Ewalt variety, an old forgotten apple, arrived from two different individuals on successive days.

- - - - - - - - -

Fruit Notes



November 28, 1947

Prepared by the Fruit Program Committee of [illegible]
W. H. Thies, Extension Horticulturist

Contents

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

THE RED APPLE CLUB

Twenty-one Massachusetts growers have qualified for membership in a new "honorary fraternity" known as the Red Apple Club. This new project emphasizes three important factors in orcharding; namely, control of insects and diseases, fruit color, and yield. In order to qualify, the crop must (1) be at least 90% free from insect and disease blemishes, (2) grade at least 60% U. S. Fancy, and (3) amount to at least 400 bushels per acre if trees are 20 years old or older, 300 bushels per acre if trees are 15 to 20 years old and 200 bushels per acre if trees are less than 15 years old.

Inspection of the apple crop is made on the basis of a carefully taken sample amounting to about 5 bushels, each apple being examined for preventable blemishes and for color. In a large orchard comprising several blocks and several varieties it would obviously be difficult to obtain a sample which would be representative of all the apples on the farm. Hence the grower is permitted to ask for an examination of the fruit in one particular block, so long as it contains at least one acre. In most cases, the samples have represented a block of 5 acres or more. Membership in the Red Apple Club is distributed as follows: Worcester County - 5, Hampden and Middlesex - 4 each, Hampshire and Essex - 2 each, Berkshire, Bristol, Franklin and Norfolk - 1 each. A certificate of membership will be presented by the Massachusetts Fruit Growers' Association at the Annual Meeting in January.

****

MULCH CONSERVES MOISTURE

The recent prolonged drought gave an excellent opportunity to check on the value of mulch as a conserver of soil moisture. On October 27, just before the heavy rain of the 30th and 31st, soil samples were taken in a raspberry planting half of which was mulched and half of which was not. The soil under the mulched half was cool and moist to the touch. There was moisture enough present so the soil adhered well to the soil auger and no difficulty was experienced in getting samples. Where the mulch was heavy and thick, about 8-10 inches, the soil appeared more moist than where the mulch was thinner, 3-4 inches.

On the unmulched half the condition was quite different. The soil was so dry that it wouldn't stick to the soil auger. It ran off like sand. When the several samples were dried and weighed, it was found that the soil under the mulch had an average moisture content of 22 percent, just twice that of the unmulched soil which was 11 percent.

Although the recent rains have helped, the soil in some places is still pretty dry. Unless there is considerable rainfall before the ground freezes, trees may go into the winter in an unsatisfactory condition. A little dry weather in the fall to slow up growth and make the trees harden their wood for winter is a good thing. But like other good things, it can be overdone. If trees go into the winter in too dry a condition, cold, dry winds can do severe damage, at least to fruits or varieties which are not particularly winter hardy. Perhaps this is the year when mulch will pay an extra dividend by reducing the amount or severity of winter injury.

-- J. S. Bailey

****

CODLING MOTH AND 1947 EXPERIMENTS

Apples in the experimental orchard at the Waltham Field Station had the greatest infestation of codling moth in 1947 that has been recorded in 22 years - BUT ONLY IN ONE BLOCK. That block was sprayed with benzene hexachloride, an insecticide noted for its short period of effectiveness and one which is not considered especially effective against this pest. The blocks where DDT or lead arsenate, either alone or in combination, was used were either entirely free or had an insignificant infestation averaging less than 3 codling worm stings per 1,000 apples.

Since all of the blocks were sprayed on the same day, we must assume that the timing of the applications in the spray schedule was satisfactory, at least where DDT or lead arsenate was used.

The dates of application were:

First Cover	June 4
Extra Curculio	June 10
Second Cover	June 23
Third Cover	July 11
Fourth Cover	July 30

Compare these dates with your application periods, naturally allowing a few days for climatic differences between your orchard and Waltham.

Most of the worm injury occurred in July from late hatching first brood worms, and the sprays on June 23 and July 11 were the most critical. Obviously the extended periods of hot, dry weather favored codling moth development, but even so a reasonable spray schedule should have given reasonable results.

DDT continues to prove its effectiveness against codling moth and personally I believe that a combination of lead arsenate 2 pounds, 50% DDT wettable powder 2 pounds in 100 gallons of spray is the most effective formula of insecticide for ALL COVER SPRAYS.

Could it be that the old familiar bug-a-boo of inadequate coverage is still the cause of trouble?

-- W. D. Whitcomb

****

STUDIES ON APPLE SCAB AT THE WALTHAM FIELD STATION

Our plan of study was designed to clarify our knowledge of Phygon and Puratized Agricultural Spray. The interest in these materials seemed dominating.

Our work in 1946 revealed the astonishing fungicidal action of Phygon, at 1 lb. to 100 gallons of water. Our work in 1947 gave similar astonishing results in the control of apple scab with Phygon 1/2 lb. to 100 gallons of water. In 1946, Phygon caused some degeneration of the green matter in the leaves and there was indication of a decrease in size of individual fruits. This year 1/2 lb. of Phygon caused similar foliage injury whether one or more sprays were applied. Is the injury serious? Is the effect from the pre-blossom applications more or less than the post blossom applications? Can the injurious element be buffered by the addition of a corrective? These are questions that only further study can answer and the help of chemistry is needed. Injury to the face and hands from contact

with Phygon was experienced by some growers. Howard Gilmore offers an ingenious "Pay Mountain Method" of overcoming this problem, - "Fill the spray tank with water; then place the bag of Phygon under water and empty its contents". There is nothing gained by first making a slurry of the material. At Waltham we dumped the Phygon into the tank.

It has been claimed that sulfur and lime depreciate the action of Puratized Agricultural Spray. Extensive laboratory and orchard studies indicate that these claims are exaggerated and even doubtful. Puratized and paste sulfur combined performed about the same as or a little better than Puratized, or Puratized and dry wettable sulfur combined. Puratized and Fermate combined was highly effective and virtually the same as paste sulfur alone. Considering all of our results (small and large scale tests), Puratized with lime, and without, showed no significant difference. Our tabulation of apples for scab is as follows:

Treatment	% Scabby Apples			
	McIntosh	Delicious	E. McIntosh	Kendall
Puratized, 1 pint	2.23	3.65	0.0	0.5
Paste Sulfur, 11.75 lbs.	.20	0.0	0.0	0.8
No treatment	90.68	71.26		
Puratized, 1/2 pint Paste Sulfur, 5.87 lbs.	1.04	1.0	0.19	0.5
Puratized, 1 pint Lime, 3 lbs.	6.97	2.42	0.70	1.5
Puratized, 1/2 pint Kolo Spray, 3.5 lbs.	4.95	2.55	0.47	3.6
Phygon, 1/2 lb.	.06	0.0		
Puratized, 1/2 pint Fermate, 1/2 lb.	.46	0.0	0.0	0.3

The early protectant sulfur sprays should carry at least 6 lbs. of actual sulfur to 100 gallons. For 50% Paste sulfur the equivalent is 12 lbs. of paste. For 70% Paste sulfur the equivalent is 8.6 lbs. of paste. Though some allowance may be made for the finer particle size, peculiar to paste sulfurs, it is nevertheless desirable to provide at least 6 lbs. of sulfur to 100 gallons in the early sprays.

-- E. F. Guba

****

ARE WE COMING TO BIOLOGICAL CONTROL OF PLANT DISEASES?

Combatting insect pests and plant diseases with living organisms comes under the category of biological control. The action of ladybug predators on aphids, and the Macrocentrus parasites on the larvae of the Oriental fruit moth are examples of insects controlling insects. Employing the "milky disease" against

the Japanese beetle grubs typifies insect control with a specific bacterial organism. The destruction of plant lice by certain species of fungi illustrates biological control by pathogenic forms of fungi.

In the realm of microscopic life, nematodes have been found to pierce the cells of fungus threads and suck out the contents. Aside from the direct attack of one fungus upon another, the mere presence of many fungi and bacteria is able to suppress or completely inhibit the growth of other micro-organisms by the action of certain soluble excretions or growth by-products. Penicillin is such a substance produced and released by members of the Penicillium fungi, and is well known to be deadly to many disease-producing bacteria of humans.

Streptomycin is a still more recent "drug", produced by the fungus-like organism, Streptomyces, which will destroy certain disease bacteria that penicillin will not affect. In recent years, plant pathologists have experimented with these so-called "drugs", and some interesting information is forthcoming with the use of streptomycin. A pathologist in California found that streptomycin readily kills the different bacterial organisms that cause fire blight, tomato bacterial canker, bacterial leaf spot of carrot, potato scab, bean blight and still others.

Plant pathologists in Wisconsin reported recently how they obtained a similar extract from Streptomyces and completely inhibited growth of the apple scab and peach brown rot fungi in laboratory cultures with dilutions as high as one to 8 million. In greenhouse tests, infection of susceptible apple leaves by apple scab was greatly reduced or prevented outright by spraying them with a water dilution of streptomycin 4 hours, also 4 days, before inoculation with the scab spores.

This appears to be a new angle to the use of organic fungicides for plant disease control, -- or is it a type of biological control?

-- O. C. Boyd

****

A NOTE ON HAND POLLINATION

The following comments on a new method of insuring pollination were recently made by Ben Drew of Westford: "We secured definite evidence that our hand-pollinating efforts resulted in more apples per tree, than on those trees not hand-pollinated, but the difference was so slight that we need to know a lot more about the many factors involved, particularly the timing, before trying this on a larger scale.

"We treated about an acre of large trees (McIntosh) with our self-collected pollen from Astrachan blossoms, using small camel-hair brushes."

****

GALBRAITH BALDWIN, A PROMISING RED SPORT

In 1934, a small branch on a Baldwin tree located in Block O, one of the old experimental blocks of the Massachusetts Agricultural Experiment Station, was observed to produce five highly colored apples. This branch was first noticed by Floyd Galbraith who worked in the Station orchards at that time. The sport has since been called "Galbraith".

One year shoots from the sporting branch were top-grafted on a tree in the spring of 1935 to see if the high color could be maintained. After the grafts had been known to produce highly colored apples, trees were propagated from them and planted in a new stock orchard. The trees were planted in 1939 and have now borne two crops of highly colored apples in contrast to regular Baldwins growing adjacent to them.

About two weeks before Baldwin harvest the Galbraith Baldwin takes on considerable red color and by harvest time it is an over-all red which extends all the way into the calyx end of the apple. The red is of medium shade, not quite as bright as Gallia Beauty nor as dark as Starking. It is very attractive and has a certain snap to it. The apples appear to be the same as regular Baldwin in all respects except color. Galbraith Baldwin apples have a uniform shade of red in contrast to regular Baldwin which may vary from dark to bright and snappy to dull.

While the popularity of Baldwin has declined slightly in recent years, the Galbraith strain of Baldwin appears to be superior to any Baldwin now being propagated and certainly is worthy of consideration by those who wish to continue growing the variety.

-- W. D. Weeks

****

PRELIMINARY PLANNING FOR A FRUIT STORAGE

There are several important factors to consider in planning a fruit storage with packing facilities. These in a reasonable order include: circulation; type of structure; materials; cost; and operating costs. The item of circulation can be reasoned by making small sketches of different ideas and tracing the lanes or routes over which products and men must move to, within, and out of the storage and packing areas. Herein lies the greatest planning difficulty, but until the shortest and most sensible routing is devised for every operation the entire layout may contain "bugs" which will always remain to cause wasted time and extra expense. Routing from orchard to building must be planned stop by step through unloading, motions within the storage, both horizontally and vertically, to coordinate with the easy meeting of empty boxes, grading, covering, return to storage or movement directly to market. Good routing or circulation shows up when the directions are continuously one way with the absolute minimum of cross traffic and wasted motions.

Naturally the type of structure will depend upon the kind of operations the grower intends to pursue. If he stores and cools fruit before grading and sale, the plan will be different than if he first grades, cools, and sells. The same becomes true for any other combination. He may prefer to carry on his business using several methods which will require most careful consideration to make all parts work well. For some to place the grading room along side of the storage may be quite ideal, but perhaps not best for others who may find it better to plan the grading room in line with the storage.

Materials and costs go hand in hand. Availability of these and skilled labor make a good combination. Unusual materials along with labor unfamiliar with these mean higher costs. Maintenance, insurance, and depreciation can be large or small. Substantial materials and construction are generally real economies in the long run.

A considerable part of the operating costs can be determined before building. Of these the question of amount of insulation versus size of refrigerating machinery enters strongly. When insulation materials are rather high in cost it may be cheaper to use less of these and install a larger cooling unit. The reverse holds true at other times. Running costs of the larger unit are seldom too important. Which to choose, because conditions do change, may be decided on the "first cost" basis.

Wasted motions because of poor planning will always be costly. The real secret to economy of structure and labor hinges upon good preliminary planning.

-- M. J. Markuson

****

THE BUILDING SITUATION

In ten years the value of farm structures has doubled. This is due in part to the decreased purchasing value of the dollar, to the scarcity of lumber and the relatively high costs of labor. To replace these buildings would cost three times their former value. These are round figures. Close estimates are difficult to obtain because of the confusing building situation.

One of the greatest tragedies that can befall a farmer is loss of his structures including contents by fire. One farmer out of every forty is visited by fire every year and about half of those visited have serious or crippling losses according to Howard Russell, Chairman of the Farm Fire Prevention Committee. The farmer can do two things which will reduce these losses. He can heed the precautions directed to farm men and women prepared by the Farm Fire Prevention Committee and he can carry adequate insurance on his buildings and contents. Farmers who are careful, thoughtful, and fire conscious and whose employees are trained similarly, generally have a better record of losses by accident and fire than those who disregard warnings, instructions and suggestions for safety.

Building materials are becoming more plentiful as production is increasing but scarcities will exist until the needs of housing become more normal. It is likely that prices of labor and materials will stay high for several months at least. It is always a matter of conjecture when and how much prices will fall. It is most unlikely that prices will ever drop to the level of the thirties because of the permanently reduced purchasing value of the dollar.

Whether one should build at the present time or not depends on many factors. If his business is such that he can reap quick and large profits sufficient to warrant the structure and can liquidate the business quickly, the investment in a structure may be warranted. On the other hand, the probable income from many New England farms will not justify the present high cost of construction. When construction can be deferred, it is usually advisable to do so.

Masonry walls for farm structures are becoming more common. Many farmers have said that the use of cinder block masonry in construction compares favorably with wood frame construction. Wood masonry requires two coats of a water-proof cement paint applied with a scrub brush, otherwise the walls will absorb dampness from the rain.

-- W. C. Harrington

****

STATE FIRE PREVENTION PROGRAM

At the Fire Prevention Conference called in Washington last spring by President Truman, the governors of each state were asked to call similar meetings on a state-wide basis. Accordingly, His Excellency, Governor Bradford, requested that every organization interested in either fire prevention or fire protection be present at a conference at the State House on October 27, and indicate what the organization could and would do to reduce the waste resulting from farm fires.

The magnitude of our collective farm fire losses is almost astounding--approximately $1,000,000 annually, with losses from a few dollars per farm to perhaps $20,000 or $25,000. These losses are divided so that farmers each pay on an average from $25 to $50 annually.

Unfortunately farmers are never fully reimbursed from losses by fire as buildings are usually insured for only a fraction of their present day worth and an even smaller fraction of their replacement value. The same also holds true for the cattle, crops, feed, machinery, and equipment either stored or a part of the structure. Other losses are interruption of the year's income and inconveniences which last until replacements are completed.

The fire prevention committee specifically recommended in its report to the Governor, the following:

To FARMERS: Prevention

1. Make all chimneys and smokepipes safe by cleaning, pointing, rebuilding or renewing. Provide one foot clearance between smokepipes and woodwork or provide adequate insulation.

2. Have electric wiring and equipment inspected by a power company representative, or a competent licensed electrician; increase size of wires and number of circuits where needed; add new circuits for new equipment. Use time-delay fuses of proper size on all motors.

3. Forbid smoking in all farm buildings except the dwelling.

4. Install lightning rods according to Master Label Standards and keep them effective.

5. Consult with your power company representative before buying welders and other heavy duty equipment.

6. Dry hay thoroughly before storing; use thermostatic fire detectors and watch for heating.

7. Cover all buildings with non-combustible roofing.

8. Keep premises clean. Clear all brush, weeds, and litter for a distance of 100 ft. from buildings to avoid conflagration from forest and grass fires.

9. Install main switch near entrance of barn, so that electricity may be cut off outbuildings at night.

10. Request an inspection of your property by the local fire chief and follow his recommendations.

To FARMERS: Protection

1. Provide and make available water for fire department; as an easily reached farm water hole, reservoir, or cistern, unless public hydrants exist.

2. Keep fire extinguishers on hand and recharge periodically.

3. Keep light ladders with roof hook and garden hose available.

4. Keep spray machines full of water and ready for use except in freezing weather.

To FARM WOMEN: Prevention

1. Plan how to get your family out in case of fire at night.

2. Never use gasoline inside the house.

3. Never use kerosene to start or accelerate a fire.

To FARM WOMEN: Protection

1. Have a fire extinguisher on each floor and learn how to use it.

2. Keep baking soda or a carbon tetrachloride extinguisher in kitchen for grease fires.

3. Use care with matches and all electric appliances.

4. Keep basements and attics free from rubbish, and keep all electrical equipment in good repair.

-- W. C. Harrington

****

GROWING ADDITIONAL MULCH MATERIAL

There are at least 3 ways of securing mulch material for us in an orchard. They are: (1) Producing the material between the trees; (2) Producing the mulch on other areas of the farm to be cut and hauled into the orchard; (3) Purchasing straw, hay, or other material from outside sources. The possibilities under (1) and (2) are very often neglected although there is reason to believe that in many cases two dollars worth of mulch material may be grown for each dollar invested in fertilizers.

In an Ohio experiment where the soil tested about pH 5, no fertilizer at all resulted in a yield of mulch material consisting of mixed grasses, amounting to 1573 pounds per acre. Where 200 pounds of Cyanamid per acre was applied, the yield on 5 different plots ranged from 3933 to 4689 pounds per acre. Where 400 pounds of Cyanamid was applied, the yield amounted to 5143 pounds per acre. High magnesium lime nitrogenous fertilizers including poultry manure and "complete" fertilizers are among the possibilities for stepping up the yield of vegetation in many Massachusetts orchards.

****

REPORT ON 1947 NURSERY INSPECTION TRIP

The nursery inspection job in 1947 was the largest and most extensive undertaken so far. It included the states of Massachusetts, Connecticut, New York, Pennsylvania, Ohio, Michigan, Iowa, Missouri, Alabama, Tennessee, Virginia, Maryland, and Delaware. In all, 32 nurseries were examined including most of the larger nurseries in these states. Six inspectors participated in the work which extended over 8 weeks and covered 6500 miles of travel. It took 981 man-hours of actual working time at a total cost, including travel, of almost $3,000 to do the job. As nearly as we can estimate, we have examined between 3 1/2 and 4 million apple trees as well as perhaps a million pear, plum and cherry this past summer. Of this number about 75,000 were misnamed trees.

No inspection work was done on peaches in 1947 due mostly to lack of time. Each year brings in some new requests from nurserymen for this service. We are trying to find and train a sufficiently large crew of inspectors to handle all requests. In the meantime, we are doing the best we can and giving service where the most can be accomplished.

-- A. P. French

****

FURTHER SUGGESTIONS ON MOUSE CONTROL

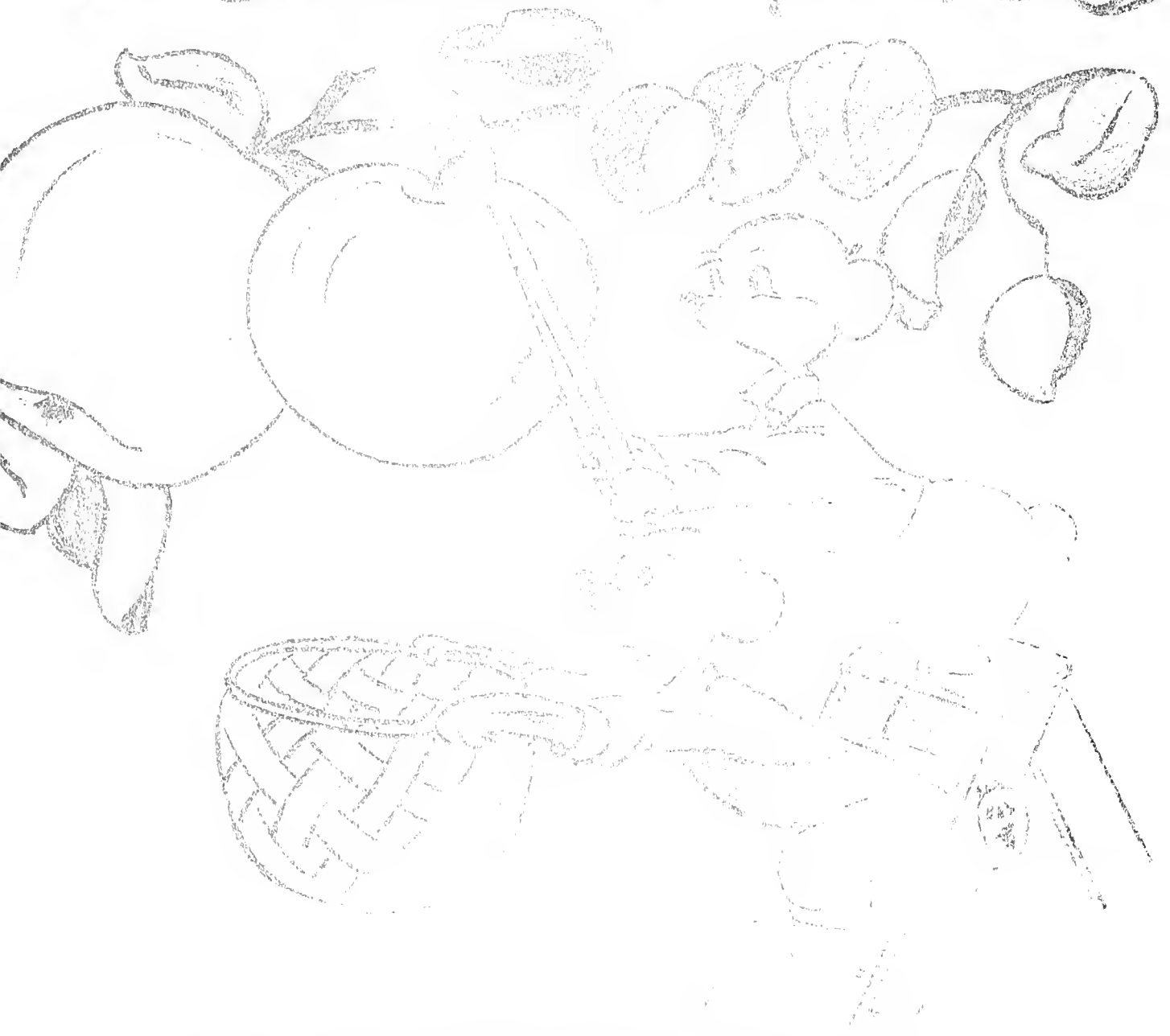
The following questions may be of some help in reviewing the mouse control program. If a grower can truthfully say "Yes" to each question, then at least one of his fruit growing worries is lessened.

1. Have the dropped apples been picked up throughout the entire orchard? If they have, is it known in what sections the most nibbled apples were found?
2. Has every block in the orchard been carefully checked to determine the degree of mouse infestation and have the most heavily infested areas been noted?
3. Were active mouse signs, such as fresh grass clippings, smoothly worn runways, and nibbled apples, looked for or was the mouse infestation determined from casual observations while working at some other job?
4. Will it be safe to leave the tall grass or weeds that are growing close to the tree trunks?
5. Is there a supply of rodenticide or zinc phosphide treated steam crushed oats bait on hand?
6. Was rodenticide used at the rate of one level teaspoonful to one quart of cut apple bait? Was it accurately measured?
7. Were all areas in and around the orchard, where mice have protective cover, baited, as well as the area within the drip line?
8. Are the wire tree-guards in good order, set well in the groun and no openings where wire is joined together?
9. Have the hired hands, doing this work, been properly supervised and thoroughly instructed? (a) Can they distinguish an active mouse runway from an inactive one? (b) Do they know the most likely places to look for mouse activity? (c) Have they been impressed with the importance of this annual orchard problem?

Any grower can check the results of his efforts by spending a little time trapping, particularly in areas where there is some doubt as to how well the work was done.

-- Carl B. Henry

Fruit Notes



Prepared by the Fruit Crops Specialists of the Massachusetts Extension Service
W. H. Baker, Extension Horticulturist

December 30, 1947

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

NEW USES FOR DECIDUOUS FRUITS:

The need for new and wider markets for deciduous fruits, particularly those portions of these fruits that are sometimes wasted, has caused the U.S. Dept. of Agriculture to undertake a long-time project under the Research and Marketing Act in the hope of expanding the outlets for these products. It is estimated that around one-sixth of this country's apple crop is either wasted or brings a very low price because the apples are undersize, offshape, or have some other defects that make them less desirable for the fresh fruit market. Similar wastes occur in the production of practically all of the other deciduous fruits.

The research will be conducted by the Bureau of Agricultural and Industrial Chemistry's Eastern Regional Research Laboratory in Philadelphia, and its Western Regional Research Laboratory at Albany, Calif., in cooperation with the Virginia Agricultural Experiment Station at Blacksburg, Va., and possibly other experiment stations. Studies will be made on peaches, pears, apricots, plums, cherries, grapes, and berries.

This work is being undertaken largely as a result of the success the Eastern Regional Research Laboratory has had during the past few years in finding new outlets for apple products. Of the 18 products now being made commercially from apples, two of them, apple concentrate and apple-flavoring essence, were developed in the Eastern Laboratory. The apple essence has received a particularly enthusiastic commercial acceptance, and is being used in the manufacture of candies, soft drinks, jellies, and other products that lose flavor during cooking.

* *

SEEPAGE SPOTS IN ORCHARDS

On many hillside orchards farmers are troubled by wet spots caused by underground seepage. Underground water tends to follow along a hardpan or clay layer (See Fig. 1) and when this layer comes close to the surface, water seeps out and keeps the ground below wet. Occasionally these spots become so wet that they are a costly nuisance - bogging down equipment and keeping some trees from reaching maximum production.

In general (See Fig. 1) the solution is to intercept this underground seepage water by a tile line around the slope. The assistance of someone experienced in this type of work is usually necessary since test holes must be dug to locate the sub-surface flow before excavation is started for the tile line.

The intercepting tile must be installed above the wet spot at a place where the impervious layer is below frost line, preferably more than 30" below the ground level. Tile laid in this manner should have a grade between .1% and .5%.

When water from the intercepting tile must be emptied at the bottom of a steep grade, bell tile should be used as a conduit. On steep grades land tile is likely to cause subsurface washing along its path. Generally, at least two concrete collars are necessary on the bell tile conduit - one where the tile system joins it and the other at the outlet (See Fig. 2).

Assistance for this type of work has already been furnished by technicians of the Soil Conservation Service working through local Soil Conservation Districts.

Benjamin Isgur
District Conservationist

* *

Cause of Seepy Area: - hardpan layer coming close to surface of soil at break in slope

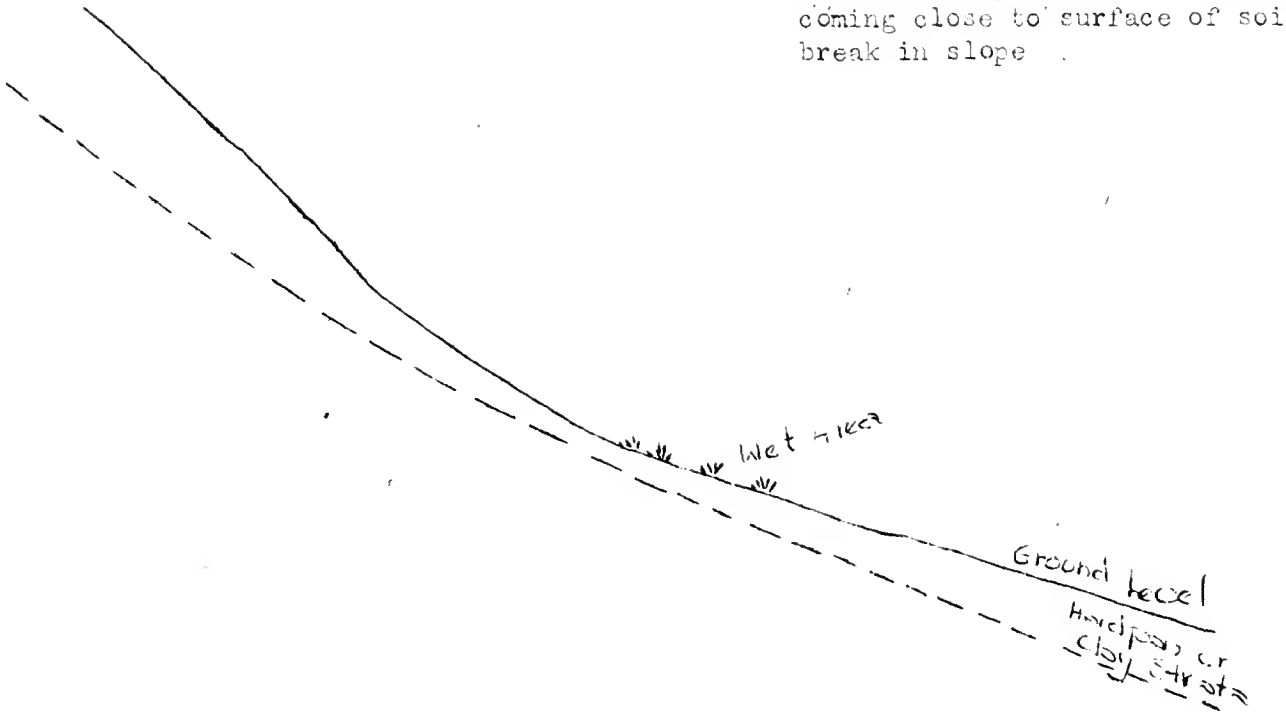
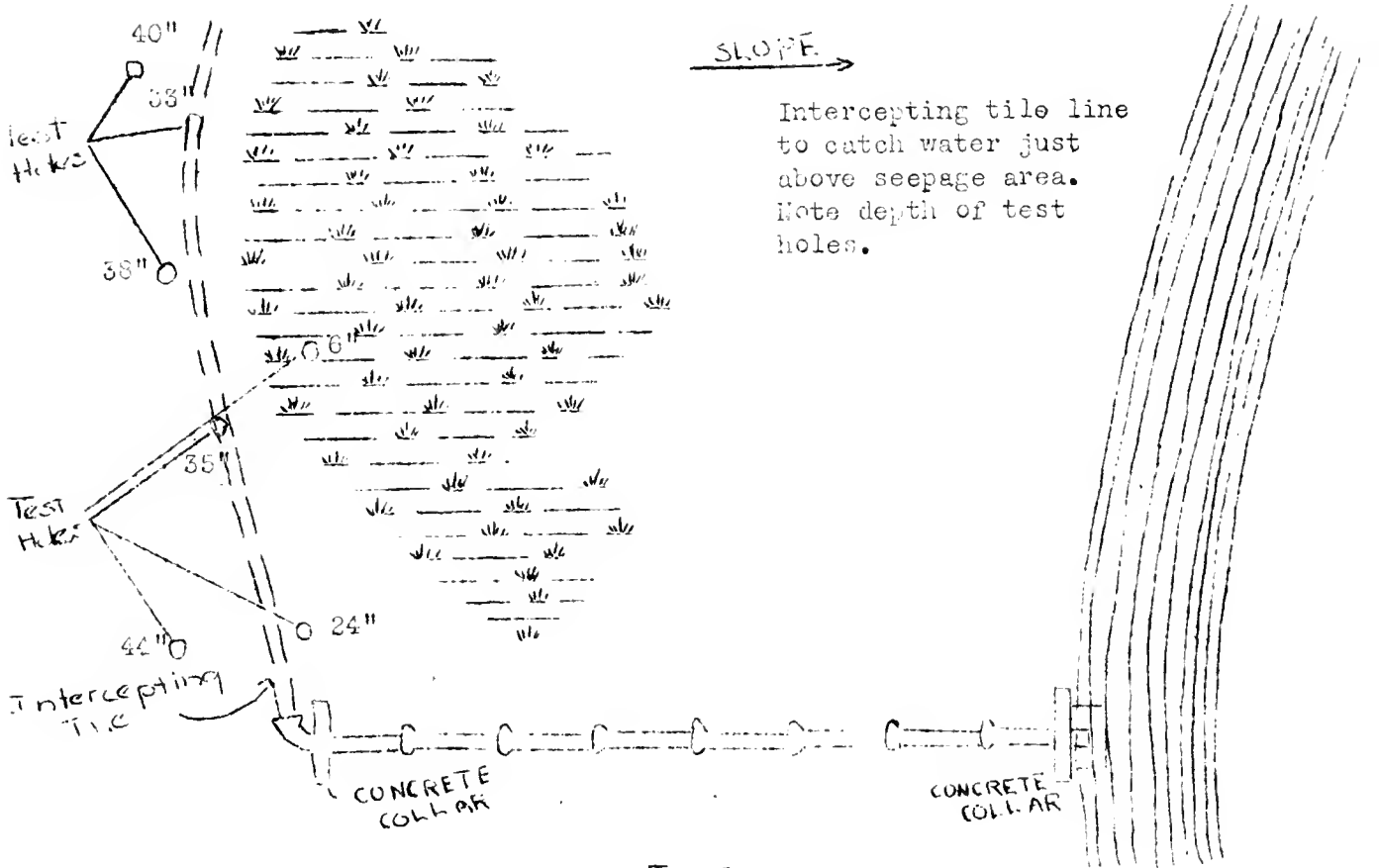


Fig 1



Intercepting tile line to catch water just above seepage area. Note depth of test holes.

Fig 2

SHALL WE PLANT ORCHARDS ON THE CONTOUR

Contour planting is almost a necessity for the average cultivated New England orchard. We have all seen what has happened to the soil of many a peach orchard where no special precaution against erosion was taken. It has happened in apple orchards, too, and one writer recently referred to the apple grower as the "most myopic of all in this matter of soil conservation".

Nevertheless, we must admit that it is not imperative that orchards in complete sod be planted on the contour. For sod orchards on slight slopes, there is no advantage from contour planting, but there is benefit if the orchard is cultivated as a whole or in strips. Cultivation is sometimes practiced in young apple orchards and omitted as the trees approach maturity. There is no question about the advantage of contour planting where soil erosion is a problem.

Many New England orchards are on slopes of 10 to 15%. I have seen them on slopes above 20%. There are good reasons why some of the best orchard sites are on sloping land. It happens that some of the best apple soils of this section have a characteristically sloping topography, and furthermore such topography promotes good soil and water drainage. On slopes above 10%, it is both difficult and expensive to operate tractor-drawn equipment, and above 20% such operation is almost prohibitive. Engineers tell us that contour farming saves from 10 to 12% in time and 9 to 10% in fuel and oil over up-and-down-hill operations, and there is less wear and tear of equipment, to say nothing of being easier on the operator. On the lesser slopes, contour planting may mean the sacrifice of one degree of freedom of movement of equipment through the orchard, but on the steeper slopes the direction of movement is pretty well determined by nature. I have seen orchards on such steep slopes that it was impracticable to move equipment up and down the slopes and where movement was as near on the contour as the layout of the orchard would permit. It might better have been laid out on the contour in the first place; it cannot be done afterward.

Contour planting should be considered only as a means to an end. It is not itself a method of erosion control, but it gives a basic framework on which conservation practices such as terracing, ridging, simple contour cultivation and strip cultivation may be planned and carried out.

Then there is the question of road location. Nearly every orchardist knows the problem of road erosion on sloping land. Sometimes it becomes so serious that it is necessary to relocate the roads. Considerable thought should be given to lanning orchard roads so as to reduce erosion of them to a minimum. So far as possible, they should be on the contour. This usually means longer roads, but the "longest way around is sometimes the shortest way through".

Space does not permit our going further into the pros and cons of contour planting of orchards, nor of giving details of methods. Orchardists desiring more on the subject, particularly those who are contemplating planting an orchard, might well consult two good publications in this field, namely: "Soil Management Practices in the Orchard", Michigan Experiment Station Circular Bulletin 199; and "Conserving Soil and Moisture in Orchards and Vineyards", Farmers' Bulletin 1970.

Technicians of the Soil Conservation Service will give technical assistance to orchardists interested in developing conservation plans for orchards. Applications for assistance should be made to the board of supervisors of the soil conservation district in which you live. For further information as to procedure consult your county agricultural agent.

A. B. Beaumont
State Soil Conservationist

EVALUATION OF INSECTICIDES FOR APPLE INSECT CONTROL

CONTROL OF		OIL EMULSIONS	DI-NITRO	LEAD ARSENATE	DDT	NICOTINE	BHC	HETP	PREFERRED
Red Mite	Dormant	Good	Poor	---	---	Poor	Unknown	Unknown	Oil Emulsion
	Summer	Good	Good	---	Poor	Poor	Fair	Good	Dinitros
Aphis	Dormant	Fair	Good	---	---	Good	Unknown	Unknown	Dinitros
	Summer	Fair	Fair	---	Poor	Good	Good	Good	Nicotine
Plum Curculio		---	---	Good	Poor	---	Fair	Good	Lead Arsenate-DDT Combination
Codling Moth		Fair (Ovicide)	---	Fair	Good	Fair (Ovicide & Contact)	Poor	Unknown	DDT
Maggot Fly		---	---	Good	Good	---	Fair	Unknown	Lead Arsenate
Bud Moth	Dormant	Fair	Good						Dinitro
	Summer			Good	Fair	Good	Unknown	Unknown	Lead Arsenate
Leafhopper		---	Fair	---	Good	Good	Fair	Good	DDT
Red Banded Leafroller		---	---	Good	Poor	---	Unknown	Unknown	Lead Arsenate
EFFECT ON	Foliage	Safe*	Safe*	Safe*	Safe	Safe	Safe	Safe	*Safe in favorable weather; hot, muggy weather induces injury.
	Fruit	Dull	Safe	Safe	Safe	Safe	Safe	Safe	
	Bees	None	None	Injurious	Sl.inj.	Repellent	Sl.inj.	Sl.inj.	
	Operator	None	Caustic	None	None	Bad	Disagreeable	Bad	
COMPATIBILITY		Limited	Limited	Sl.Limited	Good	Good	Good	Good	
COST		Low	Moderate	Low	Moderate	High	Moderate	High	

W. D. Whitcomb

EVALUATION OF PURATIZED AGRICULTURAL SPRAY AS AN ERADICANT FOR APPLE SCAB

Science has been searching for the ideal fungicide for controlling apple scab. Since 1908 when liquid lime sulfur came into use as a fungicide for scab, to replace Bordeaux mixture, notable progress has been made in this direction. This article is written to consider the usefulness and limitations of Puratized Agricultural Spray.

This material has good scab-protective and curative values. It is expensive. As a protectant for scab it gives no better control than high grade wettable sulfur, which is much cheaper. For that reason its use as a protectant spray is not encouraging. Under most conditions it is non-injurious to the trees and it is compatible with sulfur, Fermate, Nicotine sulfate and lead arsenate. As a curative spray for scab, on the basis of the writer's research work at Waltham, it is superior to liquid lime sulfur, its only competitor. However, its action as an eradicant or curative is intriguing. Inconsistent curative results are reported by growers, and to explain these discrepancies statements have been made that sulfur, lime, hard water, magnesium and clay in the water invalidate or depreciate the toxicity of Puratized. Some of us even think that the variable results are due in part to the age of the scab spots, the younger infections yielding and the older ones not yielding; also that the absorption of Puratized by the scab fungus in lethal amounts is influenced by the physiology of the scab fungus or the leaf cells on which it forages. Changes in the chemical composition of the product itself cannot be ignored in searching for the answer to the problem.

The age of the scab lesion is not necessarily a criterion. Scab spores in all ages of foliage lesions are killed. Nevertheless, it is best to spray the trees to eradicate scab at the calyx period or very soon thereafter to prevent the scab from parasitizing the leaf tissue to the killing point, and from sporulating further.

Puratized Agricultural Spray should not be used after June 15 nor beyond 20 days after calyx. This is a precautionary measure intended to prevent any possibility of tainting the harvested fruit with mercury. Since in this period both primary and secondary scab of various ages of infection are apparent, this is the appropriate period to eradicate foliage spots. Eradication of these infections with Puratized is ultimately complete.

The lethal action of Puratized on the scab fungus is not necessarily immediate. Many growers have been disappointed because spore germination tests after treatment have indicated a negative or incomplete result. Eventually and in most cases, however, scab is satisfactorily arrested.

There is indication that lime and bentonite weaken the action of Puratized. The addition of one half the formula of wettable sulfur to 1 pint of Puratized can be an advantage on the basis of tests in 1947. Paste sulfur or a high grade dry wettable sulfur free of bentonite or similar inert material is preferred. Fermate 1/2 lb. may be substituted for sulfur with the promise of even better control of foliage scab.

Puratized Agricultural Spray is a good protectant against fruit scab but it will not eradicate it. Obviously then it is important to apply the Puratized eradicant spray at calyx or soon thereafter to keep foliage scab from spreading to the fruit.

Finally we are still searching to learn why the 1946 and 1947 productions of Puratized Agricultural Spray used at the rate of 1 pint in 100 gallons have not eradicated scab as promptly nor as completely as the more concentrated 1945 Puratized N5E, used at the rate of 1/2 pint to 100 gallons water.

E. F. Guba

Land Clearing

A new publication, "Clearing and Improvement of Farm Land in Massachusetts" is now available through the Mailing Room at the University of Massachusetts or your County Extension Office. Just ask for Bulletin No. 439. Quoting from the cover page, "The primary purposes of this study have been to appraise the methods used in land improvement, to evaluate the results in terms of cost-benefit comparisons, and to study the significance of land reclamation for the future of agriculture in Massachusetts". Any fruit grower interested in clearing additional land or improving land now in use will find helpful suggestions in this publication.

* * * * * * * * * * * * * * * * * * *

Hardy Stocks for Baldwin Trees. It is a well known fact that we have no apple variety which completely replaces the "good old Baldwin". Cortland and Gallia are partial replacements, but there is real need for a combination eating and cooking apple to extend the McIntosh season. Many growers would probably take a chance on planting another Baldwin block, were it not for the susceptibility of this variety to winter injury. This is particularly true in view of the new red sport (Galbraith Baldwin) described in the November issue of Fruit Notes.

Why not develop a Baldwin orchard of this new strain on one of the hardy stocks, such as Virginia Crab or Hibernal? Baldwin trees on such stocks have been brought through severe winters at Orono, Maine. The chances in Massachusetts are very much better. To establish such an orchard a Virginia Crab tree, for example, which has been budded on a seedling root is set out in the orchard and allowed to develop a set of scaffold branches. These branches are later grafted or budded to Baldwin at points about a foot distant from the leader. Thus we get a Baldwin tree with a seedling root, and with a trunk and crotches of a very hardy variety. Any grower interested in starting such a block of trees may obtain the necessary information by contacting the compiler of Fruit Notes.

* * * * * * * * * * * * * * * * * * *

What is "Orchard Reorganization"? Many of our present day fruit plantings represent long years of "hit and miss evolution". Innumerable blocks of fruit trees have come into existence, not because the owner considered the soil and site ideal, but because particular areas were not well suited to anything else. "If it's too poor for hay, it will at least grow apple trees", seems to have been the philosophy behind some of the orchards of grandfather's day. And to make matters worse, small detached areas were often planted, thus contributing to inefficient management, while in some cases, extensions of particular blocks were accomplished by planting trees on areas which were either poorly drained or hopelessly rocky.

In its simplest terms, orchard reorganization means revamping our present day plantings to reduce the amount of labor required and to increase the per acre yield. Probably every orchard in Massachusetts lends itself in one way or another to this kind of improvement. Among the possibilities are (1) elimination of crowding fillers, old trees, blocks in frost pockets, etc., (2) drainage of wet spots, (3) removal of stone walls and boulders, (4) improvement of environment, (5) improvement in facilities for pollination, (6) consolidation of blocks and expansion by planting on better soils and sites, (7) smoothing of orchard floor to permit easier movement of equipment, (8) installation of better water supply for spraying, and (9) any other labor saving or yield increasing practice within reason Every acre at its best means every permanent tree at its best.

FIRE PROTECTION ON FRUIT FARMS

The recent destruction of several large Cold Storages by fire raises the question as to what can be done to prevent the repetition of such losses. In talking to Stacy Gay of Three Rivers recently, I discovered that he was very much interested in this question. In his own storage he has one small carbon tetrachloride fire extinguisher which holds perhaps two or three quarts of liquid. Such a small capacity extinguisher would probably be useful if one were right on the job when the fire started. But usually fires don't start at such opportune times.

Since an orchard sprayer is an excellent piece of fire fighting equipment, the question was raised as to how a sprayer could be fixed so that it could be used during freezing weather. Seldom is there heat enough in storage or outbuildings to prevent water from freezing. Therefore, the question is, what could be added to the water in a spray tank to prevent it from freezing so that it will always be ready for use when needed. The material must be non-inflammable, non-corrosive to the metal tank or pump, it must be cheap, if used around electrical equipment must be a non-conductor, and must be readily available. Also, what can be done to keep the engine and pump in condition for instant use? For example, how can the pipes in the pump be kept from drying out?

Until very recently our storage on the hill had nothing but the conventional acid and soda type extinguisher which would be very dangerous for the operator to use around any electrical equipment. I wonder how many fruit growers are aware of this danger and have provided themselves with types of fire extinguishers containing carbon tetrachloride or carbon dioxide to use around electrical equipment.

J. S. Bailey

* *

RAT CONTROL -- A YEAR ROUND JOB

Rats never take vacations. They may raise 6 or more litters per year with from 6 to 22 in a litter. Ignoring the death rate, the progeny from one pair of rats could exceed 350,000,000 in 3 years.

Hence rat control must be a continuous job. "Rat-control weeks" are entirely ineffective against the continuous activities of rats, unless they are followed by a year-round program of rat killing. Once rat numbers are reduced in a community they can be kept down at little cost by "maintenance control". If regular control is neglected during the year, rats will rapidly increase, until they require another intensive and expensive rat-control week. Costs are decreased and losses of grain are minimized when each farmer, miller, and householder makes rat control a part of his regular chores.

Pre-baiting is still one of the most important steps in rat poisoning. No one can tell you very accurately how many rats you are feeding on your farm or in your town. The chances are that you are host to many more rats than you think possible. The chances are also very good that in attempting to control your rats haphazardly, you have succeeded in training them to distrust you, to be wary of food. Nor do you know where these rats of yours are concentrated. You may be able to predict, more or less accurately, that most of them are around the chicken house or in the barn. What percentage of the total population? You do not know. Pre-baiting with unpoisoned food that is clean and fresh will tell you much about your rat population.

Take plenty of time to pre-bait, a week if necessary. As far as possible, remove all sources of food for rats before exposing baits. Cover grain bins, empty self-feeders, protect garbage, etc. Do not disturb the environment any more than necessary as this tends to make the rats suspicious.

The best bait for your farm can only be determined by trial. Some suggested baits are as follow:

Meats: Fresh hamburger, ground bacon, canned dog food, dried dog food.

Fish: Fresh ground fish, canned fish as salmon, tuna, sardines or cat food.

* *

MANAGING THE SMALL FOREST

(Since many fruit farms in Massachusetts include a farm woodlot, the following suggestions from an experienced forester will be of interest to fruit growers)

In this issue of Fruit Notes I wish to discuss the management, protection, estimating, cutting, and selling of the forest crop, taken from the farm woodlot. The farm woodlot is a small forest, but very important in the management of a well run farm. The farm woodlot provides many items needed on the farm. It is not possible to ignore this source of supply.

Let me describe a small forest and how it is possible for you to help it grow. The small forest should have trees suited to the soil, climate, and locality. If you watch this very important condition, you will have a good salable crop later on. Poor or surplus trees must be thinned out and taken out to give the good ones more room to develop. Such a forest should have no over-ripe trees, past their best growing years, nor should there be any diseased or damaged trees and no very branchy or badly shaped trees.

You will find the forest floor covered with needles, leaves, twigs, and small branches. This covering permits the soil to absorb large amounts of water needed by the trees and also prevents erosion. Beneath this litter is a moist fertile layer of humus covered with sub-soil. Over-grazing and fires should be controlled. Over-grazing will ruin what otherwise will become a well managed and well kept forest on the farm.

If the trees are all of the same age, the crowns almost touch to form a sort of ceiling of foliage, called a canopy. In a mixed aged stand, there is no continued canopy, but in either case crowns are healthy and usually make up about a third of the total height of the tree.

How can you help the forest grow? We all know that a forest grows by itself, but we also know that it will grow faster, and bring more profit if the owner helps it along. The owner wants to have as many trees as he can of the best quality possible in his forest, and he has these by good management and good management alone.

In your woodlot you will find trees that are crooked, trees that are forked, trees that are diseased, some that are dying, and others that stand too close together. These are the trees to concentrate on at the time of cutting, whether you are cutting for saw logs or for cordwood. Every time you do any cutting in the woods you should be making an improvement cutting. From these harvestings you will be able to get some firewood, possibly some pulpwood, and bean poles or

tobacco poles. You will also be able to get some rails for your fences and certainly you will be able to get some fence posts which are very badly needed on the farm. All of these materials taken from the farm forest represent clear gain.

Now in the farm forest we will find weed trees, such as red maple, pitch pine, choke cherry, and often times various other types of hardwood sprouts which choke out the better types of trees. All of these poor specimens should be cleaned out. If no use can be made of the unwanted small trees, a good way is to lop off only their tops. Then they will live on, shade the ground, and force the better ones to grow tall and straight. In order to save time my recommendation is to cut only those inferior trees which are actually choking off the better ones.

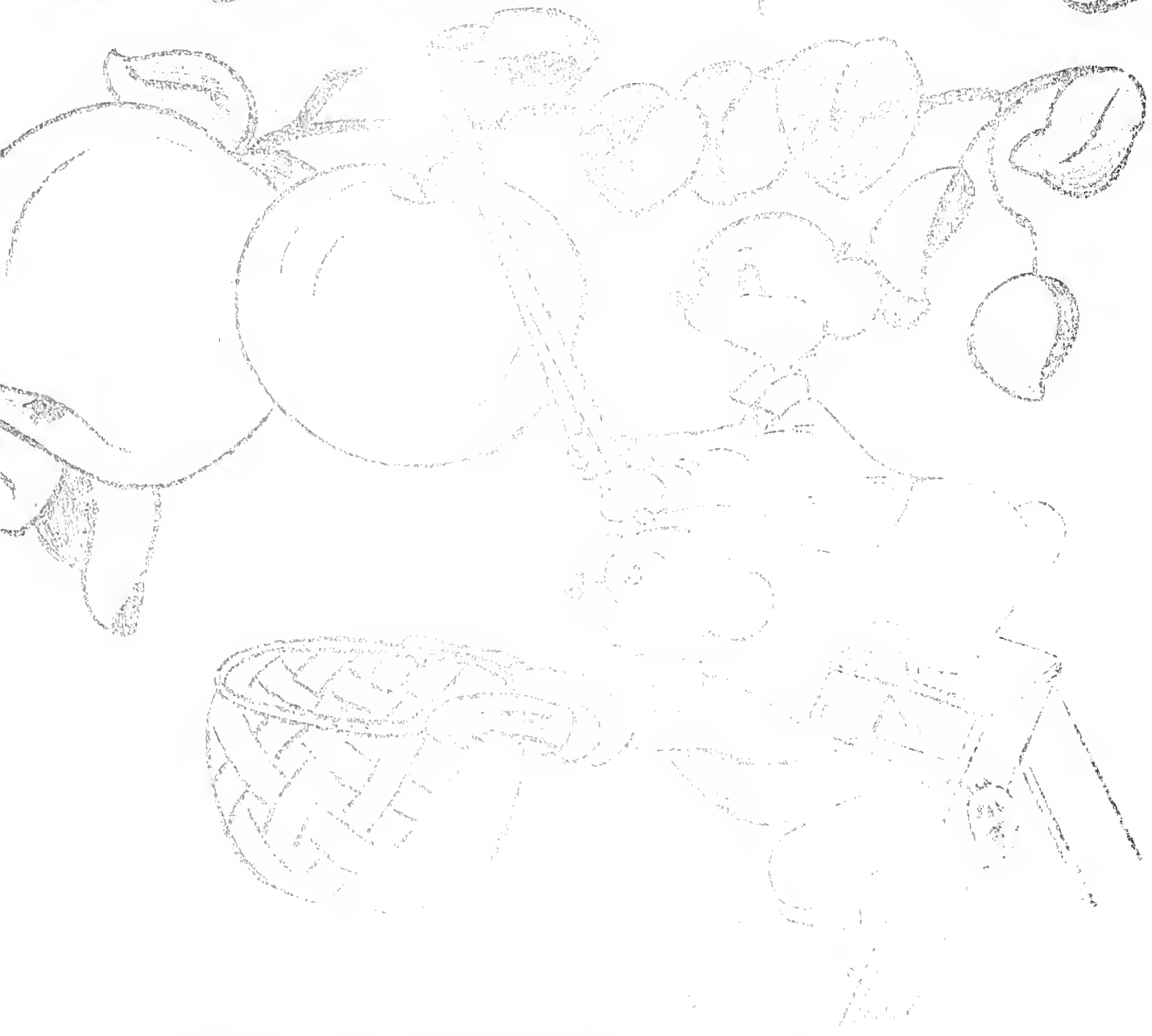
In the next issue I will discuss thinning and pruning for better quality lumber.

R. B. Parmenter

* *

INDEX - 1947 (The number following the month indicates the page on which the article appears)

Fruit Notes



Prepared by the Ext... Program Com...
W. M. Thies, Extension ...

Ogden, ...

February 28, 1948

Peach Buds and Low Temperatures
Evaluation of Fungicides
Shall the Apple Grading Law Be Changed?
'Western' Lead Arsenate
What Kind of Spray-Oil?
Managing Small Forests

Issued by the Extension Service ... July 1 and June 30, 1914, Willard F. Munson, Director. Printed by ... United States Department of Agriculture and County Extension Service Cooperating.

PEACH BUDS AND LOW TEMPERATURES

Peach buds in the University orchard survived a minimum temperature of -16.5° on January 24. A recent examination reveals that there is less than 1% injury to tender varieties such as Triogem and Golden east. In some seasons a minimum temperature of -16° would cause considerable injury to peach buds or might even destroy all of them. Such seasons are those which have periods of mild weather followed by a sudden drop to a low minimum. Fortunately for the peach growers, this winter has been one of long continued cold without any periods of mild weather. The maximum temperature barely went above freezing for a month previous to January 24 and there were seven or more nights when the temperature was below zero. This extended cold spell conditioned the peach buds so that they were able to withstand the low temperatures which occurred in our peach orchard. In orchards where the minimum temperature dropped lower than -16° there will no doubt be more injury than we observed, but it should take an extremely low temperature to kill every peach bud this year.

-- W. D. Weeks

****

New Strawberry Variety Released Fairland, a new, early, red-stele resistant strawberry which may be adapted to New England, has been released by the USDA and the Univ. of Maryland. Trials in the Northeast indicate Fairland as suited to the region where Howard 17 is an important variety. Selected in 1938 from crosses between Aberdeen and Fairfax at the Plant Industry Station at Beltsville, Maryland, Fairland has been widely tested as US-3205. Interested growers may buy Fairland plants from nurseries in Maryland and Delaware which cooperated in conducting the field trials.

Blueberry Pollination The importance of cross pollination of blueberry varieties is emphasized in experiments by E. M. Meader and G. M. Darrow covering a period of 3 years. Work with 15 highbush varieties show that cross pollination usually increased the crop sufficiently to warrant inter-planting of two or more varieties. It tended to increase the percentage of fully developed seeds per berry and resulted in larger berries. In 1945 the cross pollinated Rubel gave a 43% greater crop than the self pollinated, and the yield for the first 8 days of harvest was 3.6 times that of the self pollinated.

Raspberry Spur Blight Succumbs to Fermate A raspberry planting in the Connecticut Valley which was so badly infected by Spur Blight as to be practically worthless, has recovered completely under Fermate treatments and promises a bumper crop this season. Two Fermate applications on the new canes, plus a Delayed Dormant application of Elgetol where the infection is severe, will do the trick. For full details, get a copy of the mimeographed leaflet from your county extension office. Fermate is what might be termed a "specific fungicide" for the control of both Spur Blight and Anthracnose.

****

Safety is NO ACCIDENT

EVALUATION OF FUNGICIDES FOR APPLE DISEASE CONTROL

	Lime Sulfur	Wettable Sulfur (Dry)	Wettable Sulfur (Paste)	Fermate	Puratized	Phygon
Scab Protection	Excellent	Fair	Good	Good	Good	Excellent
Scab Eradication	Good	Poor	Poor	Fair*	Good	Fair
Cedar Rust Protection	Good	Fair	Fair	Excellent	Poor	Excellent
Effect on Foliage	Injurious	Safe	Safe	Safe	Safe	Injurious
Effect on Fruit	Caustic	Safe	Safe	Safe	Safe	Safe in early sprays
Effect on Pollen	Injurious	Safe	Safe	Injurious	Injurious	Injurious
Effect on Operator	Disagreeable	Safe	Safe	Safe	Safe	Use cautiously
Compatibility	Sometimes harmful (with Lead Arsenate) to Delicious and Baldwin fruit.			Do not use with Lime	Not to be used with Lime, clay and inert material.	Injurious if mixed with or followed by DN
Cost	Very low	Low	Very low	Moderate	Very high	Very high

*Inactivates scab spores. Does not kill scab unless combined with other fungicides like wettable sulfur, 1/2 formula, or Puratized, 1 pint.

-- E. F. Guba

Apple Purchase Program An announcement was received in the PMA office in Amherst, February 6, to the effect that the USDA will purchase fresh apples for the School Lunch Program and for welfare use. Purchase will be made on the basis of an offer and acceptance from growers, associations of growers, grower's agents and licensed dealers. There will be no set price. The purchase announcement, blanks on which to make the offer, and information on grades and varieties may be obtained through County ACP offices.

Summary of Fruit Plant Patents The total number of Plant Patents issued in the United States up to December 31, 1947 is 773. Of this number, fruit plant patents as follows are included: Peach, 47; Apple, 27; Strawberry, 11; Plum, 10; Cherry, 9; Nectarine, 8; Apricot, 8; Grape, 6; Pear, 6; Blackberry, 3; Raspberry, 3; Avocado, 10; Orange, 7; Pecan, 3; and 1 each of Grapefruit, Lemon, Lime, Pomegranate and Walnut. (Rose variety patents lead the list, with a total of 320.)

An Observation on Bumblebees A report from the Cranberry Station in East Wareham contains this interesting comment: "A very remarkable and possibly very instructive incident relative to bee abundance was observed. The winter flowage was removed from a bog of 2½ acres in East Carver on June 20. Bumblebee workers and males came to this bog in astonishing numbers. It was estimated that a third of a million of these bees were there much of the time. Watching them at work as they rose from the cranberry vines and went back to them, gave one the strange feeling that he was looking on a bumblebee sea. Honeybees seemed to be entirely absent." (If similar breeding grounds for bumblebees were to surround an orchard and if the trees bloomed as late as cranberries, pollination would be less of a problem).

National Advertising The apple industry's first cooperative national ad appears in the February 21st issue of a popular weekly magazine. It is a full page, four color affair, featuring leading varieties, including McIntosh, with combined health and general use appeal.

****

IS IT TIME FOR A CHANGE IN THE PRESENT APPLE GRADING LAW?

Last April the Massachusetts Agricultural Program Board recommended that the M.F.G.A. appoint a committee - "To develop a program of education in grading, packing, and handling apples." In accordance with this request, President Cheney appointed the following committee: H. F. Bartlett, P. H. Couhig, J. B. Farrar, O. C. Roberts, and W. H. Thies.

In studying the problem to which it had been assigned this Committee discovered a general disregard of the Grading Law and only a feeble attempt to enforce it. Under these conditions the Committee concluded that any attempt to develop an educational program to aid in the improvement of grading and handling practices would be futile. Therefore, the Committee proceeded to find out the attitude of growers with respect to the apple grading law by sending questionnaires to 112 producers representing all classes from those with small orchards to those with the largest orchards in the State. Sixty percent of these questionnaires were returned which is considered exceedingly high for this type of survey. The questions asked with the number and percent of replies to each question are shown on the accompanying chart.

In addition to answering the questions, many growers made additional comments. Here are a few which are typical:

"No law is any good unless it is adhered to. Flagrant violations should be prosecuted. I believe the chief trouble is at retail level. Some stores buy junk and then sell at a marked up price. Apples below a certain grade should be kept off the retail market. No farm product is kicked around as much as apples."

"The law requiring the top of the box to be a fair sample of the whole box should be enforced on shipped in apples as well as on Massachusetts packs."

"It is about time for another try at rigid enforcement."

"I feel that standard U. S. Grades would simplify the efforts of growers to pack within a grade and should help inspectors to enforce the grade." "Many apples sold in Boston marked Mass. Fancy Grade are below the standard for that grade. If apples are marked a certain grade they should live up to that grade." "It would be better for the apple business to pack U. S. No. 1 and U. S. Fancy and then enforce the law." "I am in favor of a grading law made to apply to retailers if it could be enforced which is doubtful under present conditions." "There should also be a compulsory tax of 2 cents a bushel for advertising."

The survey made by this Committee indicates that the majority of apple growers in Massachusetts: (1) Favor a revision of the present Mass. Apple Grading Law. (2) Believe that the so-called "Massachusetts Grades" should be eliminated. (3) Feel that the law should apply to retailers as well as growers. (4) Favor the compulsory marking of the grade on a closed package. (5) Do not favor the marking of the grade on an open package. (6) Want the law rigidly enforced.

Results of Questionnaire on Mass. Apple Grading Law (Dec.-1947)
(This questionnaire was sent to 112 growers. Replies were received from 67, or 60% of the total number.)

	Yes	No
(1) Should the present Mass. Apple Grading Law be revised?	41 (75%)	14 (25%)
(2) Should the so-called "Massachusetts Grades" be eliminated so that the law would include U.S. Grades only?	51 (80%)	13 (20%)
(3) Should the grading law apply to retailers as well as growers?	58 (92%)	5 (8%)
(4) Should the grading law be rigidly enforced?	61 (95%)	3 (5%)
(5) Should the marking of the grade on a closed package be compulsory?	52 (81%)	12 (19%)
6. Should the marking of the grade on an open package be compulsory?	14 (23%)	48 (77%)
Total bushels represented		744,200

-- O. C. Roberts

****

Fruit School for Agricultural Instructors A Fruit School in Amherst, primarily for agricultural instructors, is planned for April 20 and 21. These dates coincide with the spring vacation in many high schools. Such a School will replace, for this year, the one for fruit growers held in 1946 and 1947. The latter may be resumed in 1949.

"WESTERN" LEAD ARSENATE

The unprecedented change-over from lead arsenate to DDT for the control of codling moth in the Pacific Northwest apparently has created a surplus of lead arsenate in that area. At least some of it has been made available in the East at some advantage to the consumer. Questions have been raised concerning the safeness and effectiveness of this western lead under our eastern conditions. Here are the answers that we have been able to gather at this writing.

Letters to Professor Whitcomb and me from state, federal and commercial entomologists who have worked with the several forms of western lead arsenate have provided the material upon which this report is based.

Form: Western lead arsenate is produced in two forms. One, the so-called amorphous type, consists of irregular particles in a variety of shapes. These may or may not be ground to finer sizes but the result is a powdery material similar to the standard acid lead arsenate well known already here in the East. The second type, known as flat or crystaline (platelet) lead arsenate differs from the standard type in the shape of the particles. They are flattened, irregular discs, a characteristic which can be seen under a microscope or good hand lens.

Relative Merits: There is some indication, not supported by all investigators, that the flat lead arsenate adhered to the foliage and fruit better than does the standard, amorphous form. Apparently the discs come to lie like shingles and thus form a more complete covering. It is the opinion of those contacted that conditions here in the East should not materially change the effectiveness of the flat-type lead arsenate nor make it less effective than the standard type.

Safeness: The relative safeness of the western and eastern leads should not differ. Both are required by law to contain not more than 0.75 per cent soluble arsenic. In view of this, no one can foresee any reason for believing that western leads of either form should be any more injurious to trees in the East than the standard lead arsenates used in the past.

Combination with other materials: There is the possibility that the addition of oil-type stickers and some other materials might cause a flocculation in the spray tank which would decrease the value of the flat-type lead if it has any advantage. In Massachusetts, where pests are severe enough to require the addition of an oil-type sticker, it is probable that DDT will be added to the lead arsenate. Where this is done no sticker need be included.

-- Ellsworth H. Wheeler

- - - - - - - - - - - - -

WHAT KIND OF SPRAY-OIL?

As a fruit grower, do you take better care of the motor in your car or tractor than you do the trees which provide your income? How do you buy oil for your motors? Most of you probably have a good reliable and favorite brand. You also know what viscosity or S.A.E. number is best for the particular engine. And, when asked whether you want a 30 or 35 cent oil, you always say "The best, of course".

How about spray-oils for your trees? Here again, specifications vary and so do prices. But do you know what characteristics in a spray-oil are desirable? Do you always choose the higher priced ones? These points can be important to you as a fruit grower. Spray-oils are not all alike. They differ in their effectiveness and in their safeness on your trees.

Let's settle, right away, one obvious difference between the oil products offered on the market. Some spray-oil stocks are prepared as oil emulsions. They look like a white paste and are truly a concentrated oil emulsion. Most contain about 83 per cent actual oil. The remainder is water and the emulsifier which was used to form the emulsion. Since they do contain water, these pastes must not be subjected to freezing.

Other spray-oils may be purchased in the form of an emulsible or miscible oil. These preparations are not emulsions but contain from 95 to 99 per cent actual oil plus some kind of an emulsifier. They look like plain oil but when poured into a tank of water a creamy-white emulsion is formed. Since there is no water present in the prepared product and no emulsion is preformed, freezing or standing around does not injure this type of spray-oil preparation.

Thus we see that either of the above stock preparations of oils is satisfactory so long as we know about the actual amount of oil present and the proper way to handle and dilute each type in the spray-tank. Of course, it is true that part of the price of an oil emulsion, the white paste type, is for the water it contains. Railroads do not haul water for nothing!

Then what is important in considering the purchase of an oil for spraying? Just this! The source or kind of "raw" oil that was used by the manufacturer in making up the concentrated oil emulsion or the emulsible (miscible) oil preparations which you buy. From here on, when I say "oil", I have reference to the raw oil as the manufacturer of the prepared products receives it from the producer or the refinery. These oils differ.

Studies by Dr. P. J. Chapman and his associates in Geneva, N. Y., as well as others in both state and commercial laboratories have shown that oils, particularly those from the eastern and mid-continent fields, are more highly paraffinic in character. These paraffinic oils are also more effective as insecticides. Oils from the western fields are classed as naphthenic and have been found to be less toxic to insect forms. Why then, should a fruit grower buy an oil emulsion or miscible spray-oil containing the less effective or naphthenic type of oil?

In these same studies the investigators have found that oil type and degree of refinement are important in determining the safeness of an oil on developing buds and young foliage. Why should you, as a fruit grower, use an oil that is less safe on your trees any more than you would use a poorer type of oil in your engine?

How can you tell whether the prepared spray-oil you are about to buy is made out of the better type of oil? Here are some suggestions.

Patronize a reliable dealer who represents or handles the products of a reputable manufacturer of insecticides. The table below gives the possible range in the specifications of a satisfactory raw oil of a safe, paraffinic type. With these specifications in hand a reliable and interested dealer can find out for you whether the prepared-oil stocks he handles contain oils which "fill the bill". Producers of raw oils and the manufacturers of prepared oil emulsions and miscible oils are well acquainted with these specifications and can provide the information for dealers.

The specifications follow on the next page. Don't worry if you or your dealer or his salesmen do not understand them; those who prepared the products will, or should understand if they know their business.

Specifications of paraffinic-type "raw" oils preferred for manufacturing oil emulsions and miscible oils for use on fruit trees in Green-Tip to Delayed-Dormant.

	Good Quality, Low Cost, Safe	Better Quality Higher Cost, Safer
Viscosity (Saybolt, at 100°F.)	----------90 -- 120 seconds -------	
Gravity (A.P.I. degrees)	28 (minimum)	31 (minimum)
Unsulfonated residue (A.S.T.M.)	75 "	90 "
Homogeneity	A relatively narrow boiling distillate portion of petroleum.	

* The following methods of testing oils are to be used: Viscosity: Kinematic, A.S.T.M. Designation: D445-39T. Conversion to Saybolt Universal Viscosity, A.S.T.M. Designation: D446-39. A.P.I. Gravity: A.S.T.M. Designation: D287-39. Unsulfonated Residue: A.S.T.M. Designation: D483-40.

-- Ellsworth H. Wheeler

****

MANAGING SMALL FORESTS

(This article is included in FRUIT NOTES not because some orchards resemble a forest, but because forest trees are included in many of our fruit farms.)

Harvesting the timber crop is a very important part of a management program. Harvest cuttings are made principally to obtain cash from the mature trees rather than improve the remaining trees. The manner in which this operation is performed decides whether the forest will be completely destroyed or left in shape to produce another crop in 5 or 10 years. There are several methods of harvesting the crop, namely clear cutting, leaving seed trees, cutting to a diameter limit, and last, selective cutting or selective logging.

There are some points in favor of the first three methods mentioned, but the best method is selective logging, or selective cutting. It is the best way to harvest a small forest of mixed age. In the small forest the farmer looks over each tree to decide whether he should cut it now or allow it to grow. This method combines both stand improvement and harvest cutting. In this selective cutting, there are such trees as those that are diseased or insect infested, the limby, crooked, or scarred trees, the old ones and less desirable varieties are cut which benefit the remainder. The other trees that are cut are those that have passed the best growing period or can be sold more profitably now than in the future. And so it is recommended that trees of low quality or over mature be cut for sale right now. Another advantage of selective logging is that each tree can be harvested at its highest value.

Too often trees are cut just when they are making their most rapid growth. Sometimes this may be justified by high market prices or by the owner's need for cash. Frequently however, he takes a real loss by cutting too soon. It is possible for the owner to find out exactly how fast trees are growing by using the following formula: $P = \frac{400}{ND}$ P = Percentage of growth in last year

N = Number of rings in the last inch D = Diameter of tree

Using this formula, the owner will find that a tree may be growing as much as 6% a year. Now that's good growth, allow the tree to remain, cut out some of the trees around it, and increase its growth.

The owner should go through his forest with a paint gun or paint brush and mark trees that ought to be felled. Using white or yellow paint, which is a contrasting color, these trees will stand out and the choppers will know exactly which ones to take out so as to leave your stand in fine condition. The trees should be marked twice, once about 4-1/2 feet from the ground and the other just below the stump height. This is being done so that you can check on the chopping. If any trees are not marked on the stump, they have been cut without the permission of the owner. Unless the stump is marked, the owner has no way of checking on the chopper.

Assistance in marking the stands for selective logging is available through the Extension Service and also to some extent through the Soil Conservation Service District. It is highly recommended that this service be requested in order that a small forest be properly marked for selective logging.

-- R. B. Parmenter

****

1948 Apple and Peach Spray and Dust Charts The 1948 recommendations for the control of Apple and Peach pests are now available at the county extension offices or at the University in Amherst. The new charts have been duplicated on recently acquired equipment in the Mailing Room. This makes it possible to distribute them about six weeks earlier than in 1947. If yourcopy is not delivered soon, we suggest that you contact your county extension office.

Apple Storage Capacity Exceeds 2,000,000 Bushels A recent survey of Massachusetts storages brings to light these interesting facts: "Country Point" storages total 92, are operated by 81 owners and have a combined capacity amounting to 1,807,000 bushels. "City" storages hold an added 360,000 bushels, making a total of 2,167,000 bushels. About 15 more storages are at this time in some stage of development, discussion, decision, planning or construction with an expected future capacity of perhaps a quarter of a million bushels. The number and total capacity of storages in the various counties are as follows: Berkshire (3) 31,000; Bristol (2) 15,000; Essex (7) 80,500; Franklin (5) 88,000; Hampden (13) 93,000; Hampshire (5) 75,500; Middlesex (36) 1,038,000; Norfolk (6) 48,500; Worcester (15) 271,500.

A Winning Combination The Red Apple Club combines 3 important factors in the fruit business -- pest control, fruit color and yield. If each of these are good, production costs are lowered and profits are raised. We once saw a vaudeville actor who performed the seemingly impossible feat of hanging a plug hat on his toe, placing a lighted cigar and a small bouquet on the hat, kicking the assortment into the air and (believe it or not) catching the hat on his head, the bouquet on his coat lapel and the cigar in his mouth. And he got paid for it! The apple grower, likewise, gets paid for a 3-in-1 performance -- mastery of insects and diseases, brilliant fruit color and a bumper yield.

No January FRUIT NOTES This is the first issue of FRUIT NOTES since December. None was issued in January for a variety of reasons.

Fruit Notes

APRIL 30, 1948

Prepared by the Fruit Program Committee of the Extension Service
W. H. Thies, Extension Horticulturist

Contents

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

LIMING ORCHARD SOILS

To offset the acidifying effect of repeated applications of sulfur in an orchard, about 3 pounds of high magnesium lime are needed for each pound of sulfur applied as sulfur dust or wettable sulfur spray. In other words, an orchard receiving 500 pounds of sulfur per acre per year will need about 1½ tons of lime every other year just to neutralize the sulfur. No wonder many of our orchard soils are extremely acid.

How does a fruit grower go about getting the high magnesium lime needed for his orchard? We put this question up to L. C. Kimball, Worcester County Assistant in Conservation. Here are his comments: "First contact your local community committeeman or the County Agricultural Conservation office. A farmer requests as much lime as he thinks he needs. The community committee then considers the request. It may recommend more or less than the farmer, although the county committee usually approves the smaller of these two amounts. Bulk spreading is the common practice in larger orchards, the lime coming to the farm in trucks. Smaller orchards still get delivery in bags. At least three lime concerns have a product testing 21% magnesium oxide (MgO). One of these concerns (Lee) also has a product from another quarry testing 7%. Others deal in high calcium lime, some testing as low in MgO as .5%".

There is seldom enough of the 21% product to supply the demand among fruit growers. But every fruit grower should specify this high magnesium type of lime. No cheaper form of magnesium, to prevent a deficiency in future years is available. By all means get a 21% MgO lime if you can, and in no case apply a lime with less than 7% MgO. Conservation workers will be very cooperative in conforming so far as possible to the needs of the fruit grower. Tell him what you want. As in some other fields, it may be a case of "the wheel that does the squeaking gets the grease". The 3 to 1 ratio between lime and sulfur is well worth remembering.

* *

THE MAGNESIUM DEFICIENCY SITUATION

(We quote here part of a letter on this subject written by W. G. Colby of the Agronomy Department)

"Many if not most of the soils of our state are potentially deficient in magnesium. The easiest and cheapest way to supply magnesium, unless serious symptoms of deficiency are present, is to use magnesium limestone. Since many of the orchard soils need lime, the use of dolomitic limestone serves a double purpose, viz., correcting a soil acidity and supplying the nutrients magnesium and calcium. The use of high calcium lime might even accentuate the need for magnesium.

In the mineral nutrition of plants, the plant tends to take in a fairly constant quantity of bases, calcium, magnesium, potassium and sodium. If the available supply of any one of these elements greatly overbalances the supply of any of the other three, deficiency symptoms of any one of these three may develop. In other words, an over-supply of calcium makes it more difficult for the plant to obtain both magnesium and potassium and an over-supply of potassium in turn makes it more difficult for the plant to obtain magnesium and calcium, etc. This helps to explain, for example, why plots treated with potash frequently develop magnesium deficiency symptoms whereas plots receiving no potash show no magnesium deficiency.

It seems to me that the A.C.P. has something very worthwhile to offer to the orchardists of Massachusetts and that if the conservation program can give magnesium limestone rather than high calcium limestone, they will be accomplishing two objectives, viz., neutralizing excess soil acidity and supplying the nutrients, calcium and magnesium."

Effect of Mulch on Yield of Northern Spy Apples The following data showing the effect of a liberal mulch in a Michigan orchard is furnished by E. J. Rasmussen, now of New Hampshire . The year the trees were mulched, each tree received 500 pounds. No mulch or fertilizers were applied later except on the check trees which had the regular fertilizer treatment. It will be noted that the effect of one application of mulch in 1942 began to wear off after about 5 years when compared to unmulched trees.

Year	Unmulched	Mulched, 1942	Mulched, 1945
1942	9.5 bu.	17.0 bu.	-----
1943	8.5 bu.	20.8 bu.	7.5 bu.
1944	17.0 bu.	20.7 bu.	17.7 bu.
1945	5.5 bu.	9.2 bu.	5.8 bu.
1946	20.1 bu.	24.4 bu.	31.5 bu.
1947	19.4 bu.	21.2 bu.	27.1 bu.

* ** *

FARM AND HOME WEEK FRUIT MEETING

University of Massachusetts, Amherst - July 21

* *

How Many Trees Do You Spray Per Minute? Knowing the output of our spray pump and the number of trees passed per minute we can easily figure the number of gallons applied on each tree. Following are the numbers of trees passed per minute while driving at varying speeds in orchards with trees spaced at different distances:

Miles per Hour	Tree Spacings (feet)				
	16x16	20x20	25x25	30x30	40x40
1.0	5.5	4.4	3.5	2.9	2.2
1.5	8.2	6.6	5.3	4.7	3.3
2.0	11.0	8.8	7.0	5.8	4.4
3.0	16.5	13.2	10.5	8.7	6.6
4.0	22.0	17.6	14.0	11.6	8.8

* *

Lime Sulfur Tends to Reduce Yields Most apple growers are familiar with what is commonly known as lime sulfur burn, both on the skin of the operator and on the leaves of the tree. Leaves treated with this caustic material are smaller. They have scorched margins and are less efficient in the manufacture of starch. That is why the milder forms of sulfur are used so generally today with a resultant increase in yields. Following are some figures from a Virginia orchard where part of the trees were sprayed with lime sulfur over a period of 5 years, and the rest with flotation sulfur. Four crops were borne during the 5 years. The trees sprayed with lime sulfur averaged 4.06 bushels per tree while those sprayed with flotation averaged 5.85 bushels per year.

* *

No March Fruit Notes Lest some readers of FRUIT NOTES wonder if they have been dropped from our mailing list, we offer this explanation. No issue was distributed during the month of March.

PROVIDE WATER FOR BEES DURING POLLINATION

The need of water by bees is not commonly understood. In the case of colonies brought into the orchard for pollination, the provision of a good source of uncontaminated water close to the bees will benefit them in two ways; in the first place they will not have to seek for a supply of water, possibly at some distance, and this will permit more time for working the blossoms; in the second place if they can have a source of uncontaminated water there will be much less chance of bee poisoning. Frequently, bees having no other source of water will collect dew from leaves having a deposit of poison from early spraying. Another source of danger is from the bees collecting water near the filling station where insecticides or fungicides may have been inadvertently spilled. One of the best sources of water is from a keg from which water drips slowly on an inclined board. Pans of water also can be used but it will be necessary to place shavings or similar materials in the water in order to allow the bees to have a chance to light. Moreover, with the open pans there is the possibility of the spread of Nosema disease to bees since open pans may be contaminated by body wastes as the bee is drinking.

If a brook is present within $\frac{1}{4}$ mile, little concern need be given to the provision of a water supply unless such a source of water is contaminated by insecticides or fungicides.

-- F. R. Shaw

* *

RECENT REPORTS ON CONTROL OF FRUIT DISEASES

The following are brief references to progress reports given at the annual meeting of the American Phytopathological Society in Chicago, December 28-30, 1947. The complete printed abstracts of each may be found on the pages indicated of the January 1948 issue of PHYTOPATHOLOGY.

1. Antibiotics for plant disease control: Curt Leben and G. W. Keitt, Wisc. Station (p. 16). In laboratory tests a species of Streptomyces produced a substance that was highly antagonistic to 29 different plant disease fungi. It completely inhibited growth of the apple scab fungus at a dilution of 1:8,000,000 and of the peach brown rot fungus at 1:11,000,000. When sprayed once on susceptible apple leaves 4 days prior to inoculation in the greenhouse, the antibiotic material either prevented outright or greatly reduced scab infection. The substance was not toxic to most bacteria.

2. In a second greenhouse test using the streptomycin, the same workers (p. 16) obtained complete prevention of apple leaf infection by scab, and tomato leaf infection by early blight. Artificial rain tests indicated that the active material resisted washing on both kinds of plants.

3. Antibiotics for crown gall control; Jack E. Hampton, Arizona Station (p. 11). Active galls on plum, pear, cherry and privet, as well as on various herbaceous plants, were quickly and completely inactivated by thoroughly soaking with penicillin and streptomycin. Commercial preparations and locally produced crude preparations were equally effective. Streptomycin was found to be somewhat more efficient than penicillin.

4. At the same (Arizona) Station, J. G. Brown found (p. 3) in similar tests that those antibiotic materials acted only upon the diseased tissues, killing the gall cells and causing the galls to disintegrate, but having no effect upon the healthy host tissue (root, stem, branch) from which the galls had developed.

5. Fermate concentrate spray from airplane for apple rust control; A. B. Groves, W. Va. Station (p. 11). A single application May 11 on York and Winesap trees, using 7.5 oz. of Fermate per gallon of water, at the rate of 8 gallons per acre, gave a reduction in cedar rust spots of over 94%.

6. Sour cherry susceptible to the peach X-Disease; D. H. Palmiter and K. G. Parker, New York Station (p. 20). English Morello and Montmorency cherries growing near X-diseased chokecherries and peach trees showed virus-like symptoms. Graft and bud inoculations into peach trees from diseased cherry trees produced typical X-disease symptoms in the peach trees. Corresponding symptoms were produced on sour cherry trees by inserting buds from X-diseased chokecherries. As a result of this disease, 55% of the trees in one English Morello orchard produced no fruit in 1947.

7. Apple bitter rot reported on fruits of sour cherry; Clyde E. Peet and Carlton F. Taylor, W. Va. Station (p. 20). Dry sunken rot was produced on one side of the fruit with typical pinkish spore masses, with up to 15% of the fruits affected in some trees. Successful inoculations of apple fruits proved the correct identity of the fungus.

8. Apple bitter rot on peaches; G. B. Ramsey, M. A. Smith, and B. C. Heiberg, U.S.D.A. (p. 22). Certain shipments of peaches in northern markets from Georgia during July 1947 showed brown, dryish lesions from one-fourth to three-fourths inches in diameter with typical bitter rot pinkish spore pustules. Inoculations produced typical bitter rot on apples and pears, also similar lesions on peach and plum fruits.

-- O. C. Boyd

* *

50th Anniversary of the Cortland Apple The original cross between McIntosh and Ben Davis which resulted in the Cortland variety is said to have been made in 1898, just 50 years ago, and the first tree bore its first apple around 1906. It was introduced about 1915. The intervening years have seen thousands of tests of this variety. It has been tried under all sorts of conditions as regards soil types, spray programs and storages. We believe it has stood the test fairly well and is today well established as one of our fairly important varieties. Certainly its reputation has improved during the past 10 years. Possibly the old saying, "It takes 50 years for an apple variety to prove its worthwhileness" is partially true.

* *

Coverage Possibilities of a Fine Mist Spray The numbers of droplets per square inch resulting from the distribution of a gallon of liquid uniformly over a surface of one acre are indicated by the following data. (A micron is about 1/25000 of an inch and 1000 microns are equal to about 1/25 of an inch):

Diam. of Droplets in microns	Number of Droplets per Square Inch
50	9224
100	1164
200	142
500	9
1000	1.1

In still air, droplets 50 microns in diameter require about 3.4 minutes to fall 50 feet, while those with a diameter of 5 microns require about 5.5 hours to fall the same distance.

* *

A Sling Psychrometer in Every Storage To eliminate guesswork concerning the relative humidity in an apple storage every storage owner should own and use a sling psychrometer, more commonly known as a wet and dry bulb thermometer. The cost amounts to about 4 or 5 dollars. Proper relative humidity and proper temperature go hand in hand in the maintenance of top quality. Premature ripening as well as shrivelling are prevented by keeping both of these factors as nearly ideal as possible. Experiments show that an apple loses more water at 50° and relative humidity 80%, than it does at 30° and relative humidity 70%.

* *

A New Bulletin, "Apples as Food" This new publication, Bulletin No. 440, by Esselen, Fellers and Gutowska, is now available from the Mailing Room at the University or from your County Extension office. It covers the following topics: History of the apple, production and consumption, composition of apples, factors affecting composition, effect of processing and cooking on composition and nutritive value, and physiological and therapeutic properties of apples. It also contains a very complete bibliography.

* *

Menacing Mummies Peach mummies are the result of decayed peaches from previous years and yet they are themselves extremely resistant to further decay. Their role in the spread of Brown Rot is a dual affair. Not only do the partially buried mummies on the ground give rise to spores which develop in large numbers in the toadstool-like growths, but the dried mummies on the tree may themselves take on a grayish appearance and produce so-called conidiospores. These mummies are a menace whether on the tree or on the ground. Light cultivation during the spring season tends to break off the fruiting bodies from the mummies on the ground and thus prevent the maturity of spores. It is not very commonly known that a mummy may lie dormant for 3 to 5 years only to function as a spore producer when conditions become favorable as for example, when the mummy becomes covered by a thin layer of moist soil. Brown rot control is greatly simplified if all of the mummies are destroyed or treated in such way as to prevent spore development.

* *

CHEMICAL THINNING OF APPLES

Dinitro Materials Apple thinning presents some problems. Varieties vary widely in their tendency to set heavily, bear regularly, and in their pollination requirements. The amount of bloom, time of bloom, vigor and age of trees, pollinating weather, type of pollenizers in the block, bee activity, soil, and nutritional conditions of the tree must be considered. The dinitro materials, Elgetol and the powder DN No. 1, are the most suitable dinitro materials. They must be used at blossom time. With the varieties Yellow Transparent, Duchess, Wealthy, Baldwin, and Golden Delicious, these materials should be applied the first day of full bloom of the spurs. Some varieties, particularly Wealthy and occasionally Baldwin, may have a large number of flower buds laterally and terminally on the past season's shoots which generally open two or three days later than the spur bloom. On such varieties, a second application at half strength is often necessary. For varieties like Delicious, Northern Spy and R. I. Greening, the dinitros should be applied the second day of full bloom. These varieties apparently need more time for cross pollination to take place. These three varieties, when vigorous, fully grown, and adequately cross pollenized, may need thinning to obtain suitable fruit size and overcome their tendency to alternate. Of the dinitro materials, DN No. 1 is beginning to gain favor over the liquid DN's and the powder DN No. 2, since it appears to thin as well as the other dinitros but is less caustic and injurious to the foliage.

Following is a suggested concentration schedule when using the dinitro materials.

Variety	Time of Application	Dinitro Per 100 Gals. Liquid	Powder
Duchess	1st day full bloom	1 1/2 to 2 pts.	3/4 to 1 lb.
Yellow Transparent	1st day full bloom	1 1/2 to 2 pts.	3/4 to 1 lb.
Wealthy	1st day full bloom	2 pts.	1 lb.
	(Possible 2nd application for lateral & terminal bloom)	1 pt.	1/2 lb.
Baldwin	1st day full bloom	1 1/2 to 2 pts.	1 lb.
Golden Delicious	1st day full bloom	1 pt.	1/2 lb.
Delicious	2nd day full bloom	1 pt.	1/2 lb.

Hormones During the last two years considerable interest has been shown in chemical thinning with naphthalene-acetic acid and some of its derivatives. It has been used successfully on Delicious, Baldwin, Wealthy, and Northern Spy applied at calyx time. The commercial preparation about which most is known is "App-L-Set" and the concentrations suggested are based on experiments with it alone. Other commercial formulations may or may not thin to the same extent. This type of material has the advantage over the dinitro materials in that accurate timing of the spray is not as important. Also, it may be applied after the blossom period when there is less chance of frost and the maximum amount of pollination and fertilization has taken place. This period of delay can be important and helpful in deciding whether to do any chemical thinning in early blooming seasons or when weather conditions have not been ideal for pollination and fertilization up to the time of full bloom.

However, the hormone materials may be somewhat erratic in performance and cause occasional twisting of the leaves. Also, it is not yet known whether trees of such alternate bearing varieties as Wealthy will bear annual crops following its use. In other words, we have less experimental evidence with this material than we have with the dinitros.

The suggested concentrations of App-L-Set for thinning at calyx time for vigorous mature trees are:

Varieties	Ounces of App-L-Set at Calyx Time per 100 gals.
Delicious	4
Northern Spy	4
Wealthy	8
Baldwin	8

We would expect, but have no evidence to prove, that Early McIntosh, Duchess and Yellow Transparent will require from 6 to 8 ounces of App-L-Set at Calyx time.

-- F. W. Southwick

* * * * * * * * * * * * * * * * * * * *

YOU CAN SAVE ON SPRAY OILS IN 1949

Why not use a safer, more effective oil spray and save on spraying costs at the same time? It can be done -- one 1947 Red Apple Club member is doing it every year.

On the farm of Mr. Shaun Kelley, in Richmond, Berkshire County, orchard manager Edward Coningsby proves that savings are possible. How? He does not purchase a concentrated oil emulsion (which usually contains at least 14% water and is difficult to hold over from one season to the next) nor a miscible oil (which is often less effective because so much material is likely to run off the tree and may be expensive too) nor an emulsible oil (which has many advantages,but, like the other two, unless you are sure, may not contain the safer and more effective types of oil and also may be expensive).

Instead, for the Kelley farm orchards, a highly-paraffinic, straight oil is purchased -- a 100% oil having specifications equal to those listed in the February 28 FRUIT NOTES for the "Better Quality, Higher Cost, Safer" type of paraffinic oil. Let's call it a high gravity (at least 31), high unsulfonated residue (at least 90) or "superior" oil.

How much did it cost? This superior oil actually cost the grower less per gallon than would a concentrated oil emulsion (with the water in it), a miscible oil or an emulsible oil. And, furthermore, since it is a superior oil and thus more effective, the grower uses it at a lower concentration of only 2 gallons of actual oil per 100.

Still another saving is possible. Mr. Coningsby emulsifies this superior oil in the tank of his spray-rig. He uses Bordeaux mixture (2 lbs. copper sulphate, 4 lbs. lime) as the emulsifier. And there is the point. By using a superior -- a safe oil -- the oil application can be continued into the late delayed-dormant, when 2 to 3 spur leaves are curled back from the cluster bud. In many years a fungicide is necessary at this time. The Bordeaux mixture not only emulsifies the oil but also acts as the fungicide. It would appear to me that this combination might save, in some years at least, separate applications of an oil in the green tip or early delayed-dormant followed by a fungicide in the late delayed-dormant or early pre-pink.

Some growers prefer not to use copper because of the possibility of russetting under some conditions. That need not prevent them from taking advantage of the savings described above. A commercial blood albumin containing 4 ounces of actual blood albumin and 12 ounces of inert clay per pound makes an excellent, thoroughly tested and inexpensive emulsifier for tank-mixing oil sprays. Fermate or a similar

material may be used as the fungicide. In fact, blood albumin (2 ounces actual blood albumin or 1/2 pound commercial material per 100) is recommended for use along with the Bordeaux mixture in New York where some 75-80% of the apple growers tank-mixed superior oils in 1948 for delayed-dormant and late delayed-dormant applications.

If they know you are interested soon enough, I am certain that your dealers will cooperate 100% in making sure that they can supply you with commercial blood albumin and with straight, paraffinic-base oils having the recommended specifications and at prices allowing for real savings. Some 6 or 8 oil producers and refiners had regular and superior paraffinic-base oils available in 1948. Prepared miscible and emulsible oil products made from superior oils are available if you desire them.

You may have been told tank-mixing requires extra time and is inconvenient. Here are some facts.

Tank-mixed oil emulsions may be prepared in any conventional type of spray rig now in use in Massachusetts orchards including the speed sprayer. Besides adding the emulsifier, just three operations are involved which are not necessary with prepared miscible oils and some oil emulsions but which would improve and safen the use of oil sprays if practiced where most oil emulsions and all emulsible oils are employed. They are: (1) shutting off the water after from 10-15 gallons -- never more -- are in the tank (2) pumping the mixture of water, emulsifier and straight oil through the pump and back into itself, preferably through a gun or broom for at least one minute -- (1½ to 2 minutes if you guess at it) -- this makes a good time to fill and light the pipe (3) turning on the water again to fill up the tank. In other words 2 minutes is all the extra time that need be required to prepare a load of tank-mixed oil emulsion.

Complete directions for, and demonstrations of, tank-mixing oils will be available in 1949 through your County Extension Service. Complete specifications for the regular type (minimum values of 28 gravity and 75 unsulfonated residue) and superior type paraffinic-base oils as drawn up by Doctors P. J. Chapman and G. W. Pierce of Cornell University will be available early in the fall.

-- Ellsworth H. Wheeler

* *

THE ABC's OF FIRE PREVENTION

In a recent farm survey 81% of the farmers were found to be tolerating dangerous fire hazards which could be easily remedied, according to W. C. Harrington, farm safety engineer. Fire prevention and fire protection begin with fundamentals, but many farmers do not realize that there are three basic types of fires and that each should be handled in a different way.

Class A fires involve wood, trash, paper and other combustibles and can be fought effectively with soda-acid extinguishers. Class B fires are grease, oil, and gasoline fires and should be smothered with carbon dioxide, foam or vaporizing liquid extinguishers. Class C fires are electrical fires and should be controlled with carbon dioxide, or vaporizing liquid extinguishers. If possible, the current should be shut off. In all cases, extinguishers approved by the Underwriters' Laboratories should be used. Failure to appreciate the ABC fundamentals of fire costs farmers an estimated $90,000,000 worth of property and kills approximately 3,500 people on farms each year.

HOW FRESH FRUITS RATE IN FOOD VALUE

(From a chart supplied by the Bureau of Human Nutrition and Home Economics)

	Per 100 grams or raw food, edible portion						
				B Vitamins			
	Approximate measure equivalent to 100 grams of food [1]	Vitamin A value	Vitamin C	Thiamine	Riboflavin	Iron	Calories
Apples	1 small	.	*				65
Apricots	3	***					55
Avocados	½, 4" diameter		*				265
Bananas	1 medium		*				100
Blackberries (or dewberries)	3/4 cup		**		(2)		60
Blueberries (or huckleberries)	3/4 cup		*				70
Cantaloups (or muskmelons)	¼ melon, 5" diam.	**	**				25
Cherries	3/4 cup		*				70
Cranberries	1 cup		*		(2)		55
Currants (fresh)	3/4 cup		**		(2)		60
Dates	12-15					*	315
Figs (fresh)	2-3 large						90
Gooseberries	3/4 cup		**	(2)	(2)		45
Grapefruit	1/2 medium		***				45
Grapes	1 bunch of 20-25 grapes						75
Guavas	½ cup or 1 large		***			*	80
Lemons	½ cup juice		***				45
Limes	½ cup juice		**				55
Mangoes	½ cup or 1 medium	**	**				75
Oranges	1 medium		***				50
Papayas	1 wedge 3"	**	***				45
Peaches	1 medium	*	*				50
Pears	1 medium						70
Persimmons (Japanese)	1 medium	**	***		(2)		85
Pineapple	1 slice 3/4" thick		**				60
Plums	2-3 medium			*			55
Raspberries	3/4 cup		**		(2)		75
Rhubarb	1 cup diced		*				20
Strawberries	3/4 cup		***				40
Tangerines	2 small		**				50
Watermelons	1 slice, 2½" x 2½" x 1"	*					30

*** Excellent; ** Good; * Fair; less than fair (no entry)

RATINGS: Excellent, good, fair, as used in this table are based on the dietary allowances of nutrients for a moderately active man, recommended by the National Research Council in August 1945. To rate Excellent, a raw food provides at least 50 percent of the daily allowance for each nutrient; Good, 25 percent; Fair 10 percent. Ratings do not take into account losses of vitamins or minerals that may occur during cooking, cutting, or other preparation.

1 Approximate measures are compiled from various sources.

2 Data are insufficient to rate the food as a source of this nutrient.

MANAGING THE SMALL FOREST

At this time of year a question arises, "Should I plant forest trees?" This can be answered in a general way but it is always better to have advice from the Extension Forester, County Agent, or the Soil Conservation Technician. Trees of useful varieties and successfully started on the right land are almost sure to return a profit to their owner. The planted forest also yields many products needed on the farm, such as posts, firewood, lumber, and timbers. It is also a home for wildlife, may serve as a windbreak, will conserve moisture and prevent erosion, also it will give the owner and his family recreation.

Generally, forest trees should be planted: (1) on cut over areas or in forests so run down that they are not reseeding or are reseeding too slowly; (2) on land that will be or has been ruined by sheet or gully erosion; (3) on rocky, hilly or worn out land; (4) on land restocking to worthless kinds of trees; (5) on odd corners of woodland too small or inaccessible for cultivated crops or pasture.

Another question that always comes up, "What kind of trees should I plant?" Roughly speaking, we have light sandy, gravelly soil on which red or Norway pine is the best tree to plant. We have sandy loam, a little heavier soil and sill-light, on which white pine grows to best advantage. And then we have a type of soil with a clay base so that drainage is poor, and we recommend spruce as the best tree to plant on this type of soil.

For complete information on forest planting in Massachusetts, send to the Extension Service at the University of Massachusetts for leaflet No. 213. In this bulletin soil and the tree have been tied together.

-- R. B. Parmenter

* *

Pruning Deer Damaged Trees In an area where young trees are subject to deer damage, it is not advisable to practice the same type of pruning as where no such damage occurs. The reason is obvious. If a grower does a careful job of training a young tree in accordance with the central leader idea, and deer proceed to browse the tips of all the branches in addition to the "leader", the framework is severely upset. Instead, it seems advisable to do very little, if any, pruning during first 4 or 5 years, or until the tree becomes too high to permit browsing of the topmost branches. Such trees should be grown as rapidly as possible in the hope that they will soon outgrow the unorthodox pruning caused by the deer. In other words, we may as well grow some extra branches to compensate for the deer's lack of judgment. But, where deer are absent, the 2nd and 3rd years are very important as regards framework development.

* *

The Dixi Blueberry Not a Native of Dixie In the Dixi (Note the spelling) variety of blueberry we find a story of human interest. It was developed by Dr. Frederick D. Coville, the originator of a number of other varieties, shortly before his retirement. This variety may have been one of his favorites. Anyway, he decided to pass it on to posterity as his parting message. So he gave it the Latin name "Dixi" (I have spoken).

Fruit Notes

JUNE 25, 1948

Prepared by the Fruit Program Committee of the Extension Service
W. H. Thies, Extension Horticulturist

Contents

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

For Your Date Book -- July 20 and July 21
These are Farm and Home Week dates for fruit growers - the first for growers of small fruits and the second for growers of tree fruits. The place is University of Massachusetts in Amherst.

* * * * * * * * * * * *

Interested in Protecting Fruits Against Birds? If robins, catbirds and other feathered creatures are getting a major share of your blueberries or sweet cherries, you may want to provide a protective covering of tobacco cloth netting. This material may now be obtained in small quantities at reasonable cost. It comes in 11-yard widths. For further details, contact the compiler of FRUIT NOTES.

* * * * * * * * * * * *

Blossom Thinning with Naphthalene Acetic Acid
This magic material, which has proven so effective in holding apples on the tree at harvest time, is also effective in the removal of excess blossoms. Several growers have tried it this season, and careful tests are being conducted by members of the Experiment Station Staff. The results will be observed with real interest.

* * * * * * * * * * * *

Nursery Inspection Trips. The first of two nursery expeditions through eastern U. S., conducted by the members of the Pomology Department, will begin on June 28. This trip will involve nurseries along the Atlantic Seaboard as far south as Virginia. A second trip in August will take the group as far west as Iowa. These inspections for Trueness-to-Name which have been conducted since 1921, have cleared up variety mixtures amounting to hundreds of thousands of trees. Today most eastern nurseries are fairly free of misnamed trees.

* * * * * * * * * * * *

Apple Crop Prospects. (Statement prepared by C. D. Stevens and A. C. Hackendorf of the N. E. Crop Reporting Service.) The United States apple crop in commercial areas is indicated by June 1 conditions to be moderately smaller than both last year and average. Prospects were reduced by poor pollination weather during May, especially in the Central States. The crop varies from one to two weeks earlier than last year in the East to about two weeks later in the Pacific Coast States.

For the Middle Atlantic States, a crop of about the same size as last year and moderately smaller than average seems probable. However, the lateness of the season, cool, rainy weather at bloom time, and the uncertainty as to the size of the June drop makes any statement hazardous at this time. In New York, frost damage was light except for a few Hudson Valley sites, but there was much rain and cold weather during the pollination period. In Pennsylvania, the heavy bloom in the important Adams-Franklin-York area did not produce a heavy set because of rain and frost at bloom time. Jonathans and Romes appear to have good prospects but Staymans, Delicious, and Yorks appear very light. In the South Atlantic States, growers report an unusually heavy drop during May and the crop prospect is now below average but about one half larger than the short 1947 crop. In the Central States, June 1 conditions indicate a smaller crop than last year in most States

and probably about two-thirds of an average crop for the area. For the western group of States, production should be fully as large as average but considerably below the record large 1947 crop.

* * * * * * * * * * * * * * * * * * *

SOME OBSERVATIONS ON POLLINATION AND FRUIT SET

In its simplest terms, the setting of fruit involves the transfer of pollen to the stigmatic surface of the pistil which, in the case of the apple, is a five parted affair. Apple pollen, unlike the pollen of the corn plant and of nut trees, is sticky and therefore is not carried in the wind. Insects, particularly bees, are essential. Successful pollination also implies flowers uninjured by frost and, in the case of self-unfruitful varieties, pollen of a suitable variety.

The McIntosh variety is notoriously self-unfruitful. Unless pollen of a so-called diploid variety such as Cortland, Delicious, Wealthy, Red Astrachan, Duchess, Early McIntosh, etc., is deposited on the stigmatic surface while it is receptive, the set of fruit is certain to be disappointing. Baldwin, Gravenstein, and other triploid varieties are not effective pollenizers.

This season there has been little or no frost injury to the blossoms, thus eliminating one of the adverse factors experienced in recent years. Cold, rainy weather during bloom, however, greatly interfered with bee activity. In some orchards, it is doubtful if the temperature was much above 60° at any time during bloom and, at best, the bees had very few hours suitable for normal activity.

Inclement weather during bloom along with a scarcity of bees in some orchards have provided ideal conditions for studying another factor, namely, the nearness of other varieties suitable for cross pollination. Careful observations have once more confirmed our opinion that a scarcity of pollinating varieties in our McIntosh blocks is greatly reducing the chance of cross pollination. We must make it easy for the bees, in a cold rainy season, to transfer pollen of the right kind from one tree to another without a lengthy flight. McIntosh trees alternating with Delicious or Cortland show, in general, a good set. Solid blocks of McIntosh show, on the average, a light set.

Many observations have been made of McIntosh trees immediately adjacent to a Red Astrachan or other good pollenizer. In these cases, we often find as many as two or three McIntosh apples on a single spur. This condition does not exist in the case of a solid McIntosh block.

To summarize the situation, we must make better provision for cross pollination as a means of insuring a set of fruit in a season such as this. Grafting one branch in every McIntosh tree to a good pollenizer next spring may return big dividends in the years to come.

* * * * * * * * * * * * * * * * * * *

We Visit Beltsville. A three-day visit to the Plant Industry Station at Beltsville, Maryland and to Washington, D.C., May 24 to 26, was most interesting and informative. A day and a half was spent in looking over experimental work and conferring with U.S.D.A. workers. New developments in small fruits and in tree fruits were reviewed. The more important observations will be presented in an early issue of FRUIT NOTES.

DO YOU KNOW?

That the bushel container we use in marketing apples frequently costs more than the pest control program? It is entirely possible, even under present day costs, to spray or dust an orchard very thoroughly as many as 8 times for as little as 30 cents per bushel, provided we get a large number of bushels per acre. One hundred dollars per acre for spray and dust materials seems like a heavy investment. But if a crop amounting to 500 bushels per acre is harvested, that means only 20 cents per bushel for materials. Labor and depreciation on equipment may add a similar amount. We frequently pay around 35 cents for a bushel box.

- - - - - - - - - - - -

That it costs more to establish a blueberry planting than it does for any of the other fruits grown in New England? This is true not only of tree fruits but of grapes, raspberries, strawberries, etc. The initial cost of blueberry plants for a 1-acre planting may amount to $500 or more. In view of this fact, soil and site must be very carefully selected in order to justify so large an initial investment.

- - - - - - - - - - - -

That the best way of lowering the cost of producing fruits is to grow more bushels, tons, or quarts per acre without greatly increasing the per acre investment? It costs about so much to fertilize, prune, spray and thin an acre of fruit trees. But we can lower the cost per bushel by getting more bushels per acre. Strawberries offer a striking example. The plants for an acre of land cost about so much. There is also a fairly fixed amount of labor in setting plants, placing runners, controlling weeds, and in mulching. Our chances of making a profit are greatly increased if we can produce 6,000 quarts per acre instead of 3,000.

- - - - - - - - - - - -

That the controllable factors in strawberry growing have greater influence on yields than the uncontrollable factors? We commonly blame the weather for a poor strawberry yield. But inclement weather may be largely offset by good management. A summer drought is less damaging on a good soil. Excessive rain during the harvest season causes fewer decayed berries if the planting has been properly fertilized. Deep freezing of the soil and consequent heaving of the plants may be avoided by mulching. The strawberry grower has more or less complete control over such factors as soil, variety, spacing, pest control, weed control and mulching. If the planting is otherwise o.k., unfavorable weather will cause much less reduction in yield.

- - - - - - - - - - - -

That hundreds of tons of poultry manure are being wasted on poultry farms by dumping in out of the way places? This valuable fertilizer should be put to use on farms within easy hauling distance. On a fruit farm, it may be used to good advantage in growing additional mulch material on meadow land outside the orchard or in growing young trees. It may even be used in moderation in early spring in the bearing orchard where the trees and the cover crop show a definite need of stimulation.

- - - - - - - - - - - -

That piles of prop poles and piles of apple wood in or near the orchard provide ideal hibernating quarters for codling moth? Where an old neglected orchard has been removed and the trees cut into firewood, numerous codling moth pupae are likely to be found under the old bark, from which the moths emerge to infest nearby trees. A number of years ago, trees in a Washington orchard nearest such a woodpile were so badly infested by codling moth the next summer that the owner picked all of the apples off when partially grown and destroyed them.

- - - - - - - - - - - -

That a sawdust mulch tends to steal nitrogen from nearby trees or shrubs? The reason is briefly this: Sawdust is high in carbon and very low in nitrogen. The organisms responsible for the decay of sawdust themselves require nitrogen. They take it from the soil and thus they offer strong competition to nearby plants. A tree or shrub mulched with sawdust and given no extra nitrogen may show yellowish leaves and make poor growth. But if additional nitrogen is used, the sawdust exerts a beneficial influence, particularly in stabilizing the moisture supply. Blueberries mulched with sawdust are likely to require twice the normal application of nitrogen.

- - - - - - - - - - -

That the apples in the top of a tree have better color not alone because they receive more sunlight but because the leaves from which the apples obtain needed growth materials are better exposed to light than the leaves on the inside of the tree? Those topmost apples have other advantages. The wood on which they grow is,in general,younger. It therefore has a better conducting system than the older, shaded, drooping parts of the tree. Such apples are literally "looking up" in more ways than one. In pruning a bearing tree we strive to eliminate, so far as possible, the poorly located branches instead of cutting out the vigorous parts of the tree in the hope of invigorating the others.

- - - - - - - - - - -

That an inconvenient water supply is one of the biggest drawbacks in the entire spray program? When we buy a power sprayer we invest a considerable sum of money for one purpose, namely, to apply spray materials. It is not a suitable piece of equipment for hauling water. If we must go down the road half a mile to fill the spray tank we are wasting very valuable time. A nearby water hole, or a supply tank used for nothing but hauling water to the sprayer, helps greatly to increase the efficiency of the spraying equipment. An apple orchard should be completely covered in not to exceed three days. Spraying time may often be cut in half by bringing the water to the sprayer instead of using it as a vehicle for cruising the countryside in search of water.

- - - - - - - - - - -

That there may be as many as 8 broods of red mite in a single season? In hot weather a brood may complete its life cycle in as short a time as 11 days. This helps to explain the heavy build-up in some orchards even though relatively few over-wintering eggs were observed. Three factors seem to influence the summer buildup -- number of overwintered eggs, natural enemies, and weather.

- - - - - - - - - - -

That an apple tree with a "snowball bloom" may set a heavy crop even though no more than 4% (1 in 25) of the blossoms set fruit? This assumes 5 blossoms to the spur. One good apple on every fifth spur may be all the trees should carry. A spacing of 8 or 10 inches is quite ideal.

- - - - - - - - - - -

That purification of the air in an apple storage is a practical means of preventing storage scald? Canisters of activated charcoal have been found highly effective for this purpose. Details of this new development will be presented in an early issue of FRUIT NOTES.

- - - - - - - - - - -

That the red banded leaf roller, long considered a minor apple pest in Massachusetts, has suddenly become a major pest in many orchards? In 1947 this insect was more troublesome, in general, than codling moth. It took a heavy toll in some of the orchards in the Nashoba area. A thorough application of lead arsenate in the calyx andthe first cover sprays, paying particular attention to the underside of the leaves on the inside of the tree, is an effective means of combatting the first brood.

- - - - - - - - - - -

News Item Joe McIntosh of Scabville has found a long-looked-for helping hand ----- at the end of his own arm.

That a peculiar pinched and greenish appearance around the calyx end of an apple is due to an alternate host disease, known as quince rust? Delicious, Gravenstein, etc., are particularly susceptible. Where the alternate host plant, the common juniper, is found in large numbers nearby, heavy infections may be expected unless particular attention is paid to early season control through the use of Fermate.

- - - - - - - - - - - -

That young fruit trees including apples and peaches should make a terminal growth of at least 18 in. the first year? It is a serious mistake to allow newly set trees to get off to a slow start. Everything needed to induce strong growth the first season should receive attention. These include a good soil, early planting, a little extra nitrogen, mulching, and in a dry season, watering.

- - - - - - - - - - - -

That the secondary spread of apple scab, unlike primary infections, comes about only as a result of rain washing and splashing the summer spores from one part of a tree to another? Scab spots on leaves in the top of the tree are obviously more menacing than those on lower branches. The summer spores, unlike the ascospores, are not carried to any extent by air currents.

- - - - - - - - - - - -

That the suffix "cide" implies a destroyer or killer of one kind or another? Examples are found in such terms as fungicide, insecticide, larvacide, rodenticide, ovicide, bactericide, etc. In this age of specialization we have come to look upon a material as having a specific effect upon one type of organism or upon one stage in its life history.

- - - - - - - - - - - -

That, in many fields we are now tilling the subsoil of grandfather's day? One has only to examine the surface soil at the top of a badly eroded slope to detect definite subsoil characteristics. A similar textured strata might be found at a depth of several feet at the bottom of a slope. It is no wonder that some parts of our present fields produce so poorly. The problem is not so much one of adding chemical fertilizers as of modifying the soil texture. A liberal addition of organic matter in the form of a mulch, applications of high magnesium lime and a complete fertilizer will help greatly to restore such areas to their former productiveness.

- - - - - - - - - - - -

That the commonly recommended practice of trimming the roots of strawberry plants at setting times is for convenience in transplanting and not because the plants make better growth? A review of half a dozen bulletins reveals no hint of superior performance of the plants. But most of the authors refer to the fact that the removal of long, straggly roots speeds up the planting partly because one doesn't have to dig so deep a hole.

- - - - - - - - - - - -

* * * * * * * * * * * * * * * * * * * *

RED APPLE CLUB

The Red Apple Club, an honorary fraternity among apple growers in Massachusetts, will be conducted again this season. During the latter part of the summer an opportunity will be offered any interested Massachusetts grower with 5 acres or more to apply for Club membership. The requirements based on one variety are as follows:

(1) The crop must score at least 90% free from insect and disease blemishes. (2) Grade at least 65% U. S. Fancy, and (3) Yield at least 200 bushels per acre if trees are less than 15 years of age, 300 bushels per acre if trees are 15 to 20 years of age, and 400 bushels per acre if trees are more than 20 years of age. A simple spray and dust record will also be required.

Killing of rats by one means or another has been attempted as far back as history records. The results are usually temporary and must be repeated over and over again. Killing has been placed last in the rat control program for several reasons. Among these are the smartness of the rat itself, the knowledge and care required to use poison successfully, the rapid population increase rate of rats, and the failure in the past of those who have relied on killing alone as a control measure. This method is more successful and is least required where sanitation and rat proofing measures have been established and maintained.

* * * * * * * * * * * * * * * * * * * *

"No Dollars - No Dice", F. A. Motz, Foreign Marketing Specialist, U.S.D.A. speaking before The Centennial Fruit Congress in St. Louis, Missouri, painted a dark picture for the future of fruit exports to European countries. Mr. Motz said the situation could be explained in four words: "No Dollars - No Dice". The relief programs may include some fruit, but until European nations resume production of articles they can exchange for U. S. credit, there is little hope of resuming apple shipments to Europe on prewar scale.

* * * * * * * * * * * * * * * * * * * *

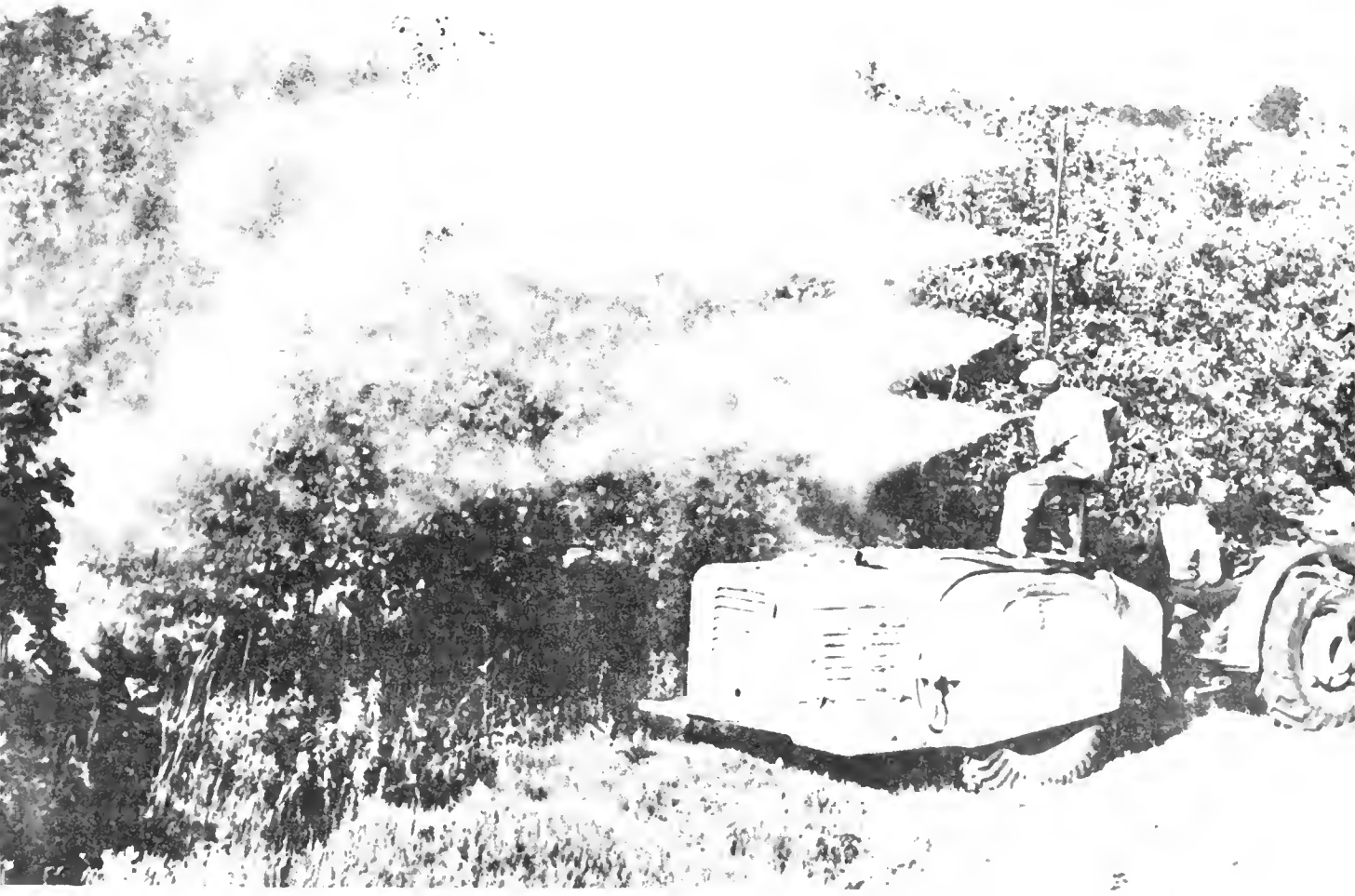
PRESSURE LOSS IN SPRAY HOSE AT DIFFERENT RATES OF FLOW

The working pressure at the spray nozzle is much more significant than the pressure at the guage. This is especially true where a large amount of spray material is delivered through a spray hose of small diameter. The following figures indicate the heavy losses in pressure where small diameter spray hose is used with a pump of large capacity.

Flow in Gallons per minute at 600 lbs. pressure	Pressure loss in pounds per sq. in., for 50-ft. length of hose with fittings		
Hose:	3/8 in.	1/2 in.	3/4 in.
5	90	18	
6	130	25	
7	175	35	
8	225	45	
9	275	55	
10	325	65	
15		125	20
20		250	40
25			60
30			85
35			125
40			150
45			185
50			240

Fruit Notes

JULY 30, 1948



Prepared by the Fruit Program Committee of the Extension Service
W. H. Thies, Extension Horticulturist

Contents

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

FRUIT VARIETY TESTING PROGRAM

One of the important services which the Pomology Department carries on for the fruit grower is the testing and evaluating of fruit varieties. The total number of varieties of all fruits being grown in the University of Massachusetts plantings is well over 500. Not all of these are under active test, since in the case of apples, especially, we are preserving a goodly number of old varieties which have only historic value. However, the list of newer named varieties and numbered seedlings under active test at present includes about 50 apples, 35 pears, 50 peaches, 20 plums, 20 cherries, 25 strawberries, 20 raspberries, 10 blackberries, 40 blueberries, and 40 grapes.

The Department issues a list of varieties recommended for commercial and home planting as well as a list of varieties suggested for trial only. These lists are revised each winter and are available to anyone who is interested.

-- A. P. French

* * * * * * * * * * * * * * * * * * *

Fruit Thinning, An Old Practice. Long before the removal of excess fruits became a common practice or chemical thinning was even dreamed of, a Massachusetts apple grower is reported to have done something about this age-old problem. Robert Manning of Salem who was growing apples in the middle 1830's found that his Baldwin trees were bearing fruit every two years. One spring he went thru his orchard and picked the blossoms off every other tree (we'll assume small sized trees). The untouched trees bore fruit that year, and the following year the remaining trees bore a crop. This probably marks the first attempt at blossom thinning.

* * * * * * * * * * * * * * * * * * *

What Limits Plant Growth? Air and water plus energy from the sun are responsible for about 95% of the total weight of growing plants, but the 5% furnished by the soil determines the yield. Even though weather conditions are almost perfect yields may be low because the 5% furnished by the soil is limiting the plant in utilizing the other 95%. And to complicate the matter, plants aren't as fortunate as cattle. They can't break through the fence and go where there is more food.

* * * * * * * * * * * * * * * * * * *

Delicious, Our Most Widely Grown Apple Variety. Based on average annual production for the years 1942-46, the Delicious apple crop in the U. S. amounted to a little more than 20,000,000 bushels or about 1/6 of the national crop. The variety next in importance is Winesap with about 12,000,000 bushels. McIntosh is third and Jonathan fourth with about eight and seven million bushels respectively. Rome Beauty, York Imperial, and Stayman come next in order with approximately six million bushels each.

* * * * * * * * * * * * * * * * * * *

CHEMICAL WEEDING OF STRAWBERRIES

With the development of a host of chemical weed killers, the question naturally arises, can any of these be used to weed strawberries? The information available to answer this question is very limited but it does suggest that certain materials are worth further trial. Among these the sodium salt of 2,4-D is probably being given the most extensive trial.

An attempt to find a chemical weed killer for strawberries is being made in the Pomology plantings at Amherst. Plots have been laid out both in a newly set and in a fruiting bed.

While it is too early to draw any conclusions, control in the newly set bed looks more promising than in the fruiting bed. Pre- or post-planting treatments with the sodium salt of 2,4-D are being tried along with several other chemicals and chemical combinations. These plots will be available for inspection during Farm and Home Days.

-- J. S. Bailey

* *

AIR PURIFICATION FOR APPLES IN COLD STORAGE

Following the past storage season apple storage operators may be interested in slowing down the rate of ripening, softening, and severity of storage scald of this fruit. Recent commercial trials in New York State have shown that air-purification with activiated charcoal cannisters has added from 4 to 6 weeks to the storage life of McIntosh (based on firmness of flesh) and controlled storage scald as well or better than shredded oiled paper.

What does air purification do?

As apples ripen they produce a number of organic gases some of which give apples their characteristic aroma. Ethylene, an odorless gas, is one of them and when present in very small amounts is capable of stimulating the rate of ripening of firm ripe apples. This gas is produced in increasing amounts as the fruit ripens until a peak is reached, and then gradually declines. Drops, and fruit that has been off the tree for several weeks, generally produce more ethylene than freshly picked fruit in a firm ripe condition. Consequently, later picked apples can be stimulated in ripening by ethylene produced by drop fruit or earlier picked apples that are in the same storage room. Also, other gases produced by riper lots of apples can greatly increase the severity of storage scald on those apples that are harvested and stored later.

Considerable work has been done attempting to remove these ripening and scald gases from the storage room air. The use of a special activated charcoal has been found most suitable for this purpose. Occasionally growers have a problem with foul odors in storage originating from boxes, other produce, etc., which tend to give an undesirable flavor to the apples. Activated carbon will cleanse the air of a great many of these odors, also.

What is involved?

In order to install an air-purification unit one must have a forced air cold diffuser or a blower unit which provides good air movement throughout the room at all times. Good air circulation is of primary importance since removal of organic gases cannot be complete and effective unless all of the air in a room is being constantly cleansed.

It is necessary to have about one canister for every 200 to 250 bushels of fruit. These canisters, containing 1.5 pounds of carbon each, are mounted on a manifold which in turn is installed in a wooden or sheet metal housing. To this housing is connected an auxiliary fan which draws air through the canisters and discharges clean air into the intake side of the cold diffuser. A diagram of a canister and a general arrangement of the unit is shown below.

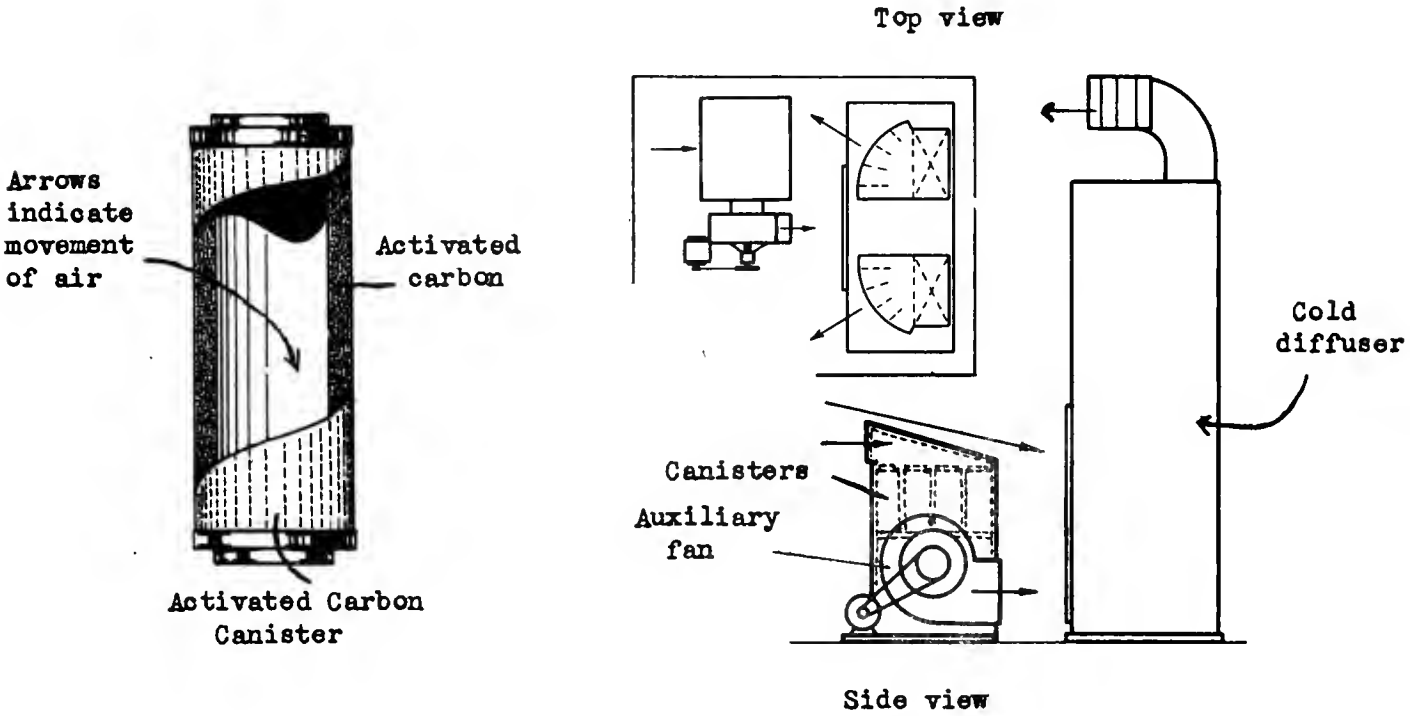


Diagram of Activated Carbon Canister and Arrangement Necessary for Their Installation as an Air Purification Unit in an Apple Cold Storage Room.

It is estimated that such an installation will cost approximately 6 cents a bushel. Yearly maintenance 0.5 cents a bushel. After each season the canisters are returned to the manufacturer who reactivates the carbon and puts it back in the canister.

For those who may be interested in air-purification, more information may be obtained from the Pomology Department, University of Massachusetts, Amherst, Massachusetts.

PROGRESS REPORT ON CHEMICAL THINNING TESTS

Chemical thinning tests were conducted at Amherst and in three commercial apple orchards using the dinitro materials (DN #1 and Elgetol) at blossom time and the sodium salt of naphthaleneacetic acid (App-L-Set) at calyx time and two and four weeks after calyx. One test on Halehaven peaches was conducted using three dinitro materials (DN #1, DN #289, and Elgetol) at blossom time.

Although the bloom was heavy, the weather, except for the first two or three days when apple flowers commenced to open, was not conducive to a heavy set. During the bulk of the blooming period, cool, rainy weather limited the extent of pollination. Under these conditions the set was not nearly as great as the bloom indicated it might be. Elgetol applied to Red Astrachan, Baldwin and Duchess resulted in much more thinning and foliage injury than similar single or double applications of DN #1. Where the set was heavy enough to warrant thinning on Yellow Transparent, Wealthy, Duchess, and Early McIntosh, DN #1 gave satisfactory results. It no longer seems desirable to consider the liquid dinitro materials for blossom thinning of apples. In the peach test, DN #289 reduced the set more than equivalent concentrations of either DN #1 or Elgetol.

Applications of 8 oz. of App-L-Set per 100 gallons of spray at calyx time eliminated the crop on Duchess apple trees and resulted in severe leaf dwarfing and distortion. Calyx applications of this material to Wealthy, McIntosh, and in some instances Early McIntosh, thinned satisfactorily at calyx time with much less foliage injury. App-L-Set appears to be more injurious to apple foliage when applied shortly after bloom than it does when used at the same or higher concentrations two and four weeks after calyx.

Tests at Amherst and in one grower's orchard, using up to 12 and 20 ounces of App-L-Set per 100 gallons of spray two and four weeks, respectively, after calyx on McIntosh, Golden Delicious, and Early McIntosh, show that chemical thinning can be accomplished at this late date. A treatment that can be made as late as four weeks after calyx has one distinct advantage over bloom or calyx applications since the extent of fruit setting and the necessity for thinning can be rather accurately determined by that time. Of course, the earlier thinning can be done, the greater are the chances of obtaining desirable commercial size with the least reduction in yield and of making alternate bearing varieties bear more uniform, annual crops.

-- F. W. Southwick and W. D. Weeks

* *

LATE-SEASON CONTROL OF APPLE SCAB

The surest way to prevent late season infection of apple Scab is to have no leaf or fruit infection when the first of August arrives. Very few McIntosh growers in Massachusetts are in that position that year -- or in any year for that matter. As long as active Scab spots are present in the trees, in the top branches in particular, there is danger of fruit infection, particularly (1) after the spray deposit from the last cover spray becomes outgrown or is weathered away, and (2) if continuous or intermittent wet periods of sufficient duration occur during August or September.

This year when many orchards show dangerous amounts of active Scab on the foliage, even though very light infections may exist on the fruits, growers need to know certain facts about requirements for fruit infection during the period

between the last usual cover spray and harvest time. Based upon artificial infection experiments, using McIntosh apples in New York State several years ago, pathologists found that wet periods of at least 40 to 45 hours are necessary for Scab infection during the first half of August, while the fruit must remain wet for 3 to 4 days to allow infection during late August and early September.

This means that there still is time to head off an infection of unprotected fruits if an application of sulfur dust or wettable sulfur spray is made (1) after a wet period in the first half of August has progressed to the 30 to 35 hour period and promises to extend still further, or (2) after a 2- to 3-day wet period in late August or early September.

Although no definite information is available on length of wetting period required for late season leaf infection, observations indicate that the upper surface of well matured leaves may require nearly as long a period as the fruits. The under surface of leaves is much more readily infected during August and September than the upper surface.

In considering standard spray materials possessing the longest protective properties for late season Scab control, the sulfurs rank first. Full strength Fermate in the late cover applications commonly allows considerable under-surface leaf infection during August and September, whereas good protection may be maintained from its use during the same period on the apples. Spray residues of wettable sulfur, or sulfur plus Fermate, outlast Fermate alone for leaf protection -- and probably also for fruit protection.

-- O. C. Boyd

* *

FRUIT INSECTS IN MIDSUMMER -- 1948

Fruit insect pests have made this an interesting season for the entomologist -- perhaps a hectic one for the grower. Or, should I say that insect pests are making this a tough season -- because they are not through yet. Of that unfortunate fact, we can be sure.

Let's review a few of the outstanding developments, note our mistakes and make plans to correct them before we forget what they were and how important they became as the season progressed.

PEACHES - The BHC-DDT combination appears to have done an excellent job for peach growers and has not caused injury. In a few cases those late Curculios did some damage after the final application had lost its effectiveness but the Oriental Fruit Moth never got started in the terminals where the three applications of DDT were applied at weekly intervals. Injury by Tarnished Plant Bug was also reduced, but an early -- real early -- petal-fall application of DDT would improve the control of this pest. There are too many peach trees being weakened or destroyed by the Peach Tree Borer. It is now so practicable to control that insect with DDT that I hope growers really do a good job and thus lengthen the productive life of their trees.

PEARS - Some excellent reduction in Pear Psylla early broods have been obtained with dormant oils applied before many eggs had been laid. DN materials including the new DN-289 were good ovicides, but many eggs were laid after they could no longer be applied safely. Nicotine sulphate alone and with summer oil have been effective against the nymphs of summer broods.

APPLES - This year the major insect pests of apples have been - or are now - Plum Curculio, Bud Moth, Red-banded Leafroller, Codling Moth, European Red Mite (or in some areas the Clover Mite). Still to be accounted for are late Red-banded Leafroller, summer brood Bud Moth, second brood Codling Moth and Apple Maggot. Mites and Aphids might require additional measures also.

The prolonged period of emergence, feeding and egg laying by Plum Curculio make it outstanding at present in actual damage caused to fruit. Heavy rains washed sprays off and it seemed almost impossible to maintain effective protection.

Overwintering Bud Moths were killed effectively by dormant applications of DN materials. Many orchards, however, provide excellent demonstrations of the necessity for complete coverage. They also point out the increased insect control to be gained by pruning off those low-hanging branches which are hard to hit thoroughly. Control of the summer brood and the final damage to the fruit will depend upon how well growers have applied sprays to the undersides of the foliage during the latter part of July. Applications of oil and nicotine in delayed dormant or even the thorough underneath application of lead arsenate and DDT in early sprays were quite effective also.

Red-banded Leafroller needs watching. Satisfactory control of this insect is impossible by ordinary spraying methods in trees which are not pruned, are full of watersprouts or hang right down into the grass. It is not an easy insect to kill, but all the evidence points towards the use of DDT plus lead arsenate in one application to the right place at the right time. The place is the undersides of all the leaves and the time is during the last week of July and first two weeks in August. Of course, the real time was back at Calyx, 1st and 2nd Cover periods.

Codling Moth seems to be under control where protection with DDT was complete throughout its rather extended active period. The first brood was late and we do not know yet how extensive the second brood may become.

European Red Mite has caused a great deal of damage although I am sure some growers with Red Mite injury do not realize it. It showed up first on Baldwins and Delicious and then on other varieties. The picture is complicated by serious outbreaks of Clover Mites in at least one area. The Two-Spotted Mite still has time to come into the picture.

With good oils available -- and they will be if growers demand them -- it seems unnecessary to endure the "run around" for summer Red Mite control I have witnessed recently. At present summer control measures are expensive, likely to be injurious and many times are ineffective. Let hindsight remind us, now, to use foresight in 1949 and to control the European Red Mite early with the proper applications of a good oil.

Apple Maggot fly emergence started late and reached a peak slowly. The additional emphasis upon summer Bud Moth, Red Mite and Red-banded Leafroller control in late July and August should have helped also to control this pest.

-- E. H. Wheeler

* *

Monthly Rodent Control Notes. The best time to prevent losses by rodents in farm storages is just previous to the actual storing of products. Controlling rats or mice after the storage room is filled is difficult and expensive. (Carl Henry)

OBSERVATIONS IN TWO ORCHARDS (Two successful growers, both former presidents of the MFGA, were asked this month to present their observations on anything of interest in their individual orchards. Their comments are well worth reading.)

Artificial Pollination. "In 1947 we planned to dust a large block with pollen from an airplane. For various reasons we did not do it, but had a bumper crop on what has always been a shy bearing orchard. Had we dusted with pollen we would have given the credit to that.

"This year we tried bee inserts on the hives in several blocks. The patented insert we used induced most of the bees to walk through a tray of pollen on their way out of the hive. It looked as if the bees could not help but carry a load of good pollen on every trip. We used some pollen (Wealthy) that we gathered ourselves and some that we purchased. Germination tests on both were made in Amherst and pronounced o.k.

"We were also careful to replace the pollen about every two hours as we knew it would deteriorate from the light and heat of the hive. In the blocks where the inserts were used, we had slightly more than a colony of bees to the acre. One was a McIntosh block and the other Delicious both of which were short of pollenizing varieties. Both have grafts that are not yet in bearing.

"As to the results: Both blocks have practically no apples at all. The Delicious block has four trees adjacent to a Jonathan tree that are loaded. No other pollinating varieties seemed to affect the Delicious. The McIntosh block has a good crop adjacent to Astrachan, and some apples near Wealthy and Cortland. Delicious pollenizers appeared to be worthless for McIntosh this year. As to conclusions: I will let you draw your own. We are not convinced that the method is worthless. However, our faith is badly shaken."

(Jonathan Davis, Sterling Junction)

Chemical Thinning and Other Observations.

"A hormone material applied as a thinning spray at double the strength normally used to prevent drop, did a fine job on Wealthies, and little hand thinning was needed. A few weaker trees were thinned too much. Early McIntosh were also thinned too heavily. Next time I will use 6 oz. instead of 8 oz. per 100 gallons. Foliage on both varieties still shows the effects of the thinning spray. During the first few days the trees looked as if something had shut off the water supply. Another test I have made is Eastern vs. Western lead arsenate, two rows of each all season. (So far no difference has been noted.) More Russet on all varieties this season. Rosy Aphis plentiful on Cortland. No Leafhoppers this year in spite of a straight lead arsenate program. DDT last year must have finished them.

(Travel Note) - Leaf Curling Midge has arrived in Brimfield.

Phygon has apparently done a good job in controlling Scab with fewer applications and longer intervals between sprays. Very little effect on the foliage has been observed. Growers in this section are wondering if a slight yellowing near the edge of McIntosh foliage is due to frequent, heavy applications of finely divided sulphur."

(Walker Cheney, Brimfield)

* * * * * * * * * * * * * * * * * *

AMERICAN INSTITUTE OF COOPERATION COMING TO STATE UNIVERSITY IN AUGUST

The University of Massachusetts becomes the hub of the American farm world for four days this summer, when the American Institute of Cooperation meets here August 30 through September 2. Leaders of the farmer cooperative movement, members of cooperatives, educators from colleges and universities, administrators, and farmers themselves will gather from all parts of the nation to discuss cooperation, to get acquainted with one another and with common problems and to enjoy the varied attractions of New England.

Recreation and sociability will center around a Gay Nineties Barbershop Quartet, a New England seafood dinner, a square dance festival, and a special pageant staged by the Michigan Farm Bureau. Nearly 100 young people from Michigan will journey to Amherst for this event. The pageant will portray the role of young people in cooperatives. The local committee on arrangements is headed by Dr. Adrian H. Lindsey, head of the department of agricultural economics at the State University. Theme of the institute is Farmer Cooperatives as a Part of the American Economy.

Two special sessions will precede the main conference. These will come the morning of August 30. One is a conference to discuss extension teaching in the field of farmer cooperatives. The other a special conference of cooperative information editors. The latter will include a luncheon. The main conference will get underway that afternoon.

Two special schools will also be held in advance of the conference. August 16 to 27 at the University a college course on the Principles of Cooperation. This is for college credit. Cooperative Education will be the subject of a workshop which will meet from August 23 to 27. And another workshop on the subject of Cooperative Education for Residents of the Community will be held August 27 and 28.

Registration blanks for advance registration may be obtained from Roy E. Moser, Stockbridge Hall, University of Massachusetts, Amherst. Reservations for the New England Seafood Dinner must be completed by August 21. Headquarters for the Institute will be in Memorial Hall on the University campus.

* * * * * * * * * * * * * * * * * * *

FARM ENEMY NO. 1

WANTED: For sabotage, robbery, murder!

REWARD: Millions of dollars in savings!

WARNING: He is savage! Kill him on sight!

* He has the world's worst name --"Rat".
* He runs with a big gang -- an estimated 150,000,000 rats in the United States.
* He spreads disease among people and animals.
* He murders chickens and young livestock in cold blood.
* He takes a 200,000,000 bushel cut of America's grain crop.
* He is trying to sabotage our Nation's food production.

WAR HAS BEEN DECLARED AGAINST THE RAT! JOIN THE FIGHT!

* * * * * * * * * * * * * * * * * * *

Fruit Notes

August 30, 1948

"The New England Seven"

In 1928, seven apple varieties were favored for commercial planting in New England. An appraisal of this list, 20 years later, is presented on Page 1.

Prepared by the Fruit Program Committee of the Extension Service
W. H. Thies, Extension Horticulturist

Contents

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

THE NEW ENGLAND SEVEN

Horticultural authorities in New England got together in 1928 and prepared a list of apple varieties best adapted to commercial planting at that time. The seven varieties on this list were Baldwin, Delicious, Gravenstein, McIntosh, Northern Spy, R. I. Greening and Wealthy. It was not the intent to advocate the planting of all of these varieties in every New England orchard, but to provide a list from which three or more well adapted varieties might be selected. When the list was published the prediction was made that the next decade would find one or more of these varieties waning in popularity. It was also felt that some of them would gradually be supplanted by newer sorts. It is not surprising, therefore, that our attitude has changed as regards variety recommendations during the intervening years. A list prepared today would differ considerably from that of 20 years ago.

Speaking for Massachusetts alone, and without any attempt to convey the attitude in the other New England states, our present day appraisal of the above mentioned varieties might be summarized as follows: Baldwin Still considered a good apple although not being planted at all extensively. Many trees damaged or killed by the cold winter of 1933-4. Production not much more than half that of 1928, but will continue to occupy a place of some importance on our markets for many years. Delicious Would undoubtedly be included in a similar list today although few growers produce this variety at its best. Size, color and yield frequently leave much to be desired. Where conditions are favorable and a high percentage of Fancy fruit is grown, this variety has proven profitable. One of its claims to a place on the list is its influence as a pollenizer. Gravenstein In spite of its excellence for pie or sauce and as an eating apple, this variety seems to be on the way out. Cold winters have taken a toll and few trees are being planted. The red sports are providing a partial substitute for this good old variety. McIntosh Our Number 1 commercial variety which makes up at least 60% of the total crop, compared with 25% in 1925 and 40% in 1940. It is fully as popular as in 1928 and promises to top the list for years to come. A further increase in the percentage of McIntosh, however, should not be encouraged. Northern Spy This good old variety occupies a very minor place in our commercial plantings. It is popular with consumers although growers find it relatively unprofitable because of its biennial tendency, slowness in coming into bearing, smaller percentage of Fancy fruit and a very tender skin. R. I. Greening Of interest in only a few markets. Very few trees being planted. A good cooking apple, but might not find a place on a present day list. Wealthy Popularity waning. Still a considerable number of trees in commercial orchards although not being planted by most growers. Variety cannot compete with McIntosh. Was widely planted as a filler tree. Production will decline as these are removed.

If a list of seven commercial varieties were prepared today, it would certainly include Cortland and probably Early McIntosh. Gallia Beauty deserves attention as a partial substitute for Baldwin. Red sports of Delicious, Gravenstein, Baldwin and others should be considered wherever these varieties are being planted. And since the New England Seven included three varieties (R. I. Greening, Gravenstein and Baldwin) which are ineffective as pollenizers, Golden Delicious, certain McIntosh relatives such as Macoun and Milton and other good pollenizers assume a role of some importance, particularly in the production of McIntosh, a self-unfruitful variety.

* * * * * * * * * * * * * * * * *

HARVESTING POINTERS

Avoid Bruises: Not only do bruises and skin punctures detract from the appearance of the fruit and offer places for the entrance of decay organisms, but they also tend to hasten the rate of softening and moisture loss. Experiments have shown that even one bruise can appreciably hasten the rate of softening of the uninjured portions of the fruit and may increase the moisture loss by as much as 400 percent.

Moisten Boxes: If apples are to be stored in field crates or wooden boxes it is desirable that they be well moistened before they go into storage or very shortly thereafter. Dry wooden crates may absorb up to 1/2 pound of moisture apiece from the storage room air. Since moisture absorbed from the storage room air comes largely from the fruit, it is very desirable that the boxes be well soaked. Add moisture regularly so that the relative humidity is maintained at 85 to 90 percent. Apples will show visible shriveling when they lose approximately 5 percent of their weight as water vapor.

Cool Apples Quickly: It is estimated that apples will lose approximately one week of their storage life for every day they remain out of cold storage after harvest. Also, as apples ripen they produce a volatile substance, ethylene, which will hasten the ripening of less mature fruits. A few bushels of ripe Early McIntosh or McIntosh drops, for instance, can produce enough ethylene to shorten the storage life of a lot of firm, ripe McIntosh by as much as six weeks. Also, other vapors from ripe apples are capable of greatly accentuating the severity of storage scald on susceptible varieties like Cortland. Consequently, store apples promptly and if possible keep early apples, drops, and rather ripe, later picked fruit in separate rooms from those apples which are picked in a firm ripe condition and are to be held for extended periods in storage.

-- F. W. Southwick

* *

OBSERVATIONS OF APPLE MAGGOT FLY EMERGENCE

The weekly reports of the day by day emergence of Apple Maggot flies provide interesting reading for those who believe their maggot troubles are caused, at least partly, by late-emerging flies. Roger Peck, Dorrance Green and Ralph Roberts have reported on apple maggot fly emergence in traps located in Shelburne, Wilbraham and Granville respectively.

From August 1 through August 15 these cooperators have reported, from their areas, fly emergence equal to the following percentages of their summer totals: Wilbraham 27%; Granville 20%; and Shelburne 42%. And, in addition, Ralph Roberts reports that 18 flies have emerged in late July and August from a box of maggot pupae placed in the ground in 1946.

Even when we disregard migrating flies -- which we cannot afford to do -- the above figures give us many reasons for continuing our protection against Apple Maggot well into August.

-- E. H. Wheeler

* *

UMBRELLAS FOR INSECTS

Are you growing umbrellas for the insects in your orchard? Take a look now -- before the harvest gets into high gear. Step inside the trees. Are there any openings to the outside? Would you or any pest get wet if a broom or spray-mast, in action, went by the tree? Are branches with moderate or light loads of fruit, touching the ground? In other words, you will do a better job of pruning next winter and spring if you examine your trees now while in full foliage. And good pruning is the first step towards good pest control in 1949.

The need of open trees which allow sprays and dusts to be directed to the inside of the tree and undersides of the foliage is emphasized by two factors. First, perhaps, is the increased use of spray-masts, heads or booms of various kinds. The man behind a gun could, if he would, pick out openings in a tree and, by adjusting the gun, take advantage of them. Where mechanical arrangements are employed for directing the spray, the opening to the inside of the tree must be provided by proper pruning.

Secondly, but no less important, is the presence of such pests as the summer-brood Bud Moth, the several mites and the Red-banded Leafroller in addition to Codling Moth. In spite of improvements in insecticides, thorough coverage is still most important when controlling these insects and mites. Thorough coverage of all twigs and branches, both high and low, is essential for good Bud Moth and mite control by early spring applications. How many of those hard-to-hit places could you eliminate without reducing your crop?

Your trees will look a great deal different when pruning time comes around. Take a brush and a can of paint with you to a few typical Baldwins, Greenings, Cortlands or any others that look like umbrellas. Step inside and mark the branches and limbs that need to come out. Also mark the ones that need thinning. These trees can then be used as guides to a better pruning job and improved insect control in 1949.

-- E. H. Wheeler

* *

PRUNING TO IMPROVE SIZE AND COLOR OF FRUIT

The harvest season is an ideal time to observe the effects of previous pruning and to lay plans for the next pruning session. Pruning, if it has any purpose at all, is designed to accomplish one or more of the following: (1) lower the per bushel cost of production, (2) increase the percentage of salable fruit, (3) eliminate low grade fruit at the source by preventing its development. This applies to fruit color and size as well as pest blemishes.

In the preceding article the relation of pruning to insect control has been stressed. Let's carry the thought one step farther and talk about those little, green apples of poor quality. Once upon a time certain horticultural teachers emphasized the low headed, open center tree. "Cut a big hole in the top and let the light in", they advocated, not realizing that in so doing they were eliminating vigorous fruiting wood. This method meant cutting out young, upright growing branches in the hope of invigorating the older, shaded wood.

This doctrine is based on wrong assumptions. One needs only to study the development of a bearing tree to sense the fallacy of continually sawing off those growths which extend upward and outward. Instead, it seems advisable to cut out

the older, drooping, shaded parts of limbs. A study of the kind of fruit produced on those handicapped parts of the tree at harvest time will reveal the reason. A secondary branch growing downward from the underside of a scaffold limb on a mature tree will tend to produce fruit of smaller size and poorer color. This is especially true if the branch is in dense shade, because the leaves from which the apple obtains its carbohydrates have poorer light exposure and are therefore less efficient.

Everything we do in the orchard is done with one objective in mind, -- the production of a profitable crop. When we prune a tree we have in mind more effective spraying, branch spacing and the retention of those parts of the tree which are most capable of bearing high grade fruit. Harvest time is the season when we can size up our pruning efforts and lay plans for next March when we again get out the pruning saw. We might mark for removal a few branches which are now producing low grade apples, instead of trying to invigorate those branches by removing younger, and therefore much more valuable parts of the tree.

A fruit spur may bear a good apple now and then for a period of about 8 or 10 years. When it has outlived its usefulness, the chances are the branch to which the spur is attached is partially overtopped by younger branches with younger spurs. In pruning, we therefore remove many of the older branches entirely instead of bothering with individual spur removal. Much can be done to improve the grade of fruit in most bearing trees by confining the cuts very largely to older branches an inch or less in diameter.

* *

NOTES ON MOUSE CONTROL

The practice of piling heavy mulch up to and against the base of fruit trees for the purpose of smothering the grass is one that appears to be growing in popularity among some commercial orchardists. Usually the intention of the grower is to remove the mulch from the tree base after harvest is completed. However, there have been instances where this operation was overlooked, and serious damage by mice resulted. Since orchard mice have been known to damage tree trunks and roots during every month of the year, and particularly during the early Fall months, placing of the mulch directly against the trunk of the tree is hazardous. Extra mulch should not be placed within three feet of the tree trunk, if mouse injury is to be prevented.

Damage of trees by mice is easily detected at this time of year. Trees with small, sparse, light-colored leaves and poor terminal growth should be examined for mouse injury. After the leaves fall, trees with any of these symptoms may be difficult to find or entirely forgotten. If marked now, extra care may be given these trees during the approaching Fall and Winter months and a better job of mouse eradication can be done.

Quite often trees damaged below the ground level by mice are located in sections of the orchard that are particularly favorable to mice. These areas should receive special attention and one or two extra poison bait applications.

Orchardists who have sections in their orchard where mice have been a problem and where control methods have been unsuccessful should contact their County Agricultural Agent for advice.

-- Carl B. Henry, Rodent Control Agent

* *

NOTES ON THE FALMOUTH STRAWBERRY CROP (County Agricultural Agent Bertram Tomlinson submits the following interesting comments on the strawberry situation in Barnstable County. What he says about yields in relation to cultural practices is especially significant.)

Cape strawberry growers enjoyed a fairly good harvest through the past season with prices ranging from 60¢ a quart wholesale for early shipments to a low point of 12¢ a quart during the height of the berry season. The weighted average price to growers ranged from 28¢ to 31¢, depending on the amount of early berries shipped in at the higher prices. Ordinarily, the harvest season gets underway about the second week in June and is completed by July 1st, but this year, for the second season in succession, the harvest carried through the first full week of July. This was because both 1947 and 1948 were characterized by unusually cold spring weather that retarded growth.

One of the most interesting features about the Cape crop is the tremendous yield received by the better growers and the rather high average yield for all growers. This year was no exception, for Jack Sambade of Teaticket actually shipped 26,000 quarts from his two-acre strawberry bed, and when he stopped shipping July 9, there seemed to be at least 1,000 quarts still on the vines. Furthermore, most of this crop was shipped in trays with baskets filled to make a high crown. Had these been packed for shipping in crates where the crown is much less, he would have had a much higher count, possibly 30,000 quarts instead of 26,000. While Mr. Sambade considers this a good yield, he also speaks of it as a normal yield if one has healthy, strong, well-developed plants, and a good growing season. Many growers in other areas may find it hard to believe this statement, but I know from my close observation of the Cape industry that yields of ten and twelve, and even fifteen, thousand quarts are not considered unusual. In fact, one grower this year was so worried about his crop that he put in an urgent plea for a visit to determine the trouble and remedy, if any. His field was examined carefully, and although he did have an abnormal condition brought on by heavy application of fertilizer in March and some danger from the two-spotted red spider now called red mite, he shipped 9,000 quarts from the plot slightly under one acre in size.

I believe no other area in the country can match the Falmouth area in this consistent high production, and the secret, in my opinion, is the care given during the first season when the beds are being made up. The prevailing custom is for rows to be planted 5½ feet apart, and the plants are spaced one foot apart. All daughter plants are hand spaced in straight rows, three on each side of the mother plant. In the fall, the beds consist of seven plants across the row allowing approximately 9" of space between plants. Growers are now giving more attention than ever before to cover cropping, and some of the better growers devote two full seasons to cover cropping before setting out the land to strawberry plants.

While the system of fertilization varies somewhat, the general practice is to apply a band of super-phosphate around each plant a week after setting in the spring, at the rate of 500 or 600 pounds per acre. Two or three weeks later, a similar application is made of 5-10-10 fertilizer or 4-12-4. This is cultivated in and clean culture is practiced to keep all weeds out of the patch. This usually means one hoeing in addition to several cultivations. About mid-July, another application of fertilizer is made, this time between the rows, applying 5 to 8 bags per acre, and this is cultivated in. Rakes are then used to pull the soil in towards the mother plant to form a bed three or four inches higher than the area between rows. Runner plants are handspaced through July and August if necessary, and all runners not needed are pulled off. Another application of fertilizer, 5 to 7 bags per acre, is applied as a topdressing in early September, and the following spring around the middle to latter part of March, the beds receive another application of fertilizer varying from 5 to 7 hundred pounds per

acre. Occasionally, growers exceed this quantity, but they have learned that heavy spring applications promote weed growth and berries are too soft to stand shipment.

Practically every variety known has been tried out by the Falmouth growers and tested under their soil conditions, but the Howard 17 has proven itself superior to any other variety during the past 25 years. In general, growers have been rather free from serious insect and disease problems during the past eight or ten years, but indications are that strawberry weevil is again on the increase, and growers must be alert throughout the year in order to maintain plants capable of high production.

* * * * * * * * * * * * * * * * * * * *

ERADICATION OF APPLE SCAB WITH MERCURI-ACETATE SPRAYS AFTER INFECTION

In 1945 the New York-New England Fruit Spray Specialists began to experiment with mercury sprays after Dr. Frank Howard, plant pathologist of the Rhode Island State College, gave us the results of his pioneer work with Puratized N5E.

In 1945, at Waltham, Puratized N5E performed sensationally in clearing up foliage scab. In 1946 and 1947, apparently the same mercury fungicide, bearing the name Puratized Agricultural Spray, used experimentally and commercially to eradicate scab gave variable, intriguing, and often disappointing results. In 1948 the results in general were better. When used as a protectant or preventive spray, the control of scab in these years of epidemics has been excellent and most satisfying.

This year at Waltham the scab eradicant action of other mercury sprays was studied. McIntosh trees were sprayed for the first time on June 2 (five days after calyx) when foliage scab was first evident. On June 14 the trees were sprayed a second time. These dates are 22 and 34 days after the first primary scab infections. Almost all of the foliage scab seemed to be eradicated after the first application of mercuri-acetate and mercuri-formamide, and eradication was definitely complete after the second application.

Mercuri-acetate gave the most satisfactory eradication and prevention of scab. Even the primary infections occurring in the rains of May 10-June 1, that had not yet appeared on June 2, were almost completely destroyed. These results can have important implications. If all of the primary incubating scab can be killed with early but poorly timed applications of mercuri-acetate as the results suggest and in addition provide good protectant or preventive action, the control of apple scab should be greatly simplified.

Mercuri-acetate is much superior to mercuri-lactate (Puratized Agricultural Spray) as an eradicant for scab. Its action is very positive. Cooperating growers this year obtained consistent and similar satisfying results with mercuri-acetate.

Interesting experiments are being planned for 1949, and we sincerely hope that the manufacturers can supply us with stable products of the same composition next year.

-- E. F. Guba

* * * * * * * * * * * * * * * * * * * *

PREVENTING PHYGON CHLOROSIS WITH EPSOM SALTS

Using beans for test plants in the greenhouse last winter, we observed that the addition of certain chemicals to the Phygon spray, notably sulfate salts, prevented Phygon chlorosis. Correction was obtained on beans with magnesium sulfate (epsom salts), manganese sulfate, and magnesium phosphate. Undoubtedly, had we continued our search we would have found others. Correction of chlorosis was obtained by the addition of as much chemical as Phygon.

This information was applied to our experimental orchard. We note that varieties differ with respect to Phygon foliage chlorosis, and they respond differently to correction of chlorosis with epsom salts under our test conditions at Waltham. McIntosh and Baldwin are very sensitive; Delicious not so sensitive. Correction of chlorosis by the addition of the same amount of epsom salts as Phygon was satisfactory on Baldwin and only partially satisfactory on McIntosh. Sulfur and insecticide (DDT and lead arsenate) on Baldwin this year caused severe russetting, stunting and cracking of the apples. Untreated trees showed no injury. Phygon and insecticide and epsom salts did not injure the finish, at least significantly. Further experimentation in 1949 is planned to determine the amount of epsom salts needed to give satisfactory rectification of Phygon chlorosis on McIntosh. Epsom salts added did not affect the potent fungicidal action of Phygon.

-- E. F. Guba

* * * * * * * * * * * * * * * * * * * *

APPLY NOW FOR RED APPLE CLUB MEMBERSHIP

Commercial apple growers in Massachusetts are again offered the opportunity of applying for membership in our honorary fraternity, the Red Apple Club. Last year we expressed a hope that at least 10 growers would qualify. To our surprise, the number mounted to 21. This year, with serious russetting in some orchards, low yield or pest injury in others, we again set 10 as a very creditable goal in number of Club members.

The rules of the Red Apple Club are few and simple:

(1) The crop must score at least 90% free from insect and disease blemishes. (2) Grade at least 65% U. S. Fancy, and (3) Yield at least 200 bushels per acre if trees are less than 15 years of age, 300 bushels per acre if trees are 15 to 20 years of age, and 400 bushels per acre if trees are more than 20 years of age. A simple spray and dust record will also be required. The only important changes over last year are: (1) An increase from one to three acres in the minimum acreage to be sampled, and in the larger orchards (15 acres or more) 20% of the total acreage. This will tend to eliminate the smaller blocks and it will mean the sampling of a larger proportion of the total crop. (2) The percentage of U. S. Fancy is increased from 60% to 65%.

Any reader of Fruit Notes who feels that his apple crop stands a chance of qualifying should contact his County Agricultural Agent by mail or telephone indicating when harvest will begin. The county office will have full information by September 30 concerning sampling and inspection.

* * * * * * * * * * * * * * * * * * * *

Fruit Notes

October 30, 1948

OP GRAFTING
TREES
FR BLUEBERRIES
in the
GARDEN
Growing Apples
THEIR CONTROL
GRAPE CULTURE
IN MASSACHUSETTS
STRAWBERRY GROWIN
IN MASSACHUSETTS
APPLE VARIETIES
APPLE PESTS
ESTABLISHING APPLE ORCHARDS
Home Use
DISEAS
of APPLE
IN
STORAGE
IN MASSACHUSETTS
Dwarf Fruit Trees
in the Home Garden

Prepared by the Departments of Pomology, Entomology, and Botany, and
Other Staff Members
Compiled by W. H. Thies, Extension Horticulturist

CONTENTS

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

STORAGE MANAGEMENT

Good cold storage management goes beyond the maintenance of suitable temperatures alone. One of the frequently neglected operations in commercial storages is the maintenance of a high relative humidity.

Apples are about 85% water and the intercellular spaces within the fruit may be assumed to be saturated with water vapor at any given temperature. Consequently, apples will lose moisture whenever the surrounding atmosphere has a relative humidity below 100%. At any given temperature, the lower the relative humidity the faster the rate of moisture loss by the fruit.

When apples lose about 5% of their weight as water vapor, visible shriveling is apt to occur. It would seem that the simplest thing to do to reduce losses would be to maintain a relative humidity of 100%. However, it is difficult to do so at 32° F. Even if it were possible, it is undesirable since a saturated atmosphere is ideal for mold and fungus growth on boxes, walls, and fruit. A musty odor may develop and be absorbed by the fruit and readily tasted by the consumer. A relative humidity of 85 to 90% is considered most desirable.

Chief Factors Which Tend to Lower the Humidity. (1) Dry Boxes. It has been shown that a bone-dry field crate may absorb up to one pound of water in a cold storage. When there are 10,000 dry boxes in a room they may absorb enough water to be equivalent in weight to 250 bushels of apples. Unless water is added to the room the moisture absorbed by the boxes will come largely from the apples. We have had a dry harvesting season. Many boxes were very dry when they went into storage. Don't hesitate to soak them down with a hose even after they are in storage. (2) Cold Coils. The lower the temperature of the refrigerant in the coils the greater the amount of water vapor which will condense on them as frost. When the fruit has been cooled to the desired point and outdoor temperatures are cooler, raise the refrigerant temperature if possible.

Maintenance of Suitable Relative Humidities. When the relative humidity is below 85% there are several ways in which it can be raised. Some operators atomize water into the air by the use of commercial humidifiers or home made outfits. When one considers the quantities of water which can be absorbed by dry boxes it is obvious that these units must deliver large quantities of water vapor to be effective.

The boxes and floors may be wet down periodically with a hose. If one adds no water to the room until it is filled to capacity this method is probably not nearly as effective as it would be if it is done each day as the fruit is moving into the room because one just can't get the water quickly to all parts of the room once it is full.

How to Measure Relative Humidity. The instruments available for measuring relative humidity are numerous. Frequently those types which can be read directly, such as hair hygrometers, are popular because they can be read as easily as a thermometer. However, they are not consistently as accurate as a sling psychrometer which we recommend for this purpose. If any substitute is used it should be checked frequently with a sling psychrometer. A sling psychrometer consists of two thermometers fastened to a wooden or metal backing so that they may be twirled on a handle. The bulb of one thermometer is enclosed in a cloth wick which is moistened (wet bulb) while the other remains uncovered and dry (dry bulb). As the thermometers are twirled (air movement over the wet bulb is necessary) water evaporates from the wet bulb and since evaporation is a cooling process the temperature of the wet bulb is reduced as compared to the dry bulb except when the relative humidity is 100%.

The lower the relative humidity the greater the rate of evaporation and temperature lowering of the wet bulb. Hence, by noting the temperature difference between the wet and dry bulb thermometers the relative humidity can be determined from suitable tables. The tables may be obtained from the U. S. Weather Bureau or in limited mimeographed form from the Department of Pomology, University of Massachusetts, Amherst, Massachusetts. Information concerning places where sling psychrometers may be purchased may be obtained from the Department of Pomology, also.

-- F. W. Southwick

* *

McINTOSH STRAINS

Are there superior strains of McIntosh? The answer to this question is one in which every fruit grower is vitally interested.

In 1940 the Pomology Department initiated a project to determine whether or not there are superior strains of McIntosh. An orchard composed of seven selections of McIntosh strains was planted in 1942. The strains used in the experiment were Rogers and Greening McIntosh, two red or blush types which are offered by the nursery trade. The other strains were obtained from growers or experiment stations and were designated by number. Strains 1, 8, 12 and 45 were reported to be of the blush type. Strain 39 was a striped type which was included for comparison.

We hope the experiment will find the answers to some of these questions. Are there differences in yield, amount of red color, type of red color "blush or striped," preharvest crop, storage life, and quality among the different strains? Other points to look for will include tree vigor, differences in size and shape of fruit, and whether or not the color type is maintained.

This was the first season that the orchard has produced enough fruit to make observations of the different strains. However, the crop was so small (4 to 8 bushels for each strain) that amount and type of red color were the only points of comparison made. The following table summarizes the findings of this year's observations.

Strain	Percent of apples with 20% or more red color	Percent of apples blush type	Percent of apples striped type
Rogers	92	100	0
1	85	95	5
8	84	97	3
Greening	82	99	1
12	77	36	64
45	74	93	7
39	67	0	100

From the table it can readily be seen that there are differences in amount and type of red color. The Rogers strain stands out as being the most highly colored and it does not produce any striped apples. There are probably no significant differences among strains 1, 8, and Greening in amount and kind of color. Strain 12, which originated in British Columbia, was reported to be a blush type, yet nearly two-thirds of this year's crop was striped. Whether this condition continues with future crops remains to be seen. It may be possible that some strains are not stable and revert back to the striped condition. Strain 39 per-

formed as expected. It had the poorest color and all of the apples were striped. Some notes were made as to the quality of red color and finish of the fruit. For the most part the red of Rogers and Greening was bright and attractive. The finish of the fruit was smooth. The red of strains 45, 8, and 12 had a tendency to be dull and unattractive. The finish on many apples was very rough.

Due to the size of the crop this report must be considered as preliminary. It will be interesting to see if the strains hold their same relative position in regard to amount and type of color in future years. It now appears doubtful if significant differences in other factors among the strains will be found, but it is too early to tell as yet. A few good crop years should give us the answers.

-- W. D. Weeks

* *

DEGENERATIVE DISEASE OF STRAWBERRIES

The so-called running-out or degenerative diseases of plants are caused by specific viruses. There are five known virus diseases of strawberries of which two are particularly destructive, namely, Yellows and Crinkle. All such diseases of strawberries appear to be more pronounced in the far West than in other parts of the country. Yellows, or Xanthosis (the Greek word for Yellows) is the one with which we are concerned in the East. Its symptoms in Marshall and certain other Marshall-like varieties are very pronounced and unmistakable, but very faint and difficult to detect in most of the so-called eastern varieties.

As indicated in the July 10, 1947 issue of FRUIT NOTES, J. B. Demaree at the Beltsville, Maryland, Station has learned that the low vigor, unproductive condition of some of our eastern varieties is due to the presence of the Yellows virus which is either partially or almost completely masked. In Marshall, Yellows causes a decided yellowing of the leaves around the margin and between the larger veins, as well as a crinkling, curling, and upward cupping of the leaflets, and a marked dwarfing of the leaf petioles and blades. In addition, there is a premature reddening or fall color of the older, outer leaves, and a pronounced suppression of runner formation.

During the past six years, Demaree has grafted runners of suspected plants representing many varieties from mid-western and eastern states onto runners of healthy Marshall plants. If the suspected plants carried the Yellows virus, typical pronounced symptoms would develop in the Marshall plants. Using this method of indexing plants, Demaree has been able to detect Yellows in many of the varieties commonly grown in New England. In fact, samples of Howard 17 and Robinson plants sent to Demaree in the spring of 1948 from one of our nurseries proved positive for Yellows this fall when grafted onto Marshall. A second lot of Howard 17 from another nursery proved to be virus-free. Strawberry Yellows is likely to spread rapidly wherever the common strawberry aphid, Capitophorus fragaefoli abounds. The most outstanding symptom of Yellows in varieties commonly grown here is a slight to moderate dwarfing of plants with varying degrees of suppression of runner formation.

In his most recent report on Strawberry Yellows, in The Plant Dis. Rptr. (U.S.D.A.) 32:10:428-432, 1948, Demaree implies that much of the unproductiveness of strawberries in the East might be due to the presence of the Yellows virus, that is, where growing conditions are otherwise favorable. He offers two methods for remedying the virus problem:

"Two methods are available for remedying, or perhaps eliminating, the strawberry-virus-disease problem in eastern United States. First, a temporary or stopgap method for immediate adoption by extension workers consists simply in the recommendation to growers to use for setting new fields only vigorous plants making

runners freely, having large, green, smooth leaves with upright petioles, and taken only from fields known to have been productive. Second, a slower but a more positive method for providing growers with better stock is that of indexing the more desirable varieties with Marshall or some other good indicator variety. Plants thus proved to be free of virus must be propagated under surveillance in a vector-free area for replacement of planting stock now being used. The indexing of varieties and maintenance of clean stock can probably best be done by State Experiment Station Workers. Since each State grows comparatively few varieties, it will be a small task to index those few sorts best adapted for growing in that particular State. When a sufficient quantity of clean stock has been propagated from the indexed varieties, a portion may be distributed to plant growers for mass production under State regulations assuring maintenance of clean stock."

Such a system of maintaining virus-free stock would be similar to the method of producing virus-free foundation stock of seed potatoes in isolated sections where the insect vector for the virus does not abound.

-- O. C. Boyd

* *

IMPROVEMENT OF THE WILD LOWBUSH BLUEBERRY

The harvesting and marketing of lowbush blueberries has become an industry of some importance in the State. Although information concerning the size and value of this industry for the State as a whole is not available, a limited survey made in the towns of Granville and Blandford in Hampden County revealed that there are nearly 1500 acres of blueberry lots in these towns and the annual value of the crop is about $100,000.

Naturally, the lowbush blueberry grows on soils which are low in fertility, and often dry, where competition from other vegetation is at a minimum. Under such conditions growth and yields are necessarily limited. It would seem, therefore, that where moisture is not the limiting factor, growth and yield could be improved by the use of fertilizers. This has been tried with the usual result that competing vegetation was stimulated to the point where the blueberry, in spite of increased growth, could no longer compete and was lost in a mass of its more vigorous neighbors.

In addition to fertilizer and weed problems, the growers are faced with outbreaks of disease and insect attack. During the past summer a serious outbreak of the blueberry flea beetle occurred in the Granville-Blandford area. This problem was vigorously attacked by members of the Entomology Department. They found that DDT and Parathion are very effective in controlling this beetle. Work is underway to determine its full life history so that more effective control measures may be developed.

The growers of lowbush blueberries realize that they have several problems and have requested that something be done about them. Consequently, a Station project for the improvement of the lowbush blueberry has been started. This project will be broad enough to cover all phases of lowbush blueberry culture and as new problems develop they will be attacked as far as personnel and funds will permit.

The problem of weed control must be solved before an effective fertilizer program can be developed. A recent weed survey in Granville and Blandford revealed that about 40 kinds of weeds occur with some frequency and that eight of these, bayberry, sweet fern, American aspen, meadow sweet, common brake, chokeberry,

sheep laurel, and trailing dewberry, are serious and should receive first attention. Next spring trial plots will be established in the blueberry fields where several materials and methods will be tested for their effectiveness in killing these weeds.

-- J. S. Bailey

* *

EVALUATION OF PEAR VARIETIES

The University pear orchard contains forty named varieties of pears. These trees are maintained to provide material for student instruction and, in the case of newer varieties, to enable the Pomology Department to determine their relative value.

The combined opinions of observers in the University orchards and those of pomologists in other sections of the country are presented herewith for some of the less common varieties.

Berger: Attractive, large size, equal to or better than Bartlett in quality.

Cayuga: Similar to Seckel in color and flavor, but larger in size. Appears to be blight resistant.

Conference: Similar to Bartlett in appearance, but inferior to Bartlett in quality.

Ewart: Good size, fine texture, melting, good quality. Resistant to blight.

Gorham: Similar to Bartlett in size, and quality, but ripens two to three weeks later. It is considered a good variety for canning.

Ovid: Good quality, late keeper, blight resistant.

Phelps: Relatively unattractive (due principally to its rough surface), medium size, juicy, somewhat tart in flavor, a late keeper.

Poultney: Bartlett type but not as attractive in color, mediocre quality, ripens four weeks later than Bartlett.

Waite: Resembles Bartlett in shape, attractive, medium size, mediocre quality; produces very little if any pollen so that cross pollination is essential for a crop.

Willard: Large, green color, rough, irregular in shape, inferior quality, late keeper.

In addition to the named varieties in the University orchard, there are also twenty seedlings sent here for trial by the U. S. Department of Agriculture. These sorts have not borne a sufficient quantity of fruit as yet to furnish a measure of their characteristics.

-- C. E. Roberts

* *

REPORT ON INSPECTION OF NURSERY STOCK FOR "TRUENESS TO NAME" DURING 1948

The 1948 nursery inspection trips covered essentially the same territory as last year with the exception of Iowa and Missouri.

Travel distance to these two states suggests a biennial rather than an annual inspection. Two new concerns, one in Ohio and one in Pennsylvania were added to the list of nurseries inspected, making a total of 28 for 1948. In general, the amount of stock inspected was materially less than last year in most nurseries, due to retrenchment by most fruit nurseries and adverse weather conditions which reduced many stands of stock. The number of misnamed trees found was smaller than usual.

No systematic inspection work was done on peaches in 1948 nor is any planned for the near future.

-- A. P. French

* *

FIRE PREVENTION

Fire not only claims thousands of lives every year, but fire-caused destruction threatens a loss of three-quarters of a billion dollars in 1948 alone. Of all the catastrophes which afflict mankind, fire is perhaps least deserving of the term "accident." We cannot prevent earthquakes, torrential rains, or hurricanes.

But most fires are preventable. Man, not Nature, is careless in disposing of a match or a cigarette. Man, not Nature, thoughtlessly piles up inflammable materials in basements or attics and permits the development of other fire hazards. Since the best defense against fire is alertness, everyone is urged to make a special effort to remove fire hazards and to build up habits of fire prevention.

In fulfilling our responsibility to assist in every feasible way in making the public aware of the great need for fire-prevention activities," I urge every agency of the Department to support the program of fire prevention", says Charles F. Brannan, Secretary of Agriculture. "Let us cooperate completely with farm organizations, local fire departments, and other agencies to curb fire losses. Let those who have contact with farm people stress the importance of eliminating fire hazards from farm buildings and communities. Let us all, as good citizens, find and eliminate such fire hazards as may exist in and about our own homes.

"Most fires are man-made. Therefore, most fires are preventable. Let us prevent them -- by being alert -- active -- cooperative."

* *

DO YOU KNOW

That the waste from pear canning plants is suitable for growing high protein, high vitamin yeast for use in poultry feed? One half of the hundred thousand tons of pear waste available annually could be made to produce 1,500 tons of concentrated feed worth $250,000.

That apples in Yakima and Wenatchee, Washington are much smaller this year than normally? In contrast to the large sizes of past seasons, many Delicious are in the medium size class. With the Delicious crop about 15% and Jonathon 20% below estimates, the Washington total is certain to shrink below the five year average.

That local or nearby apple receipts in Boston for September are 38% larger than the five year average? Few apples were shipped in, yet the total (nearby and shipped in) was 10% greater than the five year average, indicating a very favorable situation in the Boston apple market.

That the term "weed" applies not to a particular plant, but to a plant in relation to its environment? Under one set of conditions a plant may be highly beneficial and under other conditions, thoroughly obnoxious. Definitions include (1) a plant out of place, (2) any injurious, troublesome or unsightly plant, (3) a plant which interferes with the growth of the crop to which the field is temporarily devoted, etc. Any of the fruit plants might under certain conditions be classified as weeds.

That the American oil industry had its beginning in 1859 when the first oil well was drilled at Titusville, Pa.? The 1948 U. S. production will amount to more than two billion barrels or 630 gallons for every person. Oil in various forms is an essential material on the fruit farm aside from its use as an insecticide. Imagine a farm without lubricants, fuel oil or gasoline!

That about 60% of the pruning and thinning in peach orchards in Mesa County, Colorado, is done by workers walking on stilts? The practice began about 1904. (From King Apple and Queen Peach, Illinois, September, 1948).

That a bone dry apple box may absorb as much as one pound of water from the contents or from the surrounding air in storage? When an apple loses about 5% of its weight as water vapor, visible shrivelling begins.

That 90% of all farm fires are preventable? Farm fires cost $100,000,000 last year, killed 3,500 farm people, and injured thousands. Eliminate all your Fire Traps.

* *

TESTING STRAWBERRY VARIETIES

Plans are under way for the establishment of a strawberry variety testing project which will help to determine the behavior of promising varieties in different parts of the State. It is a well known fact that strawberries are quite sensitive to soil and climatic conditions. A variety which produces well in Amherst may be poorly adapted to growing conditions on Cape Cod. By using a variety such as Howard 17 or Catskill as a yardstick and growing other varieties along side, a direct comparison may be made. The above mentioned project is designed to compare at least five promising varieties in at least five different counties in Massachusetts. Fifty plants of each variety will be distributed among carefully selected cooperators. These growers will give the plants the same care as is given their own plantings, and yield records will be kept. In this way additional information concerning strawberry varieties in relation to soil type and climatic conditions will be obtained.

* *

RED APPLE CLUB MEMBERS TO BE ANNOUNCED SOON. Membership in the Red Apple Club will exceed that of 1947. Thus far about 25 growers have qualified for admission to this honorary fraternity. It is interesting to note that in at least three orchards a 5-bushel sample of apples was thoroughly inspected without finding a single scab spot, in spite of a very rainy May and June.

* *

Fruit Notes

NOVEMBER 30, 1948

Prepared by the Departments of Pomology, Entomology, and Botany, and
Other Staff Members
Compiled by W. H. Thies, Extension Horticulturist

Contents

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

WHY IS CROSS POLLINATION NECESSARY?

This question is often asked by inquisitive fruit growers as well as students. It can be briefly answered by stating that the constitution of some fruit plants is such as to make self-fertilization impossible. Some varieties of apple such as Gravenstein produce only a very small amount of viable pollen. This is because such varieties have an uneven number of chromosomes in their cells. As a result, when cell division takes place during the formation of pollen, many pollen grains fail to receive their full quota of chromosomes. Consequently, those pollen grains do not mature properly and the result is many abortive pollen grains, which fail to germinate similarly as do the shrivelled seeds one sometimes finds in an apple. Naturally, one would not choose such a variety as a pollenizer for itself or any other variety.

However, another condition known as self-incompatibility exists in most of our apple, pear, plum and sweet cherry varieties. In this case the varieties have an even number of chromosomes. Each pollen grain receives its normal quota of half of them and develops into a good plump grain which will germinate and grow. However, it will germinate and grow only in the blossom of another variety,-- not in a blossom of its own variety -- because it carries a genetic factor which inhibits the growth of the pollen tube down through a pistil of like genetic make-up. In this case, like repels like, so very little, if any, fruit is produced unless a good pollenizer is nearby.

In the case of sweet cherries there are many varieties which not only are self-incompatible, but also cross incompatible with several other varieties. Fortunately, this is not a common situation in apples. On the other hand, most peach and some cherry varieties will set fruit by themselves because nature did not endow them with this peculiar type of heredity.

Self-incompatibility is not peculiar to fruit plants. As a matter of fact it is found also in several vegetables, flowers, and other crops. It may be of interest to note that the first case of it was discovered in the wild mullen nearly two hundred years ago by a botanist who was not at all interested in helping fruit growers to get a better set in seasons such as the past spring.

-- A. P. French

* *

SOIL ACIDITY: ITS CAUSES, EFFECTS AND CURES

Soils naturally contain either insoluble clay or humic acids. In most productive soils these soil acids are combined with bases such as lime, magnesia and potash. Soils become progressively more acid and less productive as these bases are lost from the soil by leaching or by having been absorbed by the crops. Many agricultural practices speed up the losses of these bases. In orchard soils, dusting sulfur and nitrogen fertilizers are particularly effective in increasing the losses of these bases because the sulfur produces sulfuric acid and nitrogen fertilizers produce nitric acid in the soils. Both of these strong acids increase the solubility of the bases in the soil water and cause their more rapid loss as a result of leaching or cropping.

There are several direct effects on the productivity of soils which result from the loss of bases. Calcium, magnesium and potassium become limiting factors in plant growth because of their relative scarcity rather than from the inability of plants to secure either of these elements from the acid soil. Calcium, magnesium and potassium are known to be quite available for absorption by plants when they are present in acid soils. Plants have a tendency to absorb a constant total

amount of these bases and therefore these bases must be present in the soil in proportions that will result in the plant absorbing the most desirable amount of each. In acid soils where all of these bases are low the addition of any one of the bases separately as a fertilizer may actually cause a decrease in the absorption of the others by the plant and the net effect will be a decrease in yield rather than the expected increase. Another direct effect of soil acidity is that some plants are actually sensitive to the acidity itself. Obviously this effect can be corrected only by reducing the acidity.

Several other effects result from soils becoming extremely acid. Some of these effects are chemical and others are biological. The chemical effects are usually those associated with increased solubility of elements which are toxic to the plant when present in too high concentration in the soil solution. Iron, aluminum, and manganese become more soluble when the acidity is increased and cause a depression of plant growth because of their excessive availability. In addition, iron and aluminum react with phosphates in more acid soils to form insoluble compounds and thus indirectly affect the phosphate nutrition of the plant by making this essential substance less available.

The undesirable biological effects that result from extreme acidic condition of the soil are associated with both the acidity and the chemical behavior of the elements needed for the nutrition of the soil microorganisms. The more desirable bacteria are replaced by fungi which produce substances which are toxic to plants. The beneficial legume bacteria will not grow and fix nitrogen and the series of bacteria which cooperate to convert organic matter to available nitrates are slowed down in their activity. Many other soil microorganisms that grow well and produce desirable substances in neutral soils are limited in their activity in extremely acid soils.

Before the orchardist uses fertilizer to increase productivity, it is necessary that he correct the acidity of extremely acid soils with dolomitic limestone or other neutralizing materials. The fertilizer can then perform its functions without being limited by the factors resulting from extreme acid conditions in the soil.

In summary, neutralizing excessive soil acidity brings about the following:

1. Increased supply of available calcium - calcium and magnesium, if dolomitic limestone is used.

2. Increased availability of phosphates.

3. Decrease of essential elements which are toxic if present in too high concentration such as iron and manganese.

4. Decrease of toxic non-essentials such as aluminum and certain organic toxins.

5. Substitution of beneficial bacteria for the less desirable fungi.

-- Dale H. Sieling

* *

LOOKING BACKWARD

Don't look backward. The past is past. Forget it. Look to the future. Good advice under some circumstances. But should we forget old friends who have served us faithfully and long?

Among the peach varieties of 25 years ago were several which could be called true and trusty old friends. What has happened to them?

The commercial list was short: Greensboro, Carmen, Champion, Belle of Georgia, Elberta, J. H. Hale. Greensboro is a white fleshed peach ripening in early August. It is one of the hardiest in bud. Earliness, bud hardiness, productiveness and soil adaptability are its chief assets. Its quality is poor and it has a tendency to cling. Because of its earliness it made money for those who grew it. It has been almost entirely replaced by yellow varieties of higher quality such as Marigold.

Carmen is another productive, white fleshed variety ripening 10 days to two weeks after Greensboro. It is not qquite so hardy as Greensboro but hardier than the yellow varieties then grown. It was very popular 25 years ago, in fact, was considered one of the best varieties of its day. It has been replaced almost entirely by such yellow, high quality varieties as Golden Jubilee and Triogem.

Champion is one of the finest flavored peaches ever grown. Its rich, soft, juicy flesh is a delight to the palate. However, its soft, white flesh gives an unattractive canned product. It is quite hardy in bud but too soft fleshed for good handling and is very subject to brown rot. It has almost entirely disappeared and is being replaced by Summercrest.

Belle of Georgia, another high quality, white fleshed variety, is productive and quite bud hardy. Its ripening season is just ahead of Elberta with which it often had to compete and, therefore, was at a disadvantage because of its white flesh. Very few are grown today. It has been replaced by yellow varieties of the Elberta type.

In general, there is little demand for white-fleshed peaches so that in most cases they are being replaced by yellow-fleshed sorts.

Elberta and J. H. Hale are still being grown and will be discussed later.

-- J. S. Bailey

* *

CAN YOU TOP THIS PIE? At the recent Kentucky State Fair, as an added attraction in the Fruit Department, a five-foot apple pie (made with frozen apples) brought people to the apple end of the exhibit hall. A Louisville concern baked the pie in their large oven. Pie and tin weighed 390 pounds. Governor Earle Clements of Kentucky cut the pie in a special ceremony and about 125 servings were given out. The remainder was served to the public free - first come, first served, using 1,000 six-inch paper plates. So, if you have 1,000 guests to serve, a five-foot apple pie, six inches thick will do the trick. The five-foot pie pan is the property of the Kentucky State Horticultural Society.

H. D. Armstrong, Secretary-Treasurer of the Am. Pom. Soc. says "Until we hear to the contrary, we are calling this the WORLD'S LARGEST APPLE PIE. If you can beat it, let us know and we will haul down our flag."

WHAT, NO APPLES??

The best ways to sell apples is to display Fancy apples. That has been said so many times it sounds worn and threadbare, but it's just as true as the first time it was said.

I have observed the reactions of various groups to displays of good apples. At many fairs and Horticultural shows there have been displays of numerous varieties of apples, both old and new, banks of apples, and designs of apples. People stand and look, recalling the apples of their youth and how fine they tasted. How often they remark, "If I could only buy apples like those at the store."

Apples are often passed around to groups which come to the campus of the University for various meetings. Naturally, we give them the best. And how many times I have heard people say, "Oh! If I could only get apples like those at the store."

Good apples whet the appetite for apples. In fact, they whet the appetite to the point where apples often disappear from displays. Yet, in spite of such evidence there were no apples on display at the recent Horticultural Show at Horticultural Hall in Boston. Here a real opportunity to advertise apples was missed. Isn't there some organization of growers with sufficient interest in the apple industry to arrange such an exhibit? What, no apples?

-- J. S. Bailey

* *

MULCHING THE STRAWBERRY BED

As soon as cool November weather has checked growth and hardened off strawberry plants, a mulch for winter protection about three inches thick should be applied. It prevents heaving of plants caused by freezing and thawing, prevents crown injury, delays spring growth until more favorable weather, and avoids winter drying of plants. During the fruiting season, the mulch conserves soil moisture, discourages weeds, keeps fruit clean, and pickers prefer it to bare soil.

Experience suggests a mulch which does not mat down so closely that plants are smothered, remains where placed; which is also cheap, free from troublesome weed seeds, - and easily applied.

Where obtainable, marsh hay or swale grass is as good as straw and cheaper. Seaweed has proved practical for local use. On Cape Cod pine needles have been used, but the supply is limited, the mulch rather too compact. Baled straw may cost more but is a good mulch and frequently used, provided any smothering chaff is discarded. Growing rye, oats or millet especially for mulching is practical, if these crops are cut before their seeds mature.

-- O. G. Anderson

* *

CHEMICAL THINNING OF APPLES

Results obtained in 1948. The work in 1948 consisted of testing two dinitro materials (Elgetol and a dinitro powder, DN #1) and the sodium salt of naphthalene acetic acid (App-L-Set). As you all appreciate, the pollination weather this spring was not conducive to a heavy set. Consequently, thinning was not generally much of a problem this year in some sections of the state except where biennial bearing varieties of good vigor blossomed heavily and were interplanted with many good cross-pollinating varieties.

Some of our results and observations may be tabulated as follows:

1. Of the blossom thinning materials, the dinitro powder DN #1 is an effective material and much less injurious to apple foliage than Elgetol. A wet, cool spring is conducive to severe foliage "burn" from Elgetol. Elgetol appears to be on the way out as a thinning material for apples.

2. The hormone material, App-L-Set, seems much more likely to cause permanent leaf injury and dwarfing when applied near bloom or early calyx than it does at late calyx or 2 to 4 weeks after calyx. This seems to be true even though heavier concentrations are put on later.

3. It appears that apples can be thinned up to 4 weeks from calyx with hormone. The concentration, however, must be increased markedly as one gets further away from calyx. Also, some of the benefits in size and annual blooming of some varieties may be lost the later one delays putting on the material but the chances of over thinning may be considerably reduced. It is considerably easier to forecast the set 2 weeks after calyx than it is at calyx.

4. A tree which is not excessively thinned by chemicals at blossom time or calyx may outyield and produce fruit of larger size than a tree thinned to the same degree by hand a month later.

5. From measurements of bud size it appears that the hormone type materials thin off a larger proportion of flowers and young fruits from the less vigorous flowering spurs than they do from the vigorous ones. This means that the greatest thinning is apt to take place on the inside and lower shaded limbs than it will on the outer, better exposed places on the tree which generally produce the more vigorous spurs.

6. From data obtained by counting all flowers and young fruits falling from the trees, up to and including the June drop, that have been sprayed with a hormone type material at calyx and up to 4 weeks later, it appears that the drop is delayed for a few days shortly after the material is applied. After this short period of delay the rate of drop is markedly accentuated so that total drops exceed that occurring on unsprayed trees. Apparently the hormone "sticks" them on for a short while before the opposite effect takes place.

The following data were taken from some Early McIntosh trees, nearly identical in size, where a commercial job of chemical thinning was done.

Treatment	Av. Sizes, in bushels per tree			Av. Total Yield per tree
	Under 2¼"	2¼ - 2½"	2 3/4" up	
Check Hand thinned.	3.0	5.6	0.0	8.6
DN #1 - 1 lb./100 gals. Applied at full bloom	0.5	5.7	4.5	10.7
App-L-Set - 8 oz./100 gals. Applied at early calyx	0.0	1.8	4.8	6.6

-- F. W. Southwick and W. D. Weeks

* *

Four Times Up
Four Times Down

Four Times since 1775 -- after the Revolutionary War, the War of 1812, the Civil War, and World War I -- this country has had four major inflations. Prices doubled or trebled in each instance. And four times these prices came tumbling down again -- with farmers at the bottom of the crash. Will there be a fifth crash after our present inflation??? Some say "yes," others say "no." Our suggestion is, "play it safe." Buy U. S. Government Savings Bonds. Read the enclosed circular as to which bonds to buy, where to buy, and why. Just remember what happened before. Don't let it happen again.

-- R. H. Bunn

* *

PRODUCTION OF MCINTOSH ON MALLING STOCKS

The search for a rootstock which will produce a smaller McIntosh tree has been going on several years. We hope to find a stock which will produce a tree that starts production early which will never get too large and at the same time give us the same yield per acre as a larger tree. A tree which could always be picked with an eighteen foot ladder would be much easier to spray and pick.

Yield records from our experimental plantings of McIntosh on Malling rootstocks indicate that our search for a rootstock which produces a smaller tree may be realized. Per acre yields from trees on Malling I and II compare favorably with those on the more vigorous and larger trees produced by stock XVI. Trees on this stock will be nearly as large as trees on seedling roots.

There structures house unattended motors or diesel engines, some provision should be made to prevent fires starting in the engine or compressor rooms from spreading to other parts of the structure. Walls of masonry, preferably plastered with a Portland cement plaster, together with a metal or other type of roof which keeps the fire confined until the fire apparatus arrives, is most helpful.

Protective devices can usually be installed easily and cheaply. If the value of the machinery or other equipment warrants, one or more underwriters-approved extinguishers should be immediately available. Carbon dioxide and carbon tetrachloride are commonly used to extinguish fires in such places.

Lightning protective systems are recommended for isolated farm structures particularly those located on high or elevated ground. These protective systems eventually pay for themselves in reduced rates and in reduced losses.

One or more hose connections and sufficient hose to reach all portions of the structure is an invaluable asset, should the fire be discovered before reaching large proportions. Sprinkler systems may be used in rooms, whether above or below freezing temperatures. A fog or spray may be used advantageously to cool fires, particularly when confined to small rooms such as are found in a dwelling.

-- W. C. Harrington

* *

FACTORS INFLUENCING ATTRACTIVENESS OF FRUIT BLOSSOMS TO HONEYBEES

It is a fairly common experience for a fruit grower to note that certain trees or varieties of trees are seemingly neglected by honeybees during bloom. Among the factors that determine the attractiveness of blossoms to bees are the following: (1) amount and sugar concentration of nectar, (2) amount of pollen available, (3) amount of bloom, the greater the amount, the more attractive it seems; (4) condition of bloom.

The fact that bees can detect differences in sugar concentration has been recently proven. While insufficient tests have been conducted, it is evident that a variation of 20-30% sugar may occur between two varieties. Even greater variation in sugar concentration is present between different species of plants, as for example apples and pears. Further studies of the sugar concentrations of nectars are advisable. It is possible that such studies might influence the planting of certain varieties in order to improve pollination.

It is evident that from the standpoint of pollen, bees will collect this where it is most abundant. Therefore, vigorous trees with comparatively large amounts of bloom would be more attractive to bees provided that the development of the blossoms was at the same stage.

As far as the condition of bloom is concerned, it is generally considered that a tree in full bloom is more attractive than one either at an earlier or later stage of development. There are some exceptions to this, apparently. Mr. George Rea, former extension Apiculturist at Cornell, is authority for the statement that at times, nectar secretion in McIntosh is at its height about the time of petal fall.

While this discussion has presented some of the explanations for the apparent preference of bees for certain varieties or species of fruit trees, it should not be forgotten that some plants in bloom at about the same time as fruit may be more attractive to the bees. If this is the case, it would seem that some action might be taken to reduce the abundance of plants if the bees prefer them to fruit bloom.

-- F. R. Shaw

The average yield per acre of McIntosh on Malling I over the last five-year period from an orchard set in 1920 was 350 bushels, and for McIntosh on Malling XVI, 355 bushels. The per acre yields were calculated on the basis of 35 trees per acre for the smaller trees on Malling I, and 24 trees per acre for trees on Malling XVI.

In a much younger block of trees which fruited for the first time, season yield records indicate that trees on Malling II will produce as well as those on Malling I or XVI. Yields from trees on the more dwarfing stocks such as III, IV and V were considerably lighter. Some of these stocks have been discarded for reasons other than light cropping. Yields from trees on Malling XII and XV were disappointingly low. These stocks will produce a tree nearly as large as seedling roots.

Due to the long life span of apple trees, work with rootstocks is of necessity a long, slow process, but progress is being made. We can now definitely eliminate many of the Malling rootstocks as being undesirable for one reason or another. For the grower who desires a medium sized tree which can be more easily sprayed and picked, Malling stocks I and II appear to be the best bet at the present time.

-- M. D. Weeks

* *

An essential has been defined as something we can't do without, but do; an unessential as something we can do without, but don't.

* *

FIRE PREVENTION ON A FRUIT FARM

Among the many evils of inflation is one generally given little attention but which may, and often does, assume large proportions. This is the low amount of insurance generally carried on farm structures constructed at a time when the purchasing value of the building dollar was comparatively high. With building costs at least twice what they were ten years ago, it behooves a farmer to study his insurance policies carefully with a view to increasing the insured values so that they are commensurate with present day or replacement costs.

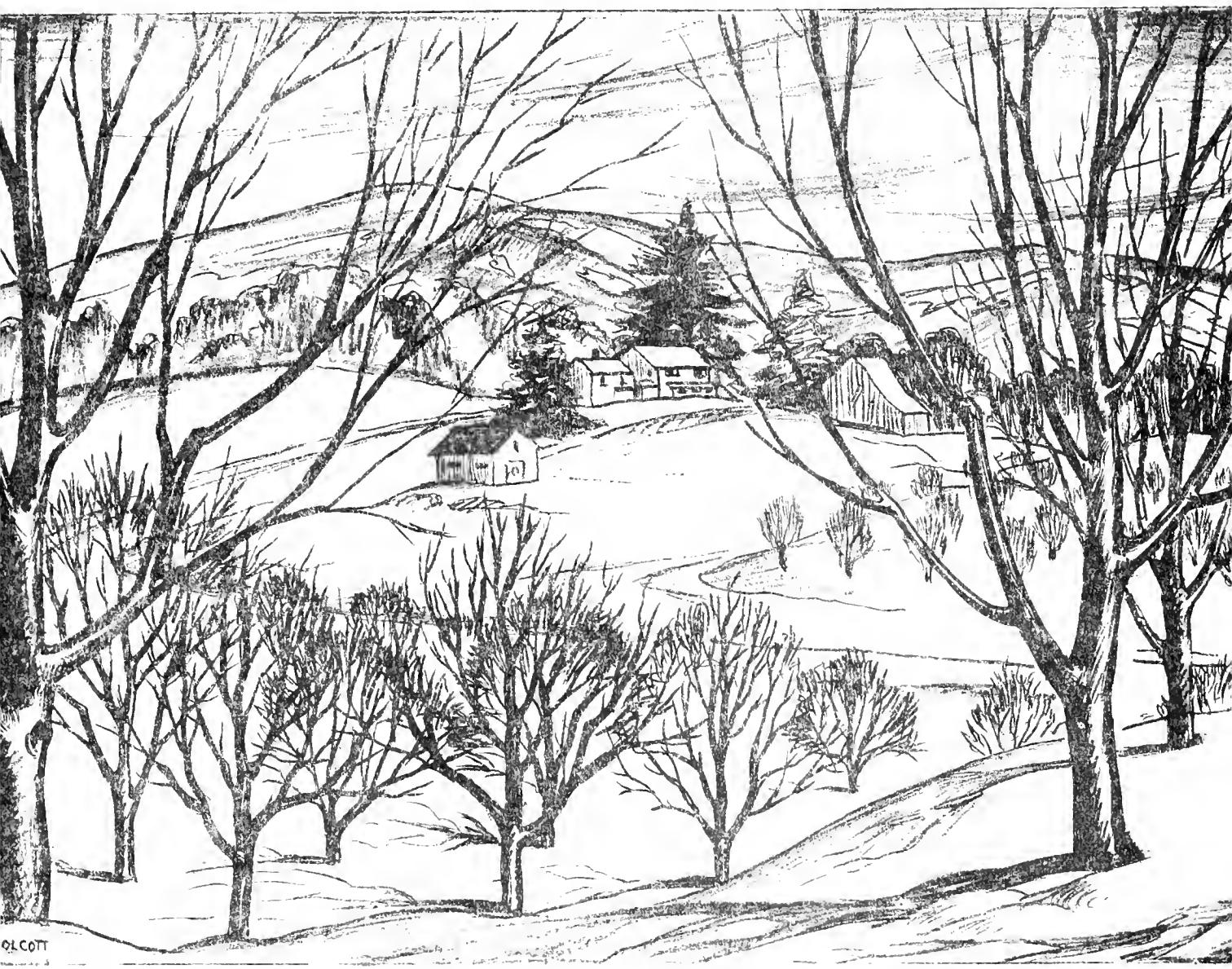
At the same time he should give some thought to the fire hazards on his premises and take immediate steps either to reduce the hazards, eliminate them entirely, or install protective devices. Some farmers have developed a false sense of security by insuring their buildings for all and perhaps more than they were worth, only to learn later that they were completely out of business with attendant or consequential losses nearly as large as the buildings lost by fire.

Few farmers have "No Smoking" signs conspicuously posted in their buildings and many smoke in buildings where shavings, hay, straw, and other forms of litter are strewn over the floors, and even in rooms where fuel and lubricating oils are stored. These forms of carelessness are not tolerated by careful farm owners.

Some kinds of electric wiring have a habit of depreciating rapidly where moisture is present. The only remedy for a wiring system that has deteriorated is replacement. Open wiring (knob and tube) protected from mechanical injury is one of the safest and most durable types of wiring.

Fruit Notes

DECEMBER 30, 1948



Prepared by the Departments of Pomology, Entomology, and Botany, and
Other Staff Members
Compiled by W. H. Thies, Extension Horticulturist

CONTENTS

Issued by the Extension Service in furtherance of Acts of May 8 and June 30, 1914, Willard A. Munson, Director, University of Massachusetta, United States Department of Agriculture and County Extension Services Cooperating.

ARE INSECT PESTS INCREASING OR JUST HARDER TO CONTROL?

The answer to both questions is "Yes". And we wish it were possible to stop right there. But someone always asks, "Why?". So here we go.

Yes, insect pests are increasing in two ways. First, there are now more kinds of insects in the country which do damage to crops. And secondly, there are, at least in some years, more individuals of one kind or another to cause trouble.

The first type of increase has resulted mainly from the accidental introduction of foreign species. Many of these introduced forms have not become pests, but too often they have. And when they do become pests it is usually with a vengeance since their natural checks, or enemies, have been left behind. In many cases, also, these displaced insects find a far more abundant food supply in their adopted home.

Then, too, there are native insects that have become pests as a result of conditions being made more favorable for them. For example, the Codling Moth and the Colorado Potato Beetle were not pests previous to the planting of large acreages of their favored food plants. This situation has allowed for the development of pests of economic importance from some of our native species. Sometimes rather simple changes in agricultural practices may bring about conditions which make a serious problem out of an insect already there, but of no concern. For example, in many of our orchards nowadays, we don't let the hogs eat the drops as fast as they fall -- nor do we have any substitute practice.

Although very hard to prove, there is some evidence that certain spray or dust materials may act in a way that allows an otherwise unimportant insect or related form, suddenly to become a destructive pest. The interrelationship of the use of DDT and the appearance of the Two-spotted Mite in orchards may be one such case. It is stated that in the State of Washington the use of DDT has resulted in the wooly aphid becoming a pest of major concern.

And now for that second type of increase -- the greater numbers of individuals of a certain species.

Usually there is a fluctuation in the abundance of a species from season to season, from orchard to orchard or from one series of years as compared to another. Although you may not think it true next July and August, the Japanese Beetle cannot possibly be as numerous throughout the infested area next summer because of the drought this past season. Eggs could not hatch nor young grubs become established in normal numbers.

On the other hand, the dry, hot weather favored Apple Maggot, second brood Codling Moth, Bud Moth, Aphids, and a host of others. They were more numerous or will be next year if nothing interferes with their development between now and then.

Some insects become more numerous according to a more or less definite cycle. Fall Webworm and Tent Caterpillar and probably Red-banded Leafroller are outstanding examples of this. Extremely favorable or adverse conditions, wholly apart from the normal factors governing the cycle, may on occasion cause the variation from the usual pattern.

Large acreages or block plantings of favored varieties or types of host plants nearly always result in increased populations of certain species of insect pests when other conditions are not unfavorable.

Yes, insect pests are harder to control. This is not altogether the result of changes within the insects nor to changes in control practices. It is due in part, at least, to the more critical consumer, the keen competition for markets and the pride a fruit grower takes in a crop that is 95% free of insect and disease blemishes. The fruit grower of today who continually lets insects or diseases take over 10% of his crop does not remain a successful fruit grower. Thus, in an indirect way, it is harder to control insects because of the extent to which we must control them.

Some insects are actually harder to kill, than in previous years, with standard spray materials. Lead arsenate placed in the calyx cup at the petal-fall stage year after year has led to the development of Codling Moth worms that do not bother to look for the calyx end of the apple. They just go in anywhere as "side worms". It has been shown in scientific tests that Codling Moth strains, resistant to lead arsenate, are to be found in well sprayed orchards. And now, we have developed in the laboratory and have found in nature, strains of flies more resistant to DDT.

The arrival of new pests, the development of new habits and strains which make chemicals less effective, the unknown effects which may follow the use of new chemical controls, and the seasonal fluctuations of insects make pest control an increasingly difficult problem. Is it surprising that we must spray our orchards more often and with more materials than was necessary in grandfather's day?

-- Frank R. Shaw and Ellsworth H. Wheeler

* * * * * * * * * * * * * * * * * * *

NEW PROJECT ON APPLE TREE NUTRITION

A new project on apple tree nutrition has been initiated by the departments of pomology, chemistry and agronomy. Work on the project is already underway. This spring the differential fertilizer and mulch treatments will be applied to the field plots for the first time.

Some of the objectives of the project are to find out what effect different levels of nitrogen in the tree have on its growth, yield, color and keeping quality of fruit. An attempt will be made to maintain three levels of nitrogen in the tree by soil applications of a nitrogen fertilizer, hay mulch, and a complete fertilizer, such as 7-7-7. In addition to soil tests under the various treatments, leaf samples will be collected and analyzed for nitrogen, calcium, potassium, phosphorus, and magnesium. Chemical analysis of the foliage should enable us to tell what effect different levels of nitrogen have on the intake of mineral elements into the tree in relation to their availability in the soil. We also hope to find out if soil applications of elements other than nitrogen are necessary to maintain maximum growth and yield. The ultimate goal of the project is to find out how to maintain the proper level of nitrogen and other elements in the tree which will produce a maximum crop of highly colored apples.

-- W. D. Weeks

* * * * * * * * * * * * * * * * * * *

Apple Barrel Reverie "And now the jolly farmer packs his apples up for town. This is the top row in the bar'l ----- O O O O O O, and these ----- o o o o o o, are further down."

* * * * * * * * * * * * * * * * * * *

LOOKING AROUND

Last month we took a look into the past and reminisced about some old peach varieties. This month we will take a look around at the varieties we are now growing to see how well they fit out present situation.

The earliest peach on the recommended list is Marigold, a cross of Lola x Arp and one of the earlier introductions from New Jersey. The fruit, which ripens the first week in August, is yellow fleshed, well colored, almost freestone, medium in size, and although not one of the best in flavor, it is very good for an early peach. The tree is vigorous and productive and has fruit buds which are quite cold resistant. Its chief advantages are earliness, bud hardiness, productiveness, and good flavor.

The next on the list, Oriole, is a cross of Slappy x Admiral Dewey, another of the earlier introductions from New Jersey. It ripens 3 or 4 days after Marigold. The fruit is yellow fleshed, freestone, attractive, very good in flavor, and medium in size. The tree is large, vigorous, productive and one of the hardiest in both wood and bud. The tree sets such large crops that very heavy thinning is necessary to get size. Even with heavy thinning the fruit is only medium or a little better in size. Many peach growers object to the variety for this reason. However, it does fill in a gap between Marigold and Golden Jubilee and its outstanding hardiness, productiveness and quality recommend it.

Marigold and Oriole have not been planted in large quantities and probably will not be. They are useful to extend the earliness of the season for local trade.

Golden Jubilee is an open pollinated seedling from a tree which resulted from a cross of Elberta x Greensboro. It is another of the early New Jersey introductions. It is very popular among Massachusetts growers and has been planted in considerable numbers. The fruit, which starts to ripen at the end of the Oriole season or about 4 weeks ahead of Elberta, is above medium to large in size, yellow fleshed and freestone. It develops good color and excellent flavor and is very attractive. The flesh softens too rapidly for long distance shipment but since most peaches are sold locally or at nearby markets, this is not a serious handicap. The tree is vigorous and although a bit slow in coming into bearing, it is very productive when it does start. It is more hardy in bud than Elberta but not outstandingly so. Golden Jubilee will probably continue to be a popular commercial variety.

For a number of years we searched for a good variety to fill in between Golden Jubilee and Halehaven and finally found it in Triogem. This is one of the more recent introductions from New Jersey, a cross of Hale x Marigold. The fruit is yellow fleshed, freestone, firm, very high in quality and color, very attractive and medium to large in size. The fruit colors well several days before ripe, ripens slowly and hangs to the tree well so that picking need not be rushed. The tree is medium to large in size, vigorous and very productive. It needs a good soil and good culture to obtain best performance. It sets heavily and requires plenty of thinning to get fruit of good size. In some sections it is rated as a better commercial variety than Golden Jubilee.

Halehaven is so well known that it hardly needs comment. It is rapidly becoming one of the chief commercial varieties in Massachusetts. Some consumers are beginning to recognize its value and call for it by name. It originated at the Michigan Experiment Station as a cross between J. H. Hale and South Haven. The fruit is yellow fleshed, freestone, large, well colored, attractive, firm

fleshed, and hangs to the tree well. It starts to ripen about 18 days ahead of Elberta. The tree is large, vigorous, and productive with fruit buds which are fairly cold resistant. All things considered, Halehaven will be hard to beat for its season.

Summercrest, a cross of J. H. Hale x Cumberland and one of the more recent introductions from New Jersey, has considerable merit as a variety to fill in between Halehaven and Elberta. The fruit starts to ripen a week to 10 days ahead of Elberta. It is yellow fleshed, freestone, fine flavored, large and well colored and attractive when grown under proper conditions. Unfortunately, the fruit does not hang to the tree well and must be picked as soon as it becomes firm ripe. It also softens a little too rapidly for best commercial handling. The tree is large, vigorous and productive. In fact, it is so vigorous that if planted on rather fertile soils or overstimulated by cultural treatment, it easily becomes over vegetative and produces fruit with little red color. It will probably never be in a class with Golden Jubilee, Halehaven and Elberta but has a place in the variety list until a better one is found.

Elberta has been the outstanding commercial peach of the eastern United States for many years. Its wide adaptability, productiveness, desirable commercial characteristics and wide consumer acceptance have made it popular in many sections and it will remain popular until a better variety of the same season is found. It is losing some of its popularity in Massachusetts because it ripens in McIntosh season. Most of the peaches produced in Massachusetts are grown by apple orchardists who raise peaches for diversification. Consequently, any peach variety which competes for labor with McIntosh harvest has less appeal than a variety ripening ahead of McIntosh.

J. H. Hale is another old variety which was very popular for many years but has been losing some of its popularity recently. The fruit is yellow fleshed, freestone, very large, attractive, fine flavored, and firm, an excellent commercial peach in its fruit characteristics. However, the tree is distinctly dwarfish, lacking in vigor, and shy on production. The fruit buds are quite susceptible to winter injury. Also, this is one of the few peach varieties which is self sterile and requires cross pollination. It is the tree and not the fruit characters which have lost J. H. Hale much of its former popularity. It ripens with or a little after Elberta and so it also needs attention in McIntosh season. It is undoubtedly on the way out.

-- J. S. Bailey

* *

Apples and Pears Ripen Faster Off than On the Tree. In 1947 a USDA worker compared the rate of ripening of Delicious apples and Anjou pears by keeping half of the fruit unharvested and an equal number in cheesecloth bags suspended from the same limbs. Differences in maturity of the two lots were determined periodically by means of a pressure tester and the amount of soluble pectin present. It was found that the Delicious apples ripened three times faster in the bags than on the tree and the pears in bags, four times faster. This study shows what every grower should know, that the best place to keep fruit is on the trees unless it can be placed immediately in cold storage. (From Wisconsin Horticulture)

* *

1949 Apple, Peach and Pear Spray Charts. Barring an unexpected delay, the new spray charts should be ready for distribution around the middle of February. Instead of submitting the copy to the State Printer, printing will be accomplished by means of the Veritype and Multilith machines in the Mailing Room.

* * * * * * * * * * * * * * * * * * * *

An Echo of 1912. In an old file we discover how Massachusetts farmers were advised to spray in 1912. "Facts for Farmers", Vol. II, No. 8, covers "Spraying, -- Why, When, How, With What", by F. C. Sears. And believe it or not, only four applications are mentioned as follows: (1) autumn, after leaves are off the trees, -- oil for scale; (2) early spring, -- lime sulfur for scale and fungus diseases, (3) within a week after petals fall, -- lime sulfur and lead arsenate, for scab, codling moth and curculio, and (4) three or four weeks later, same materials as third spray, for codling moth, sooty fungus, etc. The advice offered along with the spray recommendations is as good today as it was then -- (1) get ready in ample time, (2) have a repair kit along, (3) know what you are spraying for, (4) spray in time, (5) spray thoroughly and (6) have every convenience for the preparation and mixing of the spray materials. If pests were more easily controlled 26 years ago, we have reason to envy the growers of that era.

* * * * * * * * * * * * * * * * * * * *

Are Some of Your Fields "Flat Tires"? Quoting from a prominent soils specialist, "Just as many motorists neglect checking tire pressure, so have we neglected checking the fertility status of the soil. An automobile tire built to run with 32 pounds pressure should be inflated to that level. Comparing that idea to the soil, we should check our soils to determine the fertility pressure level. If the level is too low for optimum yields, sufficient nutrients should be added to bring the soil up to the proper level. We should test our soils frequently, like checking our automobile tires and add nutrients to the soil as we do air to tires. Flat soils like flat tires do not carry us very far."

Along the same line, another soils man in speaking of unproductive orchards says, "First test for acidity, and add lime, if needed, to improve the sod. Whatever fertilizers are needed for the same purpose should also be added. This may mean a higher grade of fertilizer or more of it. The important thing is to grow a heavy grass cover so that large amounts of organic matter may be added to the soil."

* * * * * * * * * * * * * * * * * * * *

Our Cover Illustration. The winter scene on our FRUIT NOTES cover is the work of a former Amherst boy, Roger Wolcott, now living in Agawam. Mr. Wolcott is spending part of his time in preparing illustrations for the Extension Service.

* * * * * * * * * * * * * * * * * * * *

SOME DORMANT SEASON JOBS ON A FRUIT FARM

Starting now a fruit grower may still have time to perform as many of the following winter jobs as his conditions require:

(1) Order sprayer and duster repair parts and do a complete job of overhauling.
(2) Likewise the tractor and its implements, and the truck.
(3) Arrange for systematic check-up and servicing of electric motors.
(4) Improve the output of workmen by supplying sharpened pruning tools.
(5) Remove old, unprofitable trees and filler trees which crowd the permanents.
(6) Set up a simple record of yields and market returns by varieties. The orchard business today cannot support nonprofit or low profit trees or blocks of trees. Such trees, unless required for cross pollination, should be removed.
(7) Study your fertilizer program to see if a revised soil management setup will improve yield, size and color of fruit. Then make sure of a fertilizer supply by placing your order soon.
(8) New spray materials suggest a careful and conservative review of your spray program. Seek the best information available if you are considering a change.
(9) Field and storage crates needing repair, also boxes in shook, provide workmen with jobs on stormy days.
(10) If your harvesting, grading, or other equipment has caused delays and only temporary repairs have been made, why not act now and order repair parts? Ordered parts may take longer than you think.

To protect the sprayer against rust and corrosion, Indiana growers have for many years used a mixture of three parts of crank case oil and one part of kerosene. In preparing the sprayer for winter, the suction hose is first removed from the supply tank and placed in a container filled with the oil-kerosene mixture. The motor is then started and the mixture allowed to flow through the pump and out the overflow pipe back into the container. After the motor is shut off, the pump drain plugs are removed and the surplus mixture allowed to drain out. Even though the outfit needs a complete overhaul later, it should first be given the above treatment. It involves little time and expense, and will give good returns in sprayer performance the following season.

-- O. G. Anderson

* *

How Dry is Your Storage? The easiest way to find out is to use a sling psychrometer, sometimes known as a wet and dry bulb thermometer. Seventeen of these inexpensive gadgets were recently bought by apple storage owners in Hampden County. The relative humidity should be 85 to 90%. In other words, the storage air should be at least 85% saturated. If it is less than that, the fruit tends to shrivel. It is well to remember that in many cases, boxes went into storage bone dry and that they have actually pulled water out of the apples. Visible shrivelling has already occurred in a few storages. How about yours?

* *

A VISIT TO BELTSVILLE

During the past summer the writer spent a very interesting day and a half at the U.S.D.A. Experimental Farm at Beltsville, Maryland. Much of the time was spent with Dr. G. M. Darrow looking over the strawberry and blueberry test plots although some time was also spent with four other workers along fruit lines. The more important observations are noted below. They suggest not only a wide range of experimental work but real progress in working out certain fundamental problems.

Blueberries. One of the handicaps in most varieties is an imperfect scar. This refers to the point of attachment of the berry, where damage frequently occurs in picking. Varieties with perfect scars are being sought. In scoring varieties as regards scar, Burlington is best with a rating of 10; Rubel, 8; Stanley, 4 to 6; Katherine, 1. In New Jersey a planting of about five acres has been established for the testing of varieties with reference to this important feature.

The present acreage of cultivated blueberries in the U. S. is about 10,000. Varieties in sight may increase the acreage to 50,000. But when varieties with perfect scar are developed, the acreage may increase to 100,000.

Many hybrid varieties are being tested including crosses between high and low bush species and the rabbit eye blueberry of the South. In North Carolina about 10 acres are under test and in Georgia about 20 acres. Of interest in Massachusetts are certain hardy highbush varieties, hardy half high and hardy lowbush, particularly those with large berries and a stiff stem.

Certain blueberry ailments, including "stunt", are found to be transmissible by budding. (Observations on strawberries, peaches, and apples will be included in the next issue of FRUIT NOTES.)

* *

"The Farmer's 1948 Income Tax". This is the name of a new publication (Special Circular No. 128) which came off the press in October, 1948. It was prepared jointly by the Extension Services of the six N. E. states, Delaware, New Jersey, and several federal agencies. A copy may be obtained from your county extension office or from the _____ University.

* *

A Suggestion on Pruning. In pruning a bearing apple tree, it is helpful to visualize the tree with a full load of fruit and a branch arrangement which allows each spur a partial exposure to sunlight. This means that each major branch has a definite space which it occupies without much competition. The downward growing parts of each branch are more poorly located from the standpoint of sunlight than the outward and upward growing parts. But frequently a towering upright branch is unneeded either because it is encroaching on a well located branch or is, itself, out of reach. When the pruning job is completed, the branches will be reasonably well spaced, and the tree will be thin enough to allow sunlight to filter through. Spraying, thinning and harvesting will be easier because a dense tangle has been transformed into an orderly arrangement of efficiently located fruiting wood.

* *

INDEX (Number in parentheses indicates month; second number, page)

* * * * * * * * * * * * * * * * * * * *

Apple Production by Varieties. The leading apple variety in the U. S. at the present time is Delicious. During the period 1942-43 nearly twice as many bushels were produced as of any other variety. The next three varieties in order of importance are Winesap, McIntosh, and Jonathan.

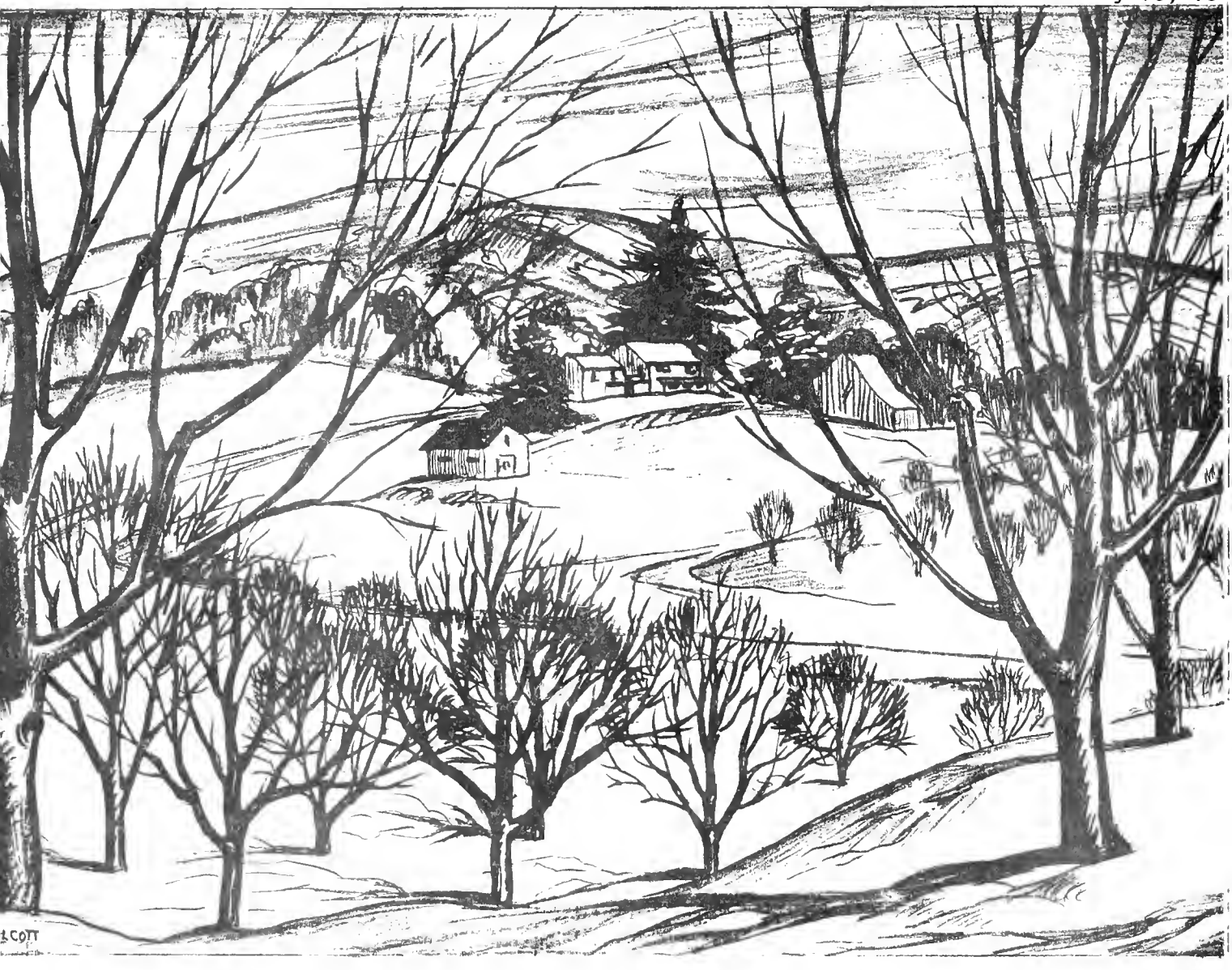
* * * * * * * * * * * * * * * * * * * *

Make Sure You Get HIGH MAGNESIUM Lime. The content of magnesium oxide in limestone varies from about .5% to 21%. A high magnesium or dolomitic lime is available if you insist on it. It takes about three pounds of lime to offset the acidifying effect of one pound of sulfur. Orchard soils must therefore be heavily limed every few years if a good cover crop is to be grown. High magnesium lime corrects soil acidity and also adds an extremely important element, magnesium. There is no cheaper form of magnesium for use in the orchard. It pays to read the label on the bag. Insist on high magnesium lime.

* * * * * * * * * * * * * * * * * * * *

Fruit Notes

February 10, 19



Prepared by the Departments of Pomology, Entomology, and Botany, and Other Staff Members
Compiled by W. H. Thies, Extension Horticulturist

CONTENTS

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

FOG OUT FARM FIRES WITH THE ORCHARD SPRAYER

Orchard sprayers with a pump capacity of 20 gallons or more per minute have rendered service above expectations in extinguishing fires in farm buildings. Using 300 to 500 lbs. pressure, the water is applied with an orchard gun creating a fog in the room or enclosure where the fire breaks out. This fog moistens all enclosed surfaces as well as the air, and suffocates the fire by excluding the oxygen. Control is obtained by the fog method with less water, offers some protection to the operator of the gun, and there is less water damage. Light, mobile, motorized fire equipment operating on the fog principle, is being purchased by rural communities.

During mild weather the orchard sprayer can be kept in readiness or prepared for fire service quickly. In freezing weather the most desirable storage space for the sprayer would be a frostproof room. Here water may be left in the sprayer engine, pump, and tank, so that the fog may be applied at the earliest moment after the fire starts.

Lacking a frostproof storage, the engine may be filled with anti-freeze. The sprayer tank may be filled nearly full of water, leaving space at the top for the expansion which occurs with freezing. The pump should be drained and some experienced workman assigned to replace drain plugs in case of fire. Make sure that water cannot seep in from the tank to the pump while the machine is stored. Check the battery occasionally to make certain it will start the motor.

Fire is a farm hazard of serious proportions. Where community fire equipment is not available, insurance rates are high. The repair or replacement of a cold storage at harvest time due to fire is a problem no grower wants to think about. A high pressure spray machine is the best type of fire fighting equipment available for farm use, and needs only to be kept in readiness.

-- O. G. Anderson

* * * * * * * * * * * * * * * * * * * *

APPLYING NITROGEN FROM THE SPRAY TANK

A rather revolutionary method of applying nitrogen to apple trees is currently receiving a lot of publicity. It consists of putting urea, a nitrogen compound which contains 43% nitrogen, in the spray tank and applying the nitrogen as a spray.

Five pounds of the urea compound to 100 gallons is the recommended dosage. The material may be put in with the regular insecticidal and fungicidal sprays or applied as a separate spray. There is no evidence that it is not compatible with regular spray materials and it has not caused any injury to foliage. Two schedules for applying are suggested. The first consists of four sprays commencing with two pre-blossom or pink sprays, one calyx and one at first cover. The second schedule of three sprays starts with the calyx followed by first and second cover sprays. Trees which are low in nitrogen and have a tendency to set a light crop should obviously receive the first schedule. Trees which have a good reserve of nitrogen and set heavy crops may get along all right with the second schedule.

Some of the advantages which are claimed for applying nitrogen as a spray are that more control is obtained of the nitrogen supply of the tree, better control of fruit set, higher red color of fruit, and better tree growth. In the case of a very dry spring when soil applications of nitrogen might not become available to the trees in time to influence set or when the soil is so water logged that

he roots cannot function, nitrogen sprays may have an advantage. However, recent results of experimental work carried on by the Cornell Experiment Statio failed to show any significant differences between soil applications or spray applications on yield, red color, size of fruit, shoot growth and set. There is no report on the effect of this method of applying nitrogen on the growth of grass or cover crop in the orchard.

It would appear that until more experimental evidence is obtained to indicate the possible benefits of nitrogen spraying, the grower must make his decision as to the method used, on the basis of cost. If he figures that he ca fertilize his orchard cheaper by spraying, it may pay him to try it.

-- W. D. Weeks

* * * * * * * * * * * * * * * * * * * *

SPRAY OILS

Oils are used on apples to control European Red Mite and San Jose Scale.

"Superior" type oils are: (a) More effective insect killers; (b) Safer for trees; (c) Available under several brand names. "Superior" is not a brand name.

Tank-mixing (emulsifying) a "Superior" type oil with Blood Albumin enables a grower to use: (a) A more effective and safer oil; (b) At a LOWER COST than a prepared miscible or emulsible oil or oil emulsion containing a less desirable oil.

Using a Tank-mixed "Superior" type oil is SURE, SAFE, SIMPLE, and SAVING.

Follow these simple steps to savings with "Superior" oils used the Tank-mix way with Blood Albumin Emulsifier. (a) Buy a "Superior" type straight or 100 percent oil. Two gallons of oil for each 100 gallons of spray. (Three gallons for Pear Psylla control in the Dormant.) (b) Buy a commercial Blood Albumin Emulsifier containing 25% (4 oz. in each pound)of blood albumin. One-half pound for each 100 gallons of spray. (c) Have the spray-rig ready to go -- with at least one hose equipped with a gun or broom that can be opened down into the tank.

When ready to make the application proceed as follows:

Standard Type Sprayer: (1) Start the motor, pump and agitator -- do not stop them until tank is sprayed out. (2) Run in 5 - 15 gallons of water - NO MORE - or just enough to make the pump work. (3) Add the commercial Blood Albumin Emulsifier; 1/2 pound for each 100 gallons the tank holds. (4) Pour in the "Superior" type, 100 percent or straight oil -- 2 gallons to each 100 gallons. (5) Turn on the pressure - open gun or broom into tank and hold for 1-1½ minute . In other words, spray the concentrated water-blood albumin-oil mixture back into itself for a full minute. More time does no damage, but is unnecessary. (6) Fi tank with water. (7) Open nozzles into tank to remove concentrated mixture from pump, hose lines and guns or brooms. (8) Spray the orchard.

Speed Sprayer: (1) Start motor. (2) Run in 5 - 10 gallons of water or as lit as possible and still have the pump and agitation system work. (3) Add the commercial Blood Albumin Emulsifier -- 1/2 pound to each 100 gallons. (4) Pour in the "Superior" type, 100 percent or straight oil - 2 gallons to each 100 gallons. (5) Allow the water - emulsifier - oil mixture to mix thoroughly [illegible]

1 to 2 minutes (Some nurse rigs have a lead of hose from the pump that could be directed into the tank.). (6) Fill tank with water. (7) Spray it out.

-- E. H. Wheeler

* * * * * * * * * * * * * * * * * * * *

DORMANT DN's -- Unraveled!

Some people are confused by the number of DN or dinitro spray materials now available for dormant sprays. One should remember that the older type DN materials contain dinitro-o-cresol. They are sold in the form of liquid slurries or suspensions of that salt or in the form of powders. Liquid forms contain 20% of the active ingredient and are represented by such brands as Elgetol, Krenite, Dinitrosol; the powders contain 40% of the active ingredient and are represented by such brands as DN Dry Mix No. 2 and DN Dry Powder.

These materials are compounded so that a quart of liquid is the equivalent of a pound of the powder. Used at correct dosages these materials will control Rosy Aphis and other Aphis, Bud Moth, and Oyster Shell Scale. They are recommended for use in the dormant period and are best used alone and not in combination with oils because of the danger of injury to buds under some conditions. (For Pear Psylla as ovicides, they are used in the green tip stage when the eggs are on the spurs.)

This year there are some new DN materials on the market. These contain the triethanolamine salt of dinitro-o-sec-butyl phenol. They are prepared in the form of a true solution of this dinitro compound. Used at only two quarts, they will control the insects mentioned above with the exception of Oyster Shell Scale which would require three quarts per 100.

There is the additional advantage that these new DN materials will control European Red Mite by killing the eggs in the dormant period. In other words, if an apple grower chooses to use one of these new DN materials, he can control Rosy Aphis, Bud Moth, and also Red Mite with the one dormant application. For some growers this represents a real advantage.

Where Bud Moth and/or Aphis are not problems, then the "Superior" type oils are still the cheapest and most satisfactory control for European Red Mite.

The new DN insecticides described above may be used safely on pears in the green tip stage as recommended for pear psylla control with the older type DN materials. Psylla eggs are killed by a concentration of 2 quarts in each 100 gallons.

Peach trees should <u>not</u> be treated with the new type of DN compound.

The new DN's are on the market as DN-289 and as Elgetol 318. This new kind of Elgetol is what makes the picture somewhat confusing. The new DN's are somewhat more potent than the older types and should be used on apples in the <u>strictly dormant</u> only.

It is important for fruit growers to decide which dinitro material they need for their orchards and then to make certain they obtain the one decided upon.

-- E. H. Wheeler

EXTENSION SERVICE PLANS PROGRAMS FOR NEW FM RURAL RADIO NETWORK

Announcement has been made that the Extension Service, University of Massachusetts, will participate within the next few months on programs of the Rural Radio Network, a new FM service beamed exclusively to farm families. This announcement comes from Willard A. Munson, director of the Extension Service. "Extension work with the Network must naturally be light at first," he states, "until FM radio enters more rural homes."

Extension specialists and county agents, in addition to resident and Experiment Station staff members and specialists from other government agencies, met recently on the campus with officials of the Rural Network. The delegates expressed interest in the new FM Network and agreed to cooperate. Plans are now underway for participation.

Director Munson reports the Network will carry detailed analyses of immediate market reports, weather reports for farmers, agricultural news, talks on farm practices and home management, as well as broadcasts from other agricultural schools and colleges -- in addition to federal, state, and private agencies.

The Rural Radio Network may be heard on WACE-FM, channel 100.3, from 6 in the morning until 9 at night. The WACE-FM channel reaches Central and Western Massachusetts, as well as many parts of Connecticut, New Hampshire, and Vermont, providing a static free radio signal.

The Network has been in operation for the past seven months in New York State, serving the entire milk shed region plus New York City proper with top flight farm information and entertainment.

-- George VanHorn

* * * * * * * * * * * * * * * * * * * *

RECENT REPORTS ON FRUIT DISEASES AND THEIR CONTROL

Effect of Nitrogen Fertilizer on the Control of Scab in McIntosh apples. In a number of crops, the nutrition level of plants has been shown to have a direct bearing on susceptibility to certain diseases. Especially is this true when the level of nitrogen and/or potash is involved. It is common observation that scab is difficult to control in apple trees growing in a poultry yard. Rapid, tender, succulent growth encouraged by excessive nitrogen seems to be at least one factor favoring copious scab development. D. H. Palmiter reported (N.E.F.G.A. meetings in Worcester, January 4, 1949) on a scab spray test in an orchard in the Hudson Valley where a number of McIntosh trees received the same sulfur spray program in each of 6 successive seasons. Some of the trees were not fertilized, some received nitrogen as usual in a spring application to the soil, while a third set received their nitrogen in the form of urea added to the spray tank in 2 or 3 early season spray applications to the trees. In the unfertilized trees the yield (average for 6 years) was only moderate, scab counts on harvested fruits low, percent of drops low and fruit color very good. For the trees that received Uramon in the soil, yield was much higher, but so was scab and the per cent of pre-harvest drops, and the fruit color was poor. For the trees that received nitrogen as Uramon or NuGreen in the spray, the average total yield per tree was nearly as high as for the ground applications, but scab was no higher than in the unfertilized trees, pre-harvest drop was intermediate between the checks and ground applications of nitrogen, and fruit color was

good. Strangely enough, in the same orchard, the highest yield of all, the lowest scab counts on fruits, and the lowest per cent of drops were obtained from trees that received no nitrogen either on the soil or in the spray, and that were sprayed with Fermate throughout the 6-year period. Fermate contains about 10% nitrogen.

Continued Use of Fermate Boosts Yield of McIntosh Apples. D. H. Palmiter of the N. Y. (Geneva) Station reported at the recent science meetings in Pittsburgh (Phytopath. 39:1:16,1949) that "The continuous use of Fermate (70 per cent ferric dimethyldithiocarbamate) on McIntosh apple trees which received no nitrogen fertilizer over a period of six years increased the yield of fruit 57 per cent over that of corresponding trees that were sprayed with wettable sulfur. Annual soil applications of two or more pounds of N per tree increased the yield of sulphur sprayed trees over that of the unfertilized Fermate plots during the first two years of the test but in the last three years the Fermate plots have outyielded even the best nitrogen fertilized plots. In 1947 and 1948 the best sulfur sprayed and nitrogen fertilized plots averaged 9 boxes of fruit per tree per year compared with 17 boxes of fruit per tree per year from the Fermate plots. Several factors appear responsible for this increased yield where Fermate is used as the fungicide in place of sulfur. Fermate contains some nitrogen and in a spray season a tree may receive as much as ¼ pound of N. However, other factors such as reduced scab and spray injury to the foliage may be just as important. In 1948 most of the trees in the experiment had close to 100 per cent bloom, but blossoms and fruit counts indicated more than 50 per cent increase in fruit set on the Fermate sprayed trees."

Ozone in Storage Rooms. U.S.D.A. Circular No. 765, Jan. 1948, contains a detailed account of tests in which Ozone was used in apple storages. Ozone has been used in humid meat, egg and apple storages for deodorizing the atmosphere and for preventing the growth of surface molds on meat, packages and walls. It greatly reduces the population of air-borne fungi including those that cause blue-mold and gray-mold rots of apples; and at standard concentrations (1.95 p.p.m. and times of exposure, it even slows up the rate of development of blue-mold decay in apples. However, it does not kill the fungus in decay tissue nor does it materially check the growth of mold patches that are already established on boxes, walls, posts, etc. Ozone, in fact, is a mild disinfectant, exerting its best influence on the spores by preventing or reducing their germination and the formation of surface growth.

Use of overconcentrations, i.e., 3.25 p.p.m. of Ozone in apple storages for equal exposure periods caused injury to apples, also off-flavor. No such deleterious effects resulted from concentrations of 1.95 p.p.m.

Ozone is a Stimulant for Certain Fungi. As indicated above, Ozone is toxic to the spores of some fungi. According to a report by M. C. Richards, New Hampshire Station (Phytopath. Abstr. 39:1:20,1949) Ozone actually is a stimulant for certain fungi. Under ordinary conditions the fungi in question produce spores very sparingly but when exposed to Ozone, they sporulate abundantly. In this category are the fungi that cause early blight of tomatoes, the black leaf-spot of cabbage, and the black-rot storage disease of winter squash.

-- O. C. Boyd

* * * * * * * * * * * * * * * * * * * *

NO JANUARY FRUIT NOTES - This is the first issue of FRUIT NOTES since December 30. Other matters, seemingly more urgent, have occupied our attention during January.

DIFFERENT STRAINS OF THE STRAWBERRY LEAF SPOT FUNGUS

It is well known that some varieties of strawberries are more susceptible to the common leaf-spot disease than others. However, it was only recently that several strains of the leaf-spot fungus (Mycophaerella fragariae) were found, some being decidedly more pathogenic to certain varieties than other strains. The following is a digest of an article by A. G. Plakidas (of the Louisiana Station) in Phytopathology 38:12:988-992,1948.

Seven isolates of the fungus from different parts of the country (Louisiana, Oregon, Michigan, Maryland, New York) showed widely different pathogenic properties when inoculated into ten varieties of strawberries. In fact, no two varieties reacted exactly alike to all of the strains. No two strains behaved similarly on all of the varieties. One variety, Caledonia, was moderately or highly susceptible to all seven strains. Clermont showed no infection from four strains, a trace from one strain, and heavy infection from two. Howard 17 showed a trace of infection from each of two strains, while U.S.D.A. Seedling No. 1021 yielded a trace of infection from only one of them. U.S.D.A. Seedling No. 1942 showed no infection from two strains, light infection from three others, and heavy infection from the remaining two. One isolate (S1600) from New York, produced moderate to heavy infection on all varieties except Howard 17 and U.S.D.A. Seedling No. 1021 -- only a trace on them. Strain S1610 (from Louisiana) produced moderate to heavy infections on all but three of the 10 varieties: no infection on them, Clermont, Howard 17, and U.S.D.A. Seedling No. 1021. In contrast there was one strain of the fungus, the Oregon strain (S83), that was weakly parasitic on most of the varieties; producing heavy infection on one (Caledonia), light infection on two, a trace on three, and none on four. Some varieties that remained free of infection under natural conditions took the disease when inoculated artificially. Howard 17 and U.S.D.A. Seedling No. 1021 were almost immune to all strains even when heavily inoculated. Certain varieties appear to merely escape the disease in the field by virtue of their growing habits, whereas Howard 17 and U.S.D.A. Seedling No. 1021 appear to possess marked inherent, "chemical" resistance to all forms of the fungus.

-- O. C. Boyd

* * * * * * * * * * * * * * * * * * * *

This So-Called Winter - The mean temperature in Amherst during December was slightly above the freezing point, and much of the month of January has seemed even more springlike. The writer set a few strawberry plants on January 8 (fall planting?) and on January 14, Howard Gilmore of Westboro brought to a meeting two apparently undamaged Baldwin apples which he picked in his orchard the previous day. No apple blossoms have been reported to date.

* * * * * * * * * * * * * * * * * * * *

New Pruning Leaflet - "Pruning Apple Trees" is the title of a new leaflet which will be ready for distribution in the very near future. It covers the pruning of both young and bearing trees and is well illustrated. A copy may be obtained from your County Extension Office or from the Mailing Room at the University.

* * * * * * * * * * * * * * * * * * * *

A VISIT TO BELTSVILLE (Continued from December Issue)

Following are a few observations made at the U.S.D.A. Experimental Farm at Beltsville, Maryland:

Strawberries - In breeding better varieties, a planting of 6100 seedlings is being studied. The numbers of seedlings and the characteristics are as follows: red stele resistance, 1283; late ripening, 1512; firmness, 1174; flavor, 684; size, 171. A striking example of the longevity of pollen stored at a temperature of about 40°F. and relative humidity of 30% was observed. Year-old pollen stored under these conditions germinated well and gave a good set of seed.

Among the virus diseases are crinkle, curl, witches broom, yellows (yellow edge in England), etc. One of the virus diseases, common in the East, results in shorter petioles on the Marshall variety and a tendency for the leaves to lie on the ground. Practically all plants of certain varieties are now infected. An attempt is being made to establish virus-free sources of our more important varieties using the grafting method of determining the presence of virus in doubtful plants. At present, plants of seven virus-free varieties have been isolated: Dorsett, Klondike, Marshall, Culver, Robinson, and two varieties of Tennessee origin.

Peaches - In a study of mineral deficiencies, magnesium deficiency was found to show up first where both calcium and potassium are high. Calcium seems to be a partial substitute for both magnesium and potassium. It has a striking effect on root development. Where calcium is low, roots are much restricted. High calcium means many fibrous roots. (A high nitrogen level was maintained in the above study.) In breeding peach varieties for hardiness, stations for testing are being established in various northern states. Up to 20 or 25 trees are available for this purpose. The University of Massachusetts is invited to cooperate.

Apples - In a study of apple trees under low, medium, and high nitrogen levels, no difference in magnesium deficiency symptoms was noted in the medium and high nitrogen levels but, in general, the symptoms were more severe on high, than on low, nitrogen trees. There seems to be a relation between night temperatures and the coloring of apples. If apples mature at a time when the nights are warm, color is likely to be inferior. One of the Beltsville workers told of a survey in the Northwest which shows a relation between the supply of nitrogen and yield. The optimum nitrogen level should be maintained, if possible, in every orchard. Following is a summary covering the yield in 23 orchards over a five-year period. Nitrogen fertilizers included ammonium sulfate, sodium nitrate, etc.

Number of Orchards	Actual Nitrogen Applied	Packed Boxes per tree (Range from 1940-44)
7	1 pound	5.3 - 13.1
11	1½-2½ pounds	7.5 - 15.1
5	3-4 pounds	4.9 - 19

* *

Have you ordered your High Magnesium, or Dolomitic Lime? Orchard soils are becoming increasingly acid. Magnesium deficiency symptoms are present on a surprisingly large number of farms. Many orchards will be greatly improved by 1 to 2 tons per acre application of High Magnesium Lime.

* *

PAINTING "TEMPORARY" TREES

We occasionally see fruit trees in which pruning wounds have been painted a bright red or green. The writer recalls one orchard in which wounds as small as half an inch in diameter had been carefully painted. Obviously, this represents a waste of time and paint. But there is a way in which paint of any color may be used to good advantage in a closely planted orchard. Wherever crowding has begun or threatens to be a problem in a few years, a paint mark on the trunk of each of the trees destined for ultimate removal simplifies the pruning job. Having decided which rows are temporary, only a little time is required to make this identifying mark on the same side of each tree in those rows. Then, at pruning time, there need be no question about which tree is temporary and which is permanent. The former may be slashed back enough to provide needed space, temporarily, while the permanent treos are allowed to spread out naturally. Half an hour spent in wielding a paint brush will help to eliminate guesswork in orchard reorganization. No ladder is needed for this task, and one paint mark on the trunk may result in more benefit than dozens of paint marks on pruning wounds here and there in the tree.

* * * * * * * * * * * * * * * * * * * *

A Nursery Oddity - Imagine finding an apple on a one-year whip! That actually happened twice in a Pennsylvania nursery last summer. The Yellow Delicious trees in question were well grown whips, budded in August, 1947. Whether or not the bud had differentiated before or after budding is unimportant. The fact is that the bud resulted in a blossom cluster the following spring, and that a vegetative shoot developed alongside to form a one-year whip about three feet tall. One of the blossoms was pollinated and a well-formed apple was found about four inches from the ground when the nursery was inspected in late July. The nurseryman might be justified in claiming that his trees are "ready to bear". At least he could prove his claim.

* * * * * * * * * * * * * * * * * * * *

Twenty-eight Compete for 3 Prizes - Competition was keen at the Pennsylvania Farm Show fruit exhibit January 10-14. In the Red Rome Class, for example, there were 28 plates and in the Rome Class about the same number. Total attendance at the Show was reported to be half a million.

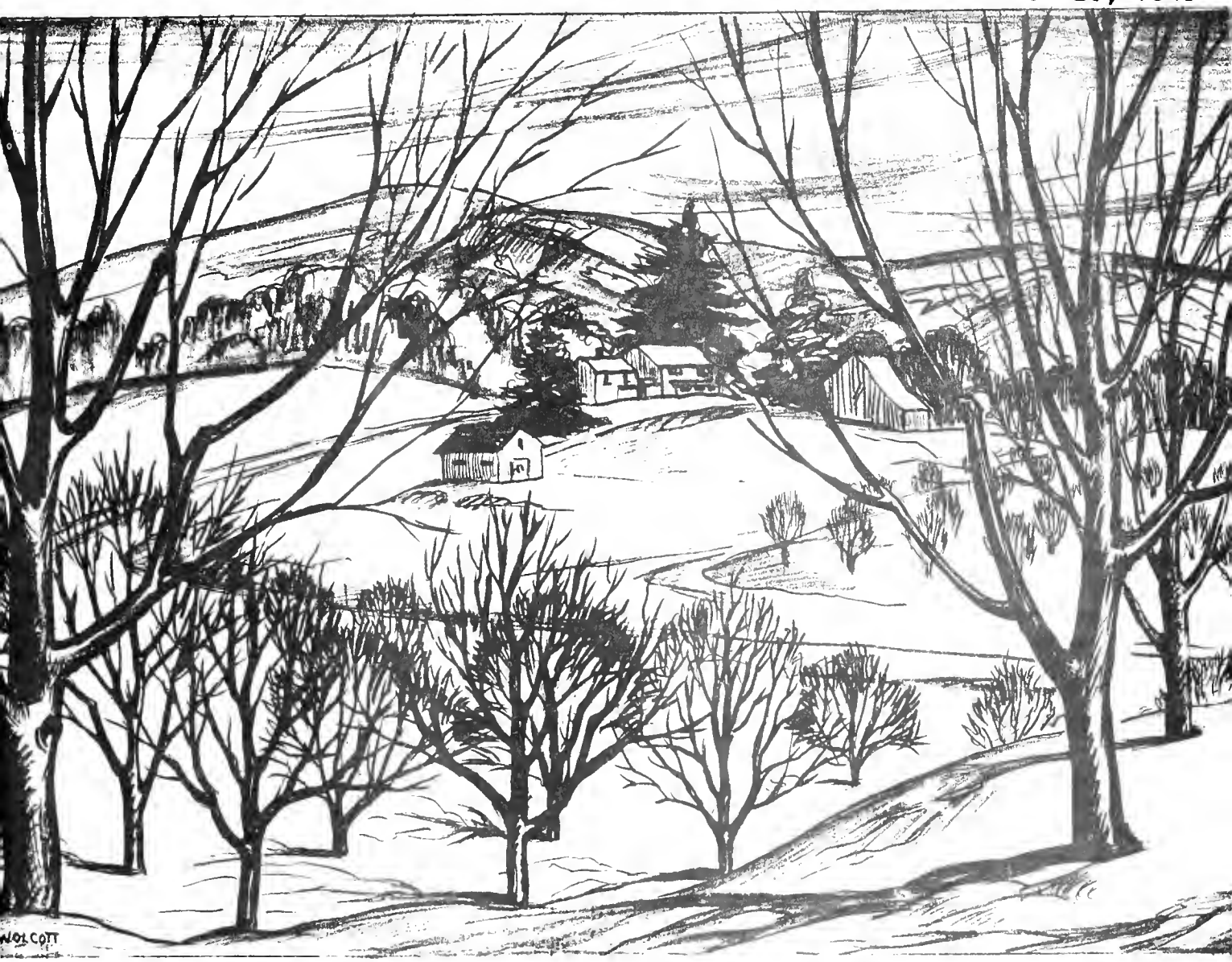
* * * * * * * * * * * * * * * * * * * *

The 1949 Apple Spray Chart - A supply of the newly revised apple spray chart has been delivered to each of the County Extension Offices. Your copy may be in the mail by the time this issue of FRUIT NOTES is received.

* * * * * * * * * * * * * * * * * * * *

Fruit Notes

MARCH 25, 1949



Prepared by the Departments of Pomology, Entomology, and Botany, and
Other Staff Members
Compiled by W. H. Thies, Extension Horticulturist

CONTENTS

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

EFFECT OF LIME SULFUR ON YIELD OF APPLES

(This article, prepared by Professor E. J. Rasmusser, University of New Hampshire, is of timely interest at this season when spray materials are being ordered and plans are being made for the fight against apple scab.)

L-S-L-F-D, L-S-M-F-D, Lime-sulfur means fewer dollars; Lime-sulfur means fewer dollars. Yes, Lime-sulfur, when applied as a spray for scab control on apples definitely reduces yields, and consequently means a reduced income to the orchardist. In fact, the old Lime-sulfur schedule was responsible to a large extent in some orchards for the biennial bearing of such varieties as Northern Spy. Some experimental work several years ago in New York showed that the apple foliage sprayed with Lime-sulfur was less efficient in the manufacture of carbohydrates for as much as 7 days after the application than unsprayed foliage. Since the carbohydrates are necessary in the growth of the tree, in blossom formation, and in producing a crop of apples, the Lime-sulfur sprayed trees should produce less fruit since they have less materials from which to develop the fruit. This was found to be true experimentally in some spraying experiments in Michigan. A block of Northern Spy trees which had been sprayed for a number of years with Lime-sulfur and which had shown low yields, sometimes a crop only once in three years, was divided into three plots. One plot was sprayed with Lime-sulfur, another with wettable sulfur, and a third with a fixed copper fungicide. The following table shows the effect of the spray treatment on defoliation and yield.

Effect of Spray Treatment on Defoliation and Yield of Northern Spy

(1939-1943 inclusive)

Treatment	Aver. No. of Leaves (100 spurs, August 20)	Aver. Yield in bu. per tree 1940-44	Percent Increase in yield over Lime-sulfur
Lime-sulfur, 2-100	474	39.0	----
Wettable sulfur, 8-100	603	51.2	28.5
Fixed copper-lime, 2-4-100	643	61.2	53.5

It is seen that there is a definite relation in the amount of foliage and the yield. The Lime-sulfur sprayed trees had smaller mishapen leaves and showed more defoliation and definitely lower yields than did trees sprayed with the other materials.

Yes, someone will remark after reading this information, "Why this data on Lime-sulfur when the material is out of date?" Some folks are going to continue to use Lime-sulfur, especially if 1949 is another favorable year for scab development and they fail to get control of the disease, hoping at least that the failure to obtain control was due to the material, and not to poorly timed and inadequate applications.

Another reason for giving this information on the effect of Lime-sulfur on yield is to emphasize the importance of studying the effect of all of the new pest control materials on yield and injury to the trees, as well as on pest control. Not enough emphasis is placed in spray research on the effect of the various materials on returns to the grower over a period of years. We are all looking for an easier way out. A year or two of experimental work does not tell the whole story on the merits of the various materials offered for sale by numerous insecticide and fungicide companies. Just because a material will control a pest doesn't guarantee it a place in a spray program. Use the old tried and tested materials until you are sure there is something better.

Be not the last to try the yet untried nor yet the first to cast the old aside.

* * * * * * * * * * * * * * * * * * * *

OFF-FLAVOR IN PEACHES SPRAYED WITH BHC

Benzene hexachloride has been so effective in the control of plum curculio that it looked very promising for the control of this pest on peaches. It was very disappointing to learn that BHC causes the development of off-flavors in some varieties, when canned.

Trees of the early varieties, Greensboro, Mikado, Marigold and Oriole, were sprayed three times, May 29, June 3 and June 10, with a combination spray containing 2 pounds per 100 gals. of 50% wettable BHC, containing 6% gamma isomer. Check trees were sprayed with a similar combination, without BHC. At harvest time samples from both BHC sprayed and check trees were taken to the Department of Food Technology for canning, freezing and later testing. Fruit of 32 other varieties, all of which had been sprayed with the BHC combinations, were likewise canned and frozen.

No off-flavor was detected in the fresh, canned, or frozen fruit of the check lots. Likewise, no off-flavor was detected in the fresh fruit of the BHC sprayed lots. However, among the canned lots of BHC sprayed fruits, a few varieties had a very strong off-flavor which made them practically inedible. Some varieties had a strong off-flavor which was bad enough to be unacceptable to some people. Other varieties had a slight off-flavor which would probably not be detected by many people. A few had no off-flavor.

After BHC sprayed frozen peaches were thawed and warmed to room temperature for tasting, no off-flavor of the BHC type could be detected. However, when peaches of nine of these varieties were reprocessed by canning, a slight off-flavor developed in five of them. It appears that heating brings out the off-flavor caused by BHC in certain varieties.

There were both white and yellow fleshed varieties among those which developed an off-flavor. Time of ripening made no difference. Greensboro (65 days from last spray to picking) and Eclipse (85 days) had a very strong off-flavor. Among those with a strong off-flavor were Mikado (65 days from last spray to picking) and Belle of Georgia (103 days).

The peach spray schedule which will be available soon states that BHC, benzene hexachloride, in any form should not be used on peaches. Instead, 6 pounds of 50% wettable DDT per 100 gallons is recommended for the control of plum curculio.

-- John S. Bailey, & William B. Esselen, Jr.

* * * * * * * * * * * * * * * * * * * *

FOG FIRE EQUIPMENT

A fruit grower exporting apples may sustain a heavy loss if the cargo is lost at sea or his crop is damaged in transit. But his loss is much greater if his apple storage burns down before he can dispose of the stored apples.

Realizing that the pressures developed by orchard sprayers produce a superior fog type of spray, especially effective in fighting fires, state and county officials in some states have adopted their use. In Kent County, Michigan, two fog type spray outfits were obtained several years ago and housed in the garages of the highway department in rural areas. Today that county has seven outfits. All the firemen are volunteers.

Some agricultural engineers believe that orchard sprayers represent one of the most effective types of fire engines ever developed. The average spray tank full of water applied in a fog may be fully as effective in fighting a fire as two to three thousand gallons applied in a solid stream.

The fog expelled from a gun at customary orchard pressures is so fine that when it contacts the fire it turns to steam. While this happens it absorbs heat and it helps to push the oxygen away from the fire. This accounts for the amazing speed with which these fog guns subdue a fire, and with much less water than a conventional fire engine uses. Water damage to property is reduced, and the limited supply of water in most rural areas is utilized to the utmost. In the February 10th issue of "Fruit Notes", an article offered suggestions on keeping a spray rig in readiness for fighting fires in winter. Not only growers, but rural communities, are adopting this safety measure in some states.

Pennsylvania State College has received most favorable reports from thirty towns using fire trucks equipped for high pressure applications of water with fog guns. Neighboring fire companies show a fine spirit of cooperation. The many thousands of spray rigs on U. S. farms could be of tremendous value in reducing the $100,000,000 annual loss from rural fires.

-- O. G. Anderson

* *

RECENT REPORTS ON FRUIT DISEASES AND THEIR CONTROL (continued)

Fermate Superior to Bordeaux on Grapes. Our present recommendations for using iron carbamate instead of copper fungicides on grapes are based primarily upon experiments conducted prior to 1948 by the N. Y. (Geneva) Station. A. J. Braun of that Station reports further on the tests (Phytopath. Abstract 39:1: 3,1949): "Concord vines sprayed two seasons with Bordeaux Mixture, 4-4-100 and 8-8-100, and with Fermate (ferric dimethyl dithiocarbamate), 1-100 and 2-100, showed accumulative effects of the treatments. The data were obtained from control-pruned vines on which the number of buds was determined by the weight of the previous season's shoot growth. Three applications of Bordeaux Mixture decreased vine growth as measured by length of shoot and petiole. Similar applications of Fermate increased the vine growth. Berry size was decreased by Bordeaux Mixture and increased by Fermate. Bordeaux Mixture delayed ripening of the fruit. The vines sprayed with Fermate yielded more than the unsprayed vines (yields adjusted for disease control) whereas those sprayed with Bordeaux mixture yielded less. By taking advantage of the increased vine growth resulting from the Fermate applications, greater increases in yields may be expected. Early applications of Fermate decreased the retarding effects of later applications of Bordeaux Mixture."

A Mist Sprayer and a Spray-Duster that Really Work on Fruit Trees. Plant pathologists at Cornell University (Ithaca, N. Y.) report the following (Phytopath. Abstract 39:1:19,1949): "A sprayer for fruit trees, developed at Cornell University, applies either wetted dusts or mist spray formulations. The spray, or spray-dust, is carried by an air stream delivered from a 3-inch slot, 8 feet long, set at an angle of 35° from the horizontal. The air delivery of the machine now under test is approximately 20,000 cu. ft. per min. at 105 m.p.h. Means are provided to adjust the angle of the air streams to compensate for wind interference. There is a saving of water of approximately 7/8 of the amount used in conventional spraying. Control of apple scab, cherry leaf-spot, and peach leaf curl has been equal or superior to that obtained by conventional methods. Sulfur, lime sulfur, low soluble copper compounds, ferric dimethyl dithiocarbamate, 2-heptadecyl glioxalidine, dinitro ortho cresol, and insecticides have been applied. Experiments on the control of fruit insects have been made in cooperation with entomologists. Both the spray-dust and mist spray methods are effective, but the latter is more economical of materials and is mechanically simpler. Disease control and chemical deposit data indicate that adequate coverage is obtained with this machine, which offers advantages over conventional sprayers in ease, speed, and economy of operation."

Cooling Peaches After Harvest Reduces Brown Rot. The following report by experimental station workers in Indiana (Phytopath. Abstract 39:1:22,1949) appears to have more promise for post-harvest control of peach brown rot than various pre-harvest spray and post-harvest dips employed by various experiment station workers in 1948: "During the past three seasons brown rot has caused serious losses to the Indiana commercial peach crop in storage. Common fungicides applied in the orchard have not adequately prevented these storage losses. Comparable samples of peaches were harvested in duplicate from

several orchards in 1948. One sample was placed immediately in common storage at room temperature, and the other sample was exposed to a 24-hour cold storage treatment at 40°F. before being placed at room temperature. The incidence of brown rot development was recorded daily over a 6-day period following harvest. In samples obtained from commercially sprayed orchards, cold storage treatment greatly reduced the subsequent development of brown rot in common storage. Brown rot losses were reduced from 41.8% four days after harvest to 0.0% in one commercial sample. Similar effects of cold storage were obtained with fruit sprayed with Phygon (2,3-dichloro-1,4-naphthoquinone). This evidence is opposed to the view commonly held by growers and fruit handlers that brown rot development is accelerated when fruit is removed from cold storage to room temperatures."

Midsummer Oil Spray Causes Storage Scald of Apples. Although summer oils are not generally used in apple orchards in Massachusetts, the following report (Phytopath. Abstract 39:1:24,1949) implies that fruit scald may result from such applications: "The application of spray oils at ovicidal concentrations during July and August has resulted in an unusual type of storage scald of apples in West Virginia. This relationship was suspected in 1944-45 and was confirmed by experiments in 1945 and 1946. The "oil scald" appears in storage as small, sharply delimited, circular spots. They are centered around lenticles and are small, usually two or three, or rarely as large as five, millimeters in diameter. Larger lesions are the result of coalescence of smaller single layers of hypoderm which are plasmolyzed and discolored. The light brown color of the dead cells is modified by the color of the fruit: the color of the lesions varies widely dependent on whether the spots are on red, green, or yellow portions of the apple. The severity of the "oil scald" increases during the late storage period; but it is abundant long before normal breakdown of the fruit occurs."

Nematode Root Disease of Peach Trees in New England. The meadow nematode group, Pratylenchus species, injures the roots of a number of crops in the southern states. In recent years, this pest is definitely assigned as the cause of the brown root-rot disease of tobacco in states farther south, and it is strongly suspected as the primary cause or starter of brown root-rot in Connecticut Valley tobacco. Its choice host plants are cereals, i.e., grasses, small grains, corn, etc. Now comes a report from Extension Fruit Specialist Frank D. Johanson of Connecticut that the meadow nematode is suspected to be at least one prominent reason for the decline in the life span of peach trees in that state. It is well known that the roots of peach trees throughout the southern states are highly susceptible to the root-knot nematode, but there has been little evidence that the meadow nematodes are potential invaders of peach roots. Professor Johanson's release is based upon a report from the USDA Nematology Division on a diagnosis of diseased peach roots submitted by Mr. Johanson. Incidentally, the meadow nematodes enjoy a much wider and farther-north range of distribution than the root-knot nematode.

-- C. C. Boyd

* *

SOIL MANAGEMENT METHODS FOR RASPBERRIES

Recent reports from Nova Scotia give some interesting results with red raspberries when grown under four different systems of soil management. Yields for the past two years were as follows:

	1947	1948
Sod	280 pints	75 pints
Clean Cultivation	3018 pints	1193 pints
Hay Mulch	3396 pints	1046 pints
Sawdust Mulch	4883 pints	1731 pints

The lower yields in 1948 were the result of severe killing of canes the previous winter. All plots were fertilized with a 9-5-7 fertilizer, 1000 pounds per acre. The sawdust used was "run-of-the-mill" which was mostly spruce.

The superior yields from the sawdust plots are accredited to a heavier stand of healthy canes in the fall, less winter injury and less anthracnose than under hay mulch. The amount of winter injury and anthracnose in the sawdust mulch plots were somewhat greater than in the cultivated plots, but the greater number of canes in the sawdust plots apparently still left more good canes for fruiting.

-- A. P. French

* * * * * * * * * * * * * * * * * * * *

STRAWBERRY YIELDS REDUCED BY YELLOWS

Yellows, a virus disease of strawberries, long a serious problem in the West, is now also causing heavy losses in the East, reports the U. S. Department of Agriculture. J. B. Demaree, plant pathologist of the Department finds the greatest concentration of the disease in the Middle Atlantic States but has observed the infection as far South as Teacheys, N. C. The disease is spread by aphids.

Mr. Demaree finds that not only are most of the older varieties such as Aroma, Catskill, Dorsett, Dunlap, and Howard 17 (Premier) infected, but that some of the more recently introduced varieties such as Fairpeake, Midland, and Maytime carry the virus.

The disease is not so easily recognized in eastern varieties as it is in Marshall and Marshall-like varieties grown west of the Rockies where conspicuous yellowing of the leaf edges is a tell-tale symptom. This is masked or transitory in many of the eastern varieties. Here the symptoms are dwarfing of plants and lack of vigor. In the fall they show up in poor runner production. These symptoms become accentuated in the second year. Eastern growers,

not recognizing the trouble, have believed that weak, hard-to-grow plants were the result of varieties "running out." The effect in all varieties is reduced yield.

Mr. Demaree suggests attacking the problem in two ways in order to eliminate yellows from strawberry stocks. One is for the growers themselves to use only vigorous plants taken from fields known to be productive. He recommends plants that are making runners freely and with large green smooth leaves on upright stems.

The other is for research workers to index the more desirable varieties to find stocks of each that are virus free. This is done by grafting a plant of the variety under test to a virus-free indicator plant of the Marshall or Marshall-like varieties. Plants proved free of virus must be carefully propagated in an aphid-free area and used to replace present infected stock.

Mr. Demaree believes this indexing can best be done by State experiment station workers. Since each State grows comparatively few varieties, he says it will be a relatively small task to index those best adapted for that particular State. When enough have been propagated, a portion can be distributed to plant growers for mass production under State regulations that assure maintenance of clean stock.

* *

More about Lime Sulfur. The increase in yield from using elemental sulfur instead of lime sulfur over a 10-year fruiting period in a Maine orchard was 32%, or over 5 bushels per tree. The additional annual cost of the elemental sulfur was only about 5 cents per tree. When some of the trees, after the 10-year period were shifted from elemental sulfur to lime sulfur or vice versa, there was a delay of one year before the change affected bloom or yield.

* *

Note on Apple Scald Control. When a single variety was stored in a room, consistently good scald control was obtained in New York State through air purificating with activated cocoanut-shell carbon. Control of scald was obtained with mixed variety storage in some instances but in 9 out of 16 tests commercial control of scald was not obtained on Rhode Island Greening apples. Air purification with activated cocoanut-shell carbon added, on the average, about 3 weeks to the storage life of apples. With McIntosh and Cortland about a month was added from the standpoint of fruit firmness.

* *

Using an Oil Spray This Spring? Then you should be sure to get a "superior" type oil. (See Note 3 on your 1949 Apple Spray Chart)

* *

LOOKING FOR ARD TO NEW PEACH VARIETIES

Some of the old varieties of peaches which are no longer grown to any extent as well as the present commercial list were discussed in recent issues of "FRUIT NOTES." While it is interesting to know what has happened to the standard varieties of yesterday and important to know about the commercial varieties of today, it is even more important to know what the promising new varieties are like. From among these new peaches will be picked the commercial varieties of tomorrow.

One of the newest varieties is Erly-Red-Fre. It is an early, white-fleshed peach of very good quality. In 1948 it ripened five days ahead of Marigold or about three weeks ahead of Golden Jubilee. It is attractive and is said to produce quite uniform, medium sized fruits. In spite of its tendency to cling it looks promising as an early variety when few local peaches are available. Further trial will be necessary to establish its real worth.

Raritan Rosé, formerly N. J. #97, a cross between J. H. Hale and Cumberland, is another early, white-fleshed peach. It ripens about three days before Golden Jubilee in Oriole season. It is firm fleshed, attractive, freestone and medium to large in size. The flavor is very good. The tree is moderately vigorous and very productive. The fruit buds are medium or a little better in hardiness. It is the best white-fleshed variety of its season.

Early Halehaven originated in Michigan as a limb sport of Halehaven. It appears to be like that variety in most respects except that it ripens earlier, about with Oriole. It is a yellow-fleshed freestone of fair to good quality and is well colored and attractive. It has not been fruited enough in Massachusetts to get a real estimate of its value.

Red Haven, a cross between Halehaven and Kalhaven from Michigan, is an early yellow fleshed peach of considerable promise. It ripens toward the end of the Oriole season and into the first of the Golden Jubilee season. The fruit is very firm, medium sized, freestone, has a thick, tough skin and fair to good flavor. It is an outstandingly attractive peach which develops a very high red color even in the center of the tree. The tree is vigorous and very productive. Considerable thinning of the fruit is required to maintain size. Fruit buds are quite a bit more hardy than Elberta.

Sunhigh originated at the New Jersey Experiment Station from a cross of J. H. Hale and a seedling of a Carmen x Slappy cross. The fruit is yellow-fleshed, medium to large in size, very attractive and very fine flavored. It is usually freestone but has a tendency to cling in wet seasons. The tree is moderately vigorous but bears heavy crops. The fruit buds are moderately hardy. It ripens about with Halehaven.

Kalhaven is a Michigan peach which resulted from a cross between J. H. Hale and Kalamazoo. The fruit is attractive, medium to large in size, has firm, yellow flesh and is usually freestone but has a tendency to cling in some years. The quality is fair to good. The flesh is a bit stringy and coarse in some seasons. The skin is thick and tough which with the firm flesh should make it

a good shipper. The tree is fairly vigorous and very productive. In fact, it will probably require thinning to get good size. It is reported to be above average in hardiness. It ripens between Summercrest and Elberta.

Sungold is a seedling of unknown parentage which orginiated in Iowa. The fruit is yellow-fleshed, freestone and medium to large in size. It has good or better quality in most years. The skin is medium thick and tough. Pubescence is noticeable but not objectionable. It ripens about two days ahead of Elberta. The tree is dwarfish like J. H. Hale but bears heavy crops, so heavy in fact that considerable thinning is necessary to maintain size. This variety is apparently outstandingly winter hardy in both buds and wood. It deserves further trial, for this reason, if for no other.

-- John S. Bailey

* * * * * * * * * * * * * * * * * * * *

Note on Organic Gardening. The advocates of organic gardening have at least one idea on which most gardeners will agree, namely, that compost is an excellent material in the garden. There is much less agreement with their contention that plants fertilized according to a carefully specified method, without any inorganic fertilizers whatever, will be less troubled by insects and diseases and will contain larger amounts of certain valuable food elements. An example of unscientific thinking is found in a recent article which tells about a chemist who has been employed to make analyses of organically produced foods. Quoting from this article, "We are certain it will show not only larger quantities of proteins but proteins of a different quality. It will assuredly show larger amounts of vitamins." Unlike the research projects in which a sincere attempt is made to obtain an answer to a question, we have here a case of drawing conclusions before the experiment is performed.

* * * * * * * * * * * * * * * * * * * *

A Bargain in Magnesium. There is no longer any question about the necessity of replenishing the supply of Magnesium in our soils. A little arithmetic will show that High Magnesium, or Dolomitic Lime offers a very inexpensive solution to the problem. If the Magnesium Oxide (MgO) content is 20%, the cost per pound today of this essential compound is only about 1½ cents. The MgO in Epsom Salts will cost at least 15 times as much.

* * * * * * * * * * * * * * * * * * * *

A very promising repellent for both deer and rabbits was discussed at a recent meeting in Washington. This material, not yet available for distribution, will be tested in Massachusetts. The preliminary reports are almost too good to be true.

* * * * * * * * * * * * * * * * * * * *

Fertilizing According to Tree Needs. Apple trees growing in sod are generally somewhat deficient in Nitrogen; hence, the common practice of giving the tree a few pounds of a nitrogenous fertilizer each spring. But if we guage the application by age of tree or trunk diameter, we are likely to give certain trees too much Nitrogen, and others too little. Better indicators of Nitrogen needs are (1) average terminal growth, (2) color of fruit last season and (3) the amount of pruning the tree has received. A tree pruned rather heavily needs less Nitrogen than an unpruned tree. And a tree at the bottom of a slope where it has access to a deep, fertile soil may be making adequate growth without additional Nitrogen. So instead of making a blanket application, our program should be flexible enough to take into account the needs of each individual tree. Obviously, if we add the nitrogenous fertilizer (urea) to the materials in the spray tank, and thus apply an amount of Nitrogen in proportion to the number of gallons the tree receives there is no assurance that the Nitrogen needs of the tree will be met. A large over-vigorous McIntosh tree which may need no Nitrogen at all will actually get an over supply because more gallons of spray material are required for complete coverage.

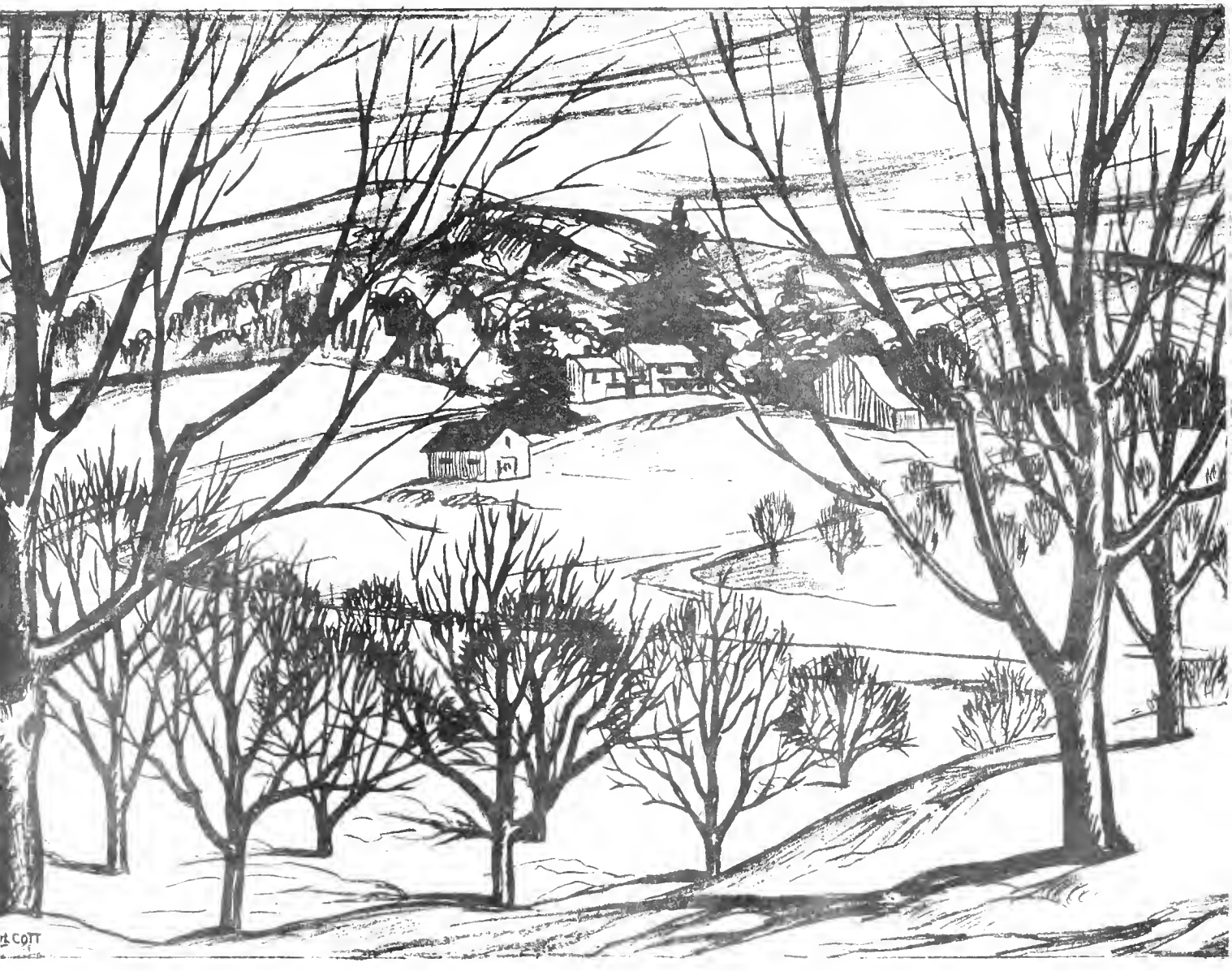
* * * * * * * * * * * * * * * * * * * *

Next Month -- A new feature, covering observations in a particular County, will begin in the April issue of "FRUIT NOTES". (Worcester County will initiate this new, down-to-earth review of local items.)

* * * * * * * * * * * * * * * * * * * *

Fruit Notes

APRIL 30, 1949



Prepared by the Departments of Pomology, Entomology, and Botany, and
Other Staff Members
Compiled by W. H. Thies, Extension Horticulturist

CONTENTS

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

ARTIFICIAL POLLINATION OF APPLES

Artificial pollination has been a topic of considerable interest to growers in the Northeast for a good many years. In seasons when the blossoming period is cool and wet and fruit set is apt to be light, the interest in artificial pollination is at its height. Also, there are still occasional orchards where self-unfruitful varieties have been planted in solid blocks and in such places the problem of cross-pollination is an annual one unless some other varieties are planted or top-worked in the block.

The types of artificial pollination which have been tried and tested experimentally to a certain extent are: (1) hand pollination; (2) pollen spraying; (3) pollen dusting; (4) airplane pollination; (5) pollenbombs; and (6) bee-hive inserts. Of these 6 methods hand pollination has been by far the most reliable to date.

Hand pollination. This method is time consuming and expensive but may pay for itself when natural means of pollination are inadequate. A grower may purchase pollen or collect his own from suitable early blooming varieties such as Astrachan, Duchess, and Wealthy. One should be certain that the variety of pollen obtained is suitable for the variety to be pollinated. Baldwin, R. I. Greening and Gravenstein are varieties which have pollen which is undesirable for cross-pollination purposes. The pollen may be applied with an artist's #4 brush which has the bristles clipped off straight and held closely with a small rubber band or with the eraser end of a pencil. Flowers are most receptive immediately after they are open. Pollinating one flower in every 5 or 6 clusters on a heavily blooming tree is adequate. Two or three ounces of pollen by volume is enough for one acre. For those of you who may wish more detailed information on this method, it may be obtained from the Department of Pomology, University of Massachusetts, Amherst, Massachusetts.

Pollen spraying. Adding pollen to water in a sprayer and applying it as one would a fungicide or an insecticide has been unsuccessful. The pollen does not seem to stick to the stigmatic surface. Also, the stigmatic surface is so exceedingly small that the chances of pollen grains landing there are very slight. Tests in Washington indicate that after the pollen has been in water 15 to 30 minutes its germinability was greatly reduced. In Vermont it was found that pollen was practically non-viable after passing through the sprayer.

Pollen dusting. A bellows type of hand duster has been reported upon by experimenters in Washington. They find it exceedingly wasteful of pollen and apt to result in a very uneven set of fruit unless extreme care is used. Those sections of the tree which were directly in line with the dust stream may be set so heavily that considerable hand thinning must be done. Apparently this method is better adapted to such fruits as cherries.

Airplane pollination. In tests conducted in the Wenatchee Valley of Washington this method has failed to show any increase in set over limbs which were protected by bags during the airplane dusting period. Some growers in the Northwest have tried this method and felt that a set of fruit resulted because of it. However, the absence of any untreated portions of the treated area often makes it impossible to judge the results. It seems doubtful that this method has any value. When one considers how extremely small the stigmatic surfaces are compared to the total surface area of the petals and foliage on a tree it is not

difficult to appreciate why this method does not seem to work. The pollen has to contact areas the size of pin-points in order to be effective and for the pollen to land on such small "targets" is highly improbable.

Pollen bombs. This method has been tested experimentally, also, and reports show that no increase in fruit set has resulted. Germination tests on pollen exploded from such bombs showed an almost complete lack of viability.

Bee-Hive Inserts. This method consists of a pollen-bearing insert placed in the hive opening. It is so constructed that bees entering the insert as they leave the hive will contact the pollen. The results with this method show that its value is very questionable. Apparently an insert will reduce the normal activity of the bees in the hive considerably. Also, some bees may collect pollen from the insert and after flying a short distance immediately re-enter the hive. A fundamental difficulty with this method is that during cool, cloudy blooming seasons, when pollen dissemination is a problem, the temperature and other conditions may be such that bee flight is limited. Bee flight is greatly reduced at temperatures below 60°F.

-- F. W. Southwick

- -

SPRAYS FOR FRUIT THINNING

A rather detailed discussion of chemical thinning has been prepared covering the use of both dinitro and hormone materials for apples and peaches. As far as possible suggested dosages and timing have been given for individual varieties. For those who are interested in thinning, copies may be obtained by contacting your local county extension office or the Department of Pomology, University of Massachusetts, Amherst, Mass.

Where the crop was light in 1948 many apple varieties can be expected to produce a heavy bloom. In such cases there is always the possibility of an excessive set, hand thinning costs, small apples at harvest, and biennial bearing in following years. Chemical thinning may be of considerable help where an excessive set is likely.

-- F. W. Southwick and W. D. Weeks

- -

Boron Every 3 Years. If you have experienced any Internal Cork in years past and haven't applied Borax since 1946, you should make '49 a "Boron Year." Fifty pounds of Borax per acre every three years is apparently enough to provide the small amount of Boron, an essential minor element, needed for the development of normal fruit.

- -

COUNTY AGENT'S CORNER

(Some observations in Worcester County by Homer Mills)

The Family Touch in Scab Control. Once a year when the spray season arrives, fruit growers are concerned with scab control in their orchards. Scab infection is closely related to the prevailing weather conditions. The man on the fruit farm must not only be a good orchardist but he also must be a weather man in his own right. A Leominster fruit grower, better known as "Fitzie" among fruit men, watches weather developments in his orchard very carefully. As a matter of fact, he has his entire family, Mrs. Fitzgerald and his two boys, weather conscious. They all watch the weather, jot down when rainy periods start, check the thermometer, keep accurate records; and upon these observations and records Fitzie runs his scab control program.

Something New Along the Equipment Line. A considerable amount of war surplus equipment has found its way onto New England farms. Among the more popular is the humble jeep. Perhaps few of us ever thought that the heavy and cumbersome army half-track would find a place on the farm. Yet Paul Washburn who operates one of our larger fruit farms here in Worcester County obtained an army half-track and has mounted his speed sprayer on the back of it. This half-track was far cheaper than any tractor he could have bought. Furthermore it is especially adept for getting in and out of wet places in the early spring. Perhaps this piece of equipment has a future on our fruit farms.

S.C.S. On the Fruit Farm. The Soil Conservation Districts have been doing a considerable amount of work on Worcester County fruit farms. Just recently they completed a drainage ditch out at the farm of Commissioner John Chandler in Sterling. This drainage ditch will help to take off excess water from an orchard block about 25 acres in size. Removing this excess water will give the trees a better chance to develop and will also enable the Chandlers to get in that orchard early in the spring without danger of bogging down.

Many fruit growers here in Worcester County are clearing land in preparation for setting new fruit blocks. Jim Hyland over in Fiskdale has just had a 15-acre plot cleared by a district contractor, and Fred Heidtmann is using them down in Millbury to clear up an 8-acre woodlot where he plans to set out a few trees this year. This work had previously been provided for in their complete Conservation plan. Fruit growers realize the importance of setting out new fruit blocks so that they will have young trees coming along to take the place of old ones. This is certainly a healthy sign indicative of a progressive fruit industry. This cooperative activity between orchardists and Conservation Districts, leading to the drainage of wet land, waterhole construction, stone wall removal and land clearing, is a concrete contribution to the productivity and efficiency of orchard promotion.

Your Own Fire Department. Mr. Howard Gilmore's orchard is quite a distance from the local fire department. We know that in a short length of time a fire can do quite a bit of damage, especially if there is a high wind blowing. Mr. Gilmore realizes that in his orchard sprayer he has an excellent piece of fire

fighting equipment and he really uses it as such. He keeps it filled with water at all times. He has a spray gun especially designed for fighting fires. The sprayer is always ready for quick action, and if and when a fire does break out at his farm, he can have his sprayer on the job with little waste of time.

- - - - - - - - - - - - - - - - - - - -

RED APPLE CLUB - 1949

The requirements for Red Apple Club membership in 1949 are as follows:

Acreage. In orchards of 5 to 15 acres, the owner may select for inspection one block of at least 3 acres and he may designate one variety to be inspected. The block must be one of well defined boundaries and not a section of a larger block. In orchards of more than 15 acres, at least 20% of the total acreage will be included. The minimum sized orchard is 5 acres.

Score, Grade, and Yield. The crop must (1) score at least 90% free from insect and disease blemishes, (2) grade at least 65% U.S.Fancy and (3) the yield of all varieties must amount to at least 200 bushels per acre on trees less than 15 years old, 300 bushels per acre on trees 15 to 20 years old and 400 bushels per acre on trees 20 years old or older. The total yield will be estimated at time of sampling and this record will be supplemented later by the owner's actual count.

Records. The owner should keep a record of his spray and dust applications including dates, materials, time involved and such other information as will be needed in determining the per bushel costs of pest control.

(The method of sampling the block in question and the details of sealing and inspecting the sample will be described in a release shortly before harvest time.)

- - - - - - - - - - - - - - - - - - - -

Can You Use This Equipment? One of our larger growers has two pieces of surplus equipment: (1) a large capacity sprayer in excellent condition with 400-gallon tank and (2) a 500-gallon wooden tank to be used as a supply unit for hauling water to the sprayer. Details on request.

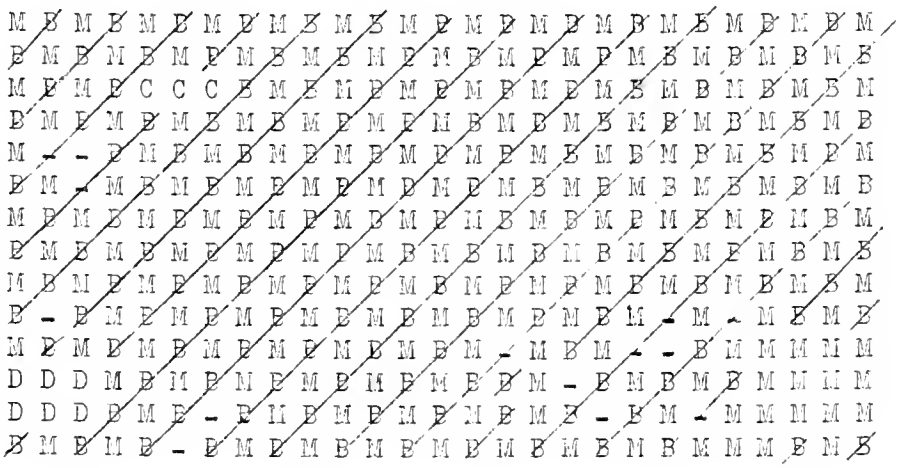
- - - - - - - - - - - - - - - - - - - -

Mice, Grass and Trees. Mice are found in orchards in spite of the trees, not because of them. They live mainly on grass and if a heavy grass cover happens to coincide with a tree trunk, the stage is set for a girdled tree. But if the grass is scanty, the mice will be elsewhere and the tree will be in no danger of girdling.

- - - - - - - - - - - - - - - - - - - -

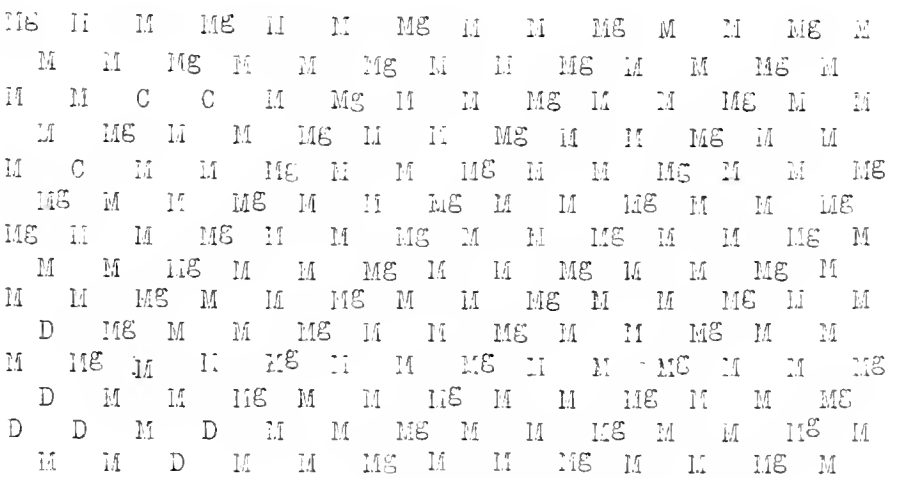
REORGANIZING AN ORCHARD FOR BETTER POLLINATION.

Following is a representation of a 7-acre block (about 54 trees to the acre), mainly McIntosh and Baldwin with a few Cortland and Delicious and the usual assortment of "skips" or blank spaces. Pollination of McIntosh, except in the vicinity of the Cortland and Delicious trees, is very poor (Baldwin being ineffective for that purpose). By removing the Baldwins in every other diagonal row, transplanting 5 trees which would otherwise be removed, and top grafting every third row of McIntosh, a crowded block with irregular bearing habit is transformed into a high producing block in which every McIntosh tree is adjacent to a pollenizer.



M - McIntosh
B - Baldwin
C - Cortland
D - Delicious
Mg - McIntosh (top grafted)
\- Blank space

Block before removing Semi-permanents, Transplanting and Top Grafting



Block after reorganization

SOME FACTS ABOUT FROST

Critical temperatures for fruits at different stages of development are indicated by the following figures. They represent temperatures endured for 30 minutes or less, without injury.

Kind of Fruit	Buds Closed but showing color	Full Bloom	Small Green Fruits
Apples			
Delicious	25°F.	28°F.	29°F.
Rome Beauty	23	27	29
Pears			
Beurre Bosc	27	29	29
Winter Nellis	26	28	29
Peaches	25	27	30
Cherries	28	28	30
Plums	25	28	30
Grapes	30	31	31

- - - - - - - - - - - - - - - - - - - -

Records from various stations in New England reveal wide variation in dates of the last killing frost.

Station	Average Date of last Killing Frost in Spring	Date after which frost may occur 1 year in 5
Amherst	May 12	May 21
Concord, Mass.	May 8	May 15
Fitchburg	April 28	May 18
Westboro	May 6	May 17
Williamstown	May 2	May 11
Middleboro	May 12	May 23
New Bedford	April 14	April 23
Blue Hill Observatory	April 28	May 7
Concord, New Hampshire	May 7	May 16
Burlington, Vermont	April 29	May 8
Kingston, Rhode Island	April 28	May 6
Hartford, Connecticut	April 23	May 4

A difference of as much as 8° has been recorded at different elevations in the University Orchards during a single night. If a frost follows a period of weather favorable for rapid growth more damage is caused than if the same temperature follows a period of cool cloudy weather. Also, more damage results from a given temperature when the humidity is low than when it is relatively high.

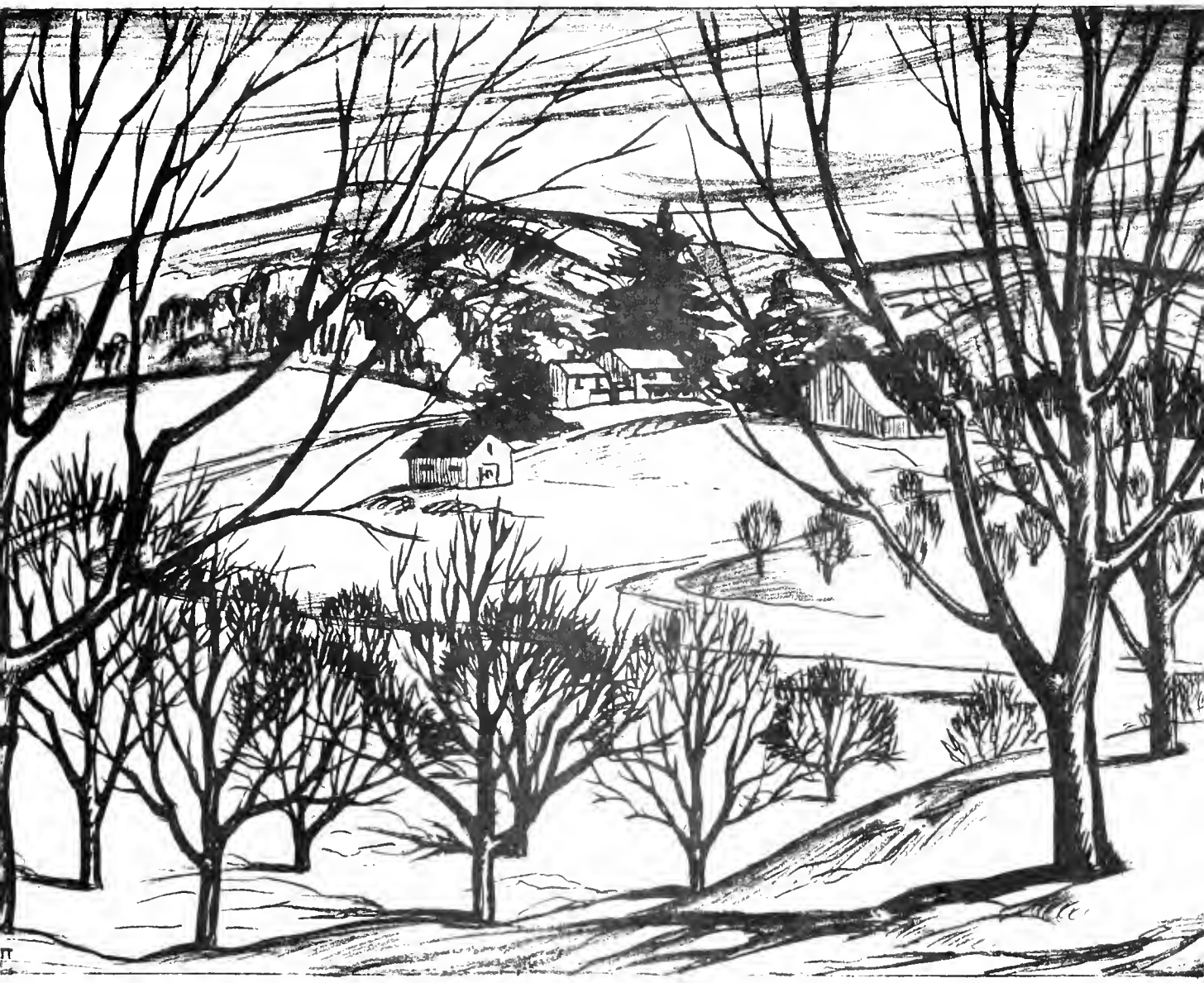
- - - - - - - - - - - - - - - - - - - -

Growers Urged to Keep Simple Spray Record. Any commercial apple grower in Massachusetts may obtain a form for recording weather conditions and the details of the spray and dust program by contacting his county extension office. Just ask for a Spray Record Card. These cards provide space for noting rainfall, but stages, temperature and materials used. Data of this kind will be of special interest to prospective members of the Red Apple Club.

- - - - - - - - - - - - - - - - - - - -

Fruit Notes

MAY 31, 1949



Prepared by the Departments of Pomology, Entomology, and Botany, and
Other Staff Members
Compiled by W. H. Thies, Extension Horticulturist

CONTENTS

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

COUNTY AGENT'S CORNER

Franklin County (Observations reported by D. T. Thayer)

Norman Ellms of Dry Hill Orchard in Millers Falls undertook something new and different at pollination time. As far as we know, for the first time in the East, a shotgun was used in pollinating. As one grower remarked, "The shotgun is generally employed following pollination."

Ellms fired Golden Delicious pollen into the tops of a virtually solid block of Macs in an attempt to set a crop. Cortland grafts were introduced into the block last year, but were not cross pollinating this season.

The pollen, loaded in regular sporting cartridges (with reduced propellant charge and special wads) were flown from Wenatchee, Washington, in refrigerated containers to reach here in highly viable condition.

Three rounds were fired into each tree at different angles and ranges. Cloth "spotters" were rigged in the tree to act as aiming points, and as reference to check fruit setting in relation to pattern of pollen dispersion. The gun was a 12 gauge sporting arm of ancient vintage.

One tree in the block was completely enclosed with tobacco cloth while in the pink stage as a check. This tree was shot under the cloth at bloom and no bees were observed inside. Ellms has reported apples set on the bagged check tree, but no count was made.

There seems to be little research available on shotgun pollination. We have shot into many conifers and several deciduous species at the elusive partridge and never found it too effective. It would be quite embarrassing if our Dinah dog began to point Mac trees.

Preston Townsley and his father, Fred Townsley, orchardists up in Ashfield's Apple Valley, spend considerable time during the winter months getting out logs from their managed timber lots. As soon as spray time comes, they lay by their saw and reach for the spray gun. Preston says there are times when they feel like sawing right through the spring.

Folks travelling the Mohawk Trail claim to hearing cries of "Timber" from Roger Peck's Valley View orchard in Shelburne. Roger claims to be the "loggiest" fruit grower in this county. He's pruned severely, i.e. one foot from the ground, a good many thousand feet of fillers, crowded trees during recent years. Seems a lot more of our orchards could stand a selective cutting.

Over recent months a columnist in the Boston Sunday Herald has been bemoaning the gradual passing of some of the oldtime varieties. This is quite a popular sport with some of our more earthy writers and some other rank sentimentalists who don't know a Hubbardston from a door knob.

Well, Aubrey Amidon, Jr., of South Halifax, Vermont, can just about cover any variety you want to bet. He says he has "50 or 100" different varieties and services a special demand trade for the odd ones.

Deer have always been one of his biggest pest problems. Until recently, lead applications in the cover sprays, fall and winter dormant, have been used. The lead has been put on with a .30-.30, we understand. Now, through the cooperation of the State, Aubrey has erected a woven wire fence 8 feet high around the most browsed blocks.

Part of the Amidon orchard is in Colrain, Massachusetts, the block we took the Red Apple Club sample from. Aubrey gets the latest dope from both Vermont and Massachusetts. When Doc Boyd warns of an infection period and Aubrey wants to go trout fishing, he checks the Vermont message, and vice versa. Last time we were up there, Doc Wheeler couldn't find any red-banded leafroller. Said he doubted if they could find their way up to Amidon's.

If there is any fruit grower in the state who has never heard the ancient wheeze about the apple expert who could tell apple varieties by taste while blindfolded, come on up to any twilight meeting in Franklin County. Someone is sure to tell it every time.

- - - - - - - - - - - - - - - - - - - -

Hampden County (Observations reported by J. N. Putnam)

Hampden County orchardists met recently at the Wyben orchards in Westfield. This orchard is operated by Mr. E. S. Hartley and his son, George. One interesting feature of this meeting was a visit to a young orchard established by the Hartleys beginning fifteen years back. The land was originally covered with woods, and the Hartleys cut several years' supply of firewood from the lot, and then began setting trees after partial clearing of stumps. Continuous work has been done since that time in picking up stones and discouraging sprouts. Ed Hartley states that this is the hardest way to do the job of establishing a new orchard. Most growers in this area who have tried this method now agree that it is better to postpone planting a year or two, and in the meantime do a fairly complete job of land clearing.

A demonstration of the Buffalo turbine sprayer was put on at this meeting. Growers were very much impressed with its performance. It looks very promising for future use.

Frost damage in Hampden County apple orchards was apparently not serious. The crop was threatened several times and two growers burned oil in five gallon cans to heat their orchards. One man started his heating with crankcase oil, refilling with furnace oil. The other used furnace oil entirely.

Scab control up until May 19 had been excellent. European red mite are more numerous than is usual for this time of year.

* * * * * * * * * * * * * * * * * * * *

SELECTION OF FRUIT VARIETIES FOR HOME AND LOCKER FREEZING

During the past few years considerable attention has been given to the suitability of fruit varieties for freezing in many of the State Experiment Stations. Such studies have been carried on at the University of Massachusetts by the Department of Food Technology in cooperation with the Department of Pomology. A number of varieties of apples, blueberries, cherries, currants, peaches, pears, plums, raspberries, and strawberries grown at the University have been frozen each year over a five-year period. The frozen products were evaluated for quality on a basis of consumer acceptability.

From these tests the following fruit varieties among others were found to be particularly satisfactory for home or locker freezing:

Apples: Baldwin, Cortland, Greening, Northern Spy. The McIntosh and Wealthy were good if given a calcium treatment to prevent excessive softening.

Blueberries: Most cultivated varieties, as well as wild blueberries.

Cherries (sour): Montmorency.

Cherries (sweet): Schmidt and Windsor.

Currants: All varieties tested.

Peaches (yellow): Elberta, Halehaven, Ideal, J. H. Hale.

Peaches (white): White Hale.

Pears: Freezing not recommended as frozen quality is generally poor.

Plums: Albion, Burbank, Elephant Heart, Formosa, Monarch, President, and Red Wing.

Prunes: German Prune, Imperial Epineuse, Italian Prune, Stanley.

Raspberries (black): Bristol.

Raspberries (purple): Columbian, Sodus.

Raspberries (red): Chief, Cuthbert, Latham, Lloyd George, and Viking.

Strawberries: Catskill, Crimsonglow, Culver, Dorset, Fairfax, Fairpeake, Midland, Redheart, Senator Dunlop, Sparkle.

There are other varieties of the above fruits which would usually yield a reasonably satisfactory product for home freezing. However, in the case of fruits

it would appear that as a general rule it may be assumed that any variety, if of good fresh eating quality, will be satisfactory when frozen. Pears are an exception because they are not well adapted for freezing and the resulting product is usually disappointing. For the best quality frozen fruits it is also important that only top quality raw material harvested at the optimum fresh eating stage of maturity be frozen. It is likewise important that recommended freezing and packaging procedures be followed. These may be found in the Massachusetts Agricultural Experiment Station Bulletin No. 437 (revised) - "Home Freezing in Massachusetts." This bulletin will be available for distribution in the near future.

William B. Esselen, Jr.

* *

MONTHLY RODENT CONTROL NOTES

Young fruit trees, planted as replacements in old tree sites, are often retarded in growth, due to being partially or completely girdled by mice. This may be prevented if care is taken, at the time of planting, to carefully fill in the hole left by the removal of the original tree. Before a young tree is planted, the ground around the area where the original tree stood should not only be filled in but trampled down firmly, either by running over it with tractor wheels, water soaking, or by other means. This will give a firm, level ground area in which to plant the new tree. When this is not done, as so often is seen, mice are furnished an ideal site for reproduction. If the ground is left uneven, mice may construct runways that will furnish routes of travel for several future generations of mice. Placing mulch over the uneven area usually forms pockets where mice may work in perfect safety.

When grubbing around newly set trees, and particularly those set directly in old tree sites, sod should not be left in such a manner as to furnish additional mouse nesting and feeding sites.

Another reason for keeping a level ground area around newly set trees is that a better job of mowing may be done. Meadow mice are definitely easier to control in an orchard that maintains a smooth orchard floor. The month of June will find many orchardists cutting the first growth of grass. Some will let the grass lie where it fell; others will place it around the trees in a ring; and others may haul in extra mulch. Mulching is recognized as an excellent orchard practice and should not increase the mouse hazard if done properly.

If an effective mouse control program is to be carried out, then the following DON'TS are in order:

(1) Don't place mulch directly against the tree. Place it at least three feet from the tree base.

(2) Don't place a light, fluffy mulch covering, but apply enough so that the mulch will settle compactly.

(3) Don't place mulch around newly set trees that are in a rough area such as caused by the removal of a previous tree. Fill in and pack down the area before applying mulch.

(4) Don't leave the grass around young trees unmowed for the entire season, particularly in areas which cannot be reached with the mower. After mowing has been completed, mice tend to move toward the unmowed areas. If an unmowed area exists around a tree base, mouse damage may occur before the fall baiting program begins.

Most orchard owners dislike the expense and the tedious labor involved in carrying out a successful fall baiting program. However, this work can be greatly reduced by good orchard sanitation practices. Much of this work can be accomplished during the months of June and July -- such as good mowing, clean tree bases, removal of brush piles, and leveling of uneven orchard floor areas.

-- Carl B. Henry
Assistant District Agent
Conn., Mass., Rhode Island

* *

NOTES ON FARM INCOME, FARM PRICES, AND FARMER-WORKER RELATIONSHIPS

Massachusetts Farm Income - The cash receipts which Massachusetts farmers received for their products from January to March 1949 were slightly less than in the same months last year. Total receipts were $42,320,000 compared with $44,571,000 last year, a decrease of a little over 5 percent.

Falling Prices - Many Massachusetts farmers have never operated a farm on a falling price level. Management problems on a falling price level are different than on a rising level. Increasing efficiency is one of the best ways to hold risks down and to insure profits. Plan farm jobs carefully, think them through and try to do them in the easiest and cheapest way possible.

Farmer-Worker Relationships - Massachusetts farmers employ most help during the summer and fall months. It takes considerable skill on the part of the farmer to get the best results from the available help. Proper guidance and handling are important. This requires kindness, tolerance and patience.

When giving instructions -

1. Tell, show, illustrate and explain.
2. Take up one point at a time.
3. Stress key points.
4. Point out safe working habits.
5. Let the worker do the job.
6. Ask him questions.
7. Let him ask you questions.
8. Check his work to make sure he is working correctly.
9. If necessary to reprimand begin with a question -- let him tell his story first.
10. Don't be afraid to praise a job well done.

- - - - - - - - - - - - - - - - - - -

The Massachusetts Farm Situation - Prices for farm products began to decline earlier and have dropped farther than prices for most other commodities. The peak in farm prices in Massachusetts was in June 1948. By February 1949, prices received by farmers have dropped about 12.5 percent.

Prices paid by farmers - including interest and taxes, reached a peak in January 1948. They changed little during the first nine months of the year and have since dropped only about 2 percent.

This does not mean that farmers are headed for a depression. It is more likely to mean that the "bloom is off the boom."

What to do about it

1. Plan conservatively with emphasis on increased efficiency.
2. Feed liberally to take advantage of favorable feeding rations.
3. Fertilize adequately -- fertilizer and lime are still among the best buys.
4. Buy only machinery which will reduce costs or increase output.
5. Pay debts -- a dollar is still worth a dollar when paying debts.

-- Roy E. Moser

* * * * * * * * * * * * * * * * * * *

PONDS FOR THE FRUIT GROWER

Interest in pond construction in this state has steadily increased since the establishment of the first soil conservation districts. This was a little surprising since Massachusetts like other New England States is comparatively well supplied with natural lakes, ponds, streams, and springs. Moreover, the annual rainfall is generous and generally well distributed, although periods of drought within the growing season are not uncommon. Fruit growers have a particular interest in farm ponds as a source of water for spraying and in some cases for irrigation.

The requests which have come to districts for assistance are evidence that farmers need more ponds than nature provided. Two hundred and sixty-two farm ponds have been planned, and of these, 69 have been constructed. Pond construction is becoming a major district activity. Technicians of the Soil Conservation Service assist the farmer in picking a suitable site, and Service engineers design the pond, all of which may require considerable time. The farmer pays the cost of construction.

Enough data on the construction of ponds in this state have now been accumulated to permit the drawing of the following, in some cases tentative, conclusions: (1) Per unit of storage capacity, the dugout type of pond is cheaper than the breastwork or dam type. (2) Dugout ponds can be built more cheaply with a heavy bulldozer than with a dragline. Dragline costs approximate those with the lighter bulldozers. When a dragline is used for excavation it is still

necessary to use a bulldozer to spread the soil. (3) Dugout ponds having capacities between 50,000 and 150,000 gallons can be built with a heavy bulldozer under favorable conditions for $75 to $150 under present costs.

The Soil Conservation Service is primarily interested in pond construction as a means toward the conservation of soil and water. The pond should play a part in a complete farm conservation plan. However, ponds may in many cases serve different useful purposes including a source of water for irrigation, fire fighting, fish, and recreation. A multiple-purpose pond returns most on the investment.

-- A. B. Beaumont

* *

Small Fruits Day, June 16. Interested in strawberries and other small fruits? Then you may want to take in the annual session at the Cold Storage in Amherst, June 16, beginning at 10:30 a.m. Among the speakers are Dr. A. S. Colby of Illinois who will discuss developments in strawberry growing. There will be other speakers, exhibits, question period, in fact something to interest every grower of small fruits.

* *

Red Apple Club. The spraying season is about at the halfway mark. If you have done a good job of controlling pests thus far and if your set of fruit shows promise of at least 400 bushels per acre, you have a good chance of qualifying for membership in the Red Apple Club. An opportunity to apply for inspection will be offered every commercial grower in August. In the meantime, everyone with "honorary fraternity" ambitions should keep a careful spray record, and otherwise strive to qualify in the "three high hurdles" which involve score, grade, and yield.

* *

Deer Repellent. The new repellent mentioned recently in FRUIT NOTES is being tested in several Massachusetts Orchards this season. In at least 4 orchards highly susceptible to damage, treated trees will be tagged to observe whether or not further damage occurs. This material is said to be so unpalatable that deer after nibbling treated leaves spit them out promptly.

* *

Chemical Thinning. There is some evidence that the hormone, naphthalene acetic acid, is effective in apple thinning even when applied as late as early June. Growers interested in trying this material in a small way should make the application before the so-called "June drop." Four weeks after petalfall may be about the limiting date. Full details are available from your county extension office or the Department of Pomology in Amherst.

* *

ORGANIC PHOSPHATES

TEPP and Parathion

These two materials are proving useful against certain orchard pests in many parts of the country including Massachusetts. Since both of them are highly poisonous to warm-blooded animals, let's learn to handle and use them safely.

These organic phosphates differ from wettable DDT and Lead Arsenate in that they are absorbed through the skin. The manufacturers of tetraethyl pyrophosphate and Parathion spray materials recognize this fact and give complete directions for handling the TEPP liquids and Parathion powders. These directions and precautions are for your safety.

Residues of TEPP are completely non-toxic after several hours and need not concern anyone. Residues remaining from Parathion sprays lose their toxicity to insects after a few days and are neglible on food products after 30 days at the dosages and number of applications which seem necessary for insect control.

Both materials are employed in the orchard in very dilute concentrations. However, spray operators should not be allowed to wear spray soaked clothing nor to be exposed to spray drift for several hours without washing the hands and face thoroughly. Arrange the clothing to prevent drip down the back of the neck. Provide a means for thorough washing of hands and face and limit the hours one operator is exposed to excessive drift of spray mists.

TEPP has been a very effective material against mites and aphis this season. Parathion is a good miticide and in addition may prove very useful against summer Bud Moth and second generation Red-banded Leafroller. It is being used by some growers to control curculio on peaches.

-- Ellsworth H. Wheeler

* * * * * * * * * * * * * * * * * * * *

Why Some Spray Programs Fail. More spray programs "miss the mark" because of poor coverage than because the wrong materials are used. Almost any brand of material will give satisfactory results if properly applied. Failure to cover all parts of the trees is the most common mistake of the spraying season.

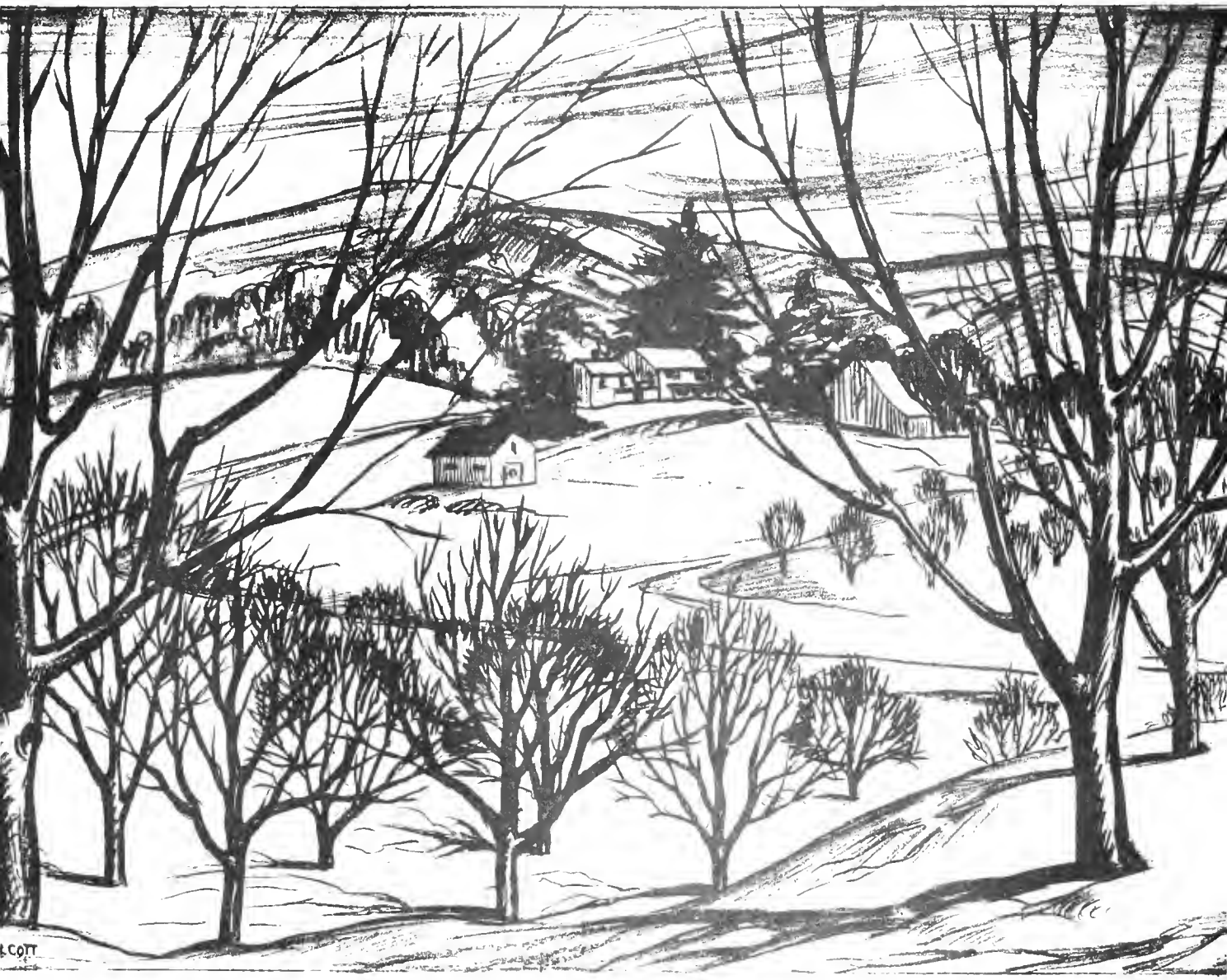
* * * * * * * * * * * * * * * * * * * *

Apply Lime Whenever Convenient. Liming the soil is one operation which may be done almost any month in the year. Unlike many other orchard jobs, spraying, fertilizing, thinning, mouse control, etc., which are so dependent on careful timing, there is literally no "closed season" on liming. Maybe that's why some folks put it off indefinitely. But in so doing they are losing out on one of the basic things in soil improvement.

* * * * * * * * * * * * * * * * * * * *

Fruit Notes

JULY 3, 1949



Prepared by the Departments of Pomology, Entomology, and Botany, and
Other Staff Members
Compiled by W. H. Thies, Extension Horticulturist

CONTENTS

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

CHOKECHERRIES - ELIMINATE THEM NOW

The X-disease or yellow-red virosis, a virus disease of peaches, is apparently becoming a real threat to the peach industry in some sections of the state. The alternate host of this disease is the chokecherry which grows wild in abundance over most of the state. Since this disease travels rapidly from chokecherry to peach but very slowly from peach to peach, it is necessary to remove all chokecherries to a distance of 400 to 500 feet from the peach orchard to be reasonably sure of freedom from this disease. Removal of chokecherries is the only known control at present.

Some growers who have peach orchards next to wooded areas heavily infested with chokecherries find it practically impossible to eliminate them from such areas. This emphasizes the necessity for great care in selecting a peach site. Setting peaches next to an area infested with chokecherries is inviting trouble. If it is possible the chokecherries should be eliminated before the peaches are planted. If they can't be eliminated another site had better be selected. Where it is at all possible, chokecherries should be eliminated promptly around orchards already set.

The chokecherry is a persistent tree. If it is cut off, many sprouts will develop from the stump. If it is dug out, any root pieces left will send up sprouts. The only sure way of killing chokecherries is by the use of an herbicide. The most effective and safest of these is Ammate. It is used at the rate of 1 lb. per gallon of water. Treatment is most effective if the spray is applied when the plants are growing rapidly but any time from late June to mid-August appears satisfactory. The foliage of the chokecherries should be thoroughly wet with the spray and mowing postponed until the following season. Ammate is less effective in shaded areas so that in such places one or two retreatments may be required.

Since Ammate is not a selective spray, it must be used around desirable plants with care. Peach trees are quite sensitive to it so that it should not be used in the orchard; only around the orchard.

Ammate is quite corrosive on metals. It should not be left in spray equipment longer than necessary and the equipment needs to be washed thoroughly immediately after use. Adding some spray lime to the wash water helps. It is also desirable to wash the outside of the sprayer to remove any material which has slopped over.

-- John S. Bailey

* * * * * * * * * * * * * * * * * * *

BLUEBERRIES FOR HOME AND LOCKER FREEZING

Both cultivated and wild low bush and high bush blueberries have been found to be quite satisfactory when frozen. Under some conditions trouble has been experienced with a toughening of the skins during freezing and storage. The exact cause of this condition is not known. However, it has been found that in many cases blanching prevents the development of tough skins. For blanching the blueberries should be handled in one or two pound amounts. They may be blanched in either live steam or hot water for from 30 seconds to one minute, depending upon the tenderness of the fruit. Firm blueberries should be blanched for one minute. In blanching the fruit may be placed in a sieve and dipped into boiling water or exposed to live steam. During blanching the fruit is softened and some color and juice will escape. Immediately after the blanching period the blueberries should be cooled by holding them in cold water for several minutes.

Several different procedures for freezing blueberries have been found to be satisfactory.

1. If the blueberries are blanched they may be frozen without added sugar or dry sugar may be mixed with them at the rate of one pound of sugar to five or six pounds of fruit.

2. Fully ripe berries may be mixed with dry sugar at the rate of one pound of sugar to five or six pounds of fruit. The fruit should be stirred gently until sufficient juice comes out of the berries to dissolve the sugar.

3. Fully ripe berries may be packed in containers and covered with a cold sugar sirup (a 40 per cent or medium sirup is satisfactory for most people).

4. The berries may also be packed dry without any sugar.

The selection of which method of freezing to use should be based on the ultimate use of the frozen blueberries and the tendency of the skins of the fruit to become tough (on basis of previous experience in freezing blueberries of particular varieties in a given area).

During the past five years a number of different varieties of cultivated blueberries, grown at the University of Massachusetts, as well as wild blueberries have been frozen. The quality of the frozen berries has been evaluated on a basis of flavor, texture and color. In general, all of the blueberry varieties tested were considered as being of very good quality. Slight variations in acidity and flavor were observed among the different varieties, but it was a matter of individual taste as to which variety was preferred. The varieties of blueberries tested include: Cabot, Concord, Jersey, Pemberton, Pioneer, Rancocas, Rubel, Scammell, Stanley, Wareham and wild high bush berries.

-- William B. Esselen, Jr.

* *

No issue of FRUIT NOTES was prepared during June.

* *

When Raspberry Leaves Turn Brown - We frequently see the leaves on an occasional raspberry cane turning brown during June and wonder whether an insect or disease is responsible. The difficulty generally dates back to the previous year when Spur Blight or Anthracnose infected the new canes. Spraying with Fermate during May helps to insure healthy productive canes the following season.

* *

LIMING ORCHARD SOILS

Why should an orchardist be interested in liming his soils, anyway? After all, a fruit tree is just a tree and who ever seriously considered applying lime to tracts of timber? Yes, a fruit tree is just a tree but we are asking it to produce a crop every year, not once in thirty or forty years. Consequently, we must give that tree the best soil environment that we can, to keep it at a high level of production. For that matter, we may someday lime and fertilize timber trees if the demand for forest products becomes sufficiently acute. About eighteen years ago, the writer visited some fertilizer trials with pine trees near Berlin, Germany and saw some very marked responses of timber trees to the use of fertilizers.

If we are interested in creating the best possible soil environment for the tree to grow in, what is the role of Lime? Lime plays many roles in the soil, both simple and complex. Following is a short discussion of some of them.

First, we say that we want to correct the soil acidity. Soil acidity is a bad thing and we want to get rid of it. Therefore, we want to add lime. While in a sense this statement may be correct, it does not explain all that is involved. Soils are acid because of an abundance of active hydrogen ions. We could also say that they are acid because of the absence of calcium, magnesium and some of the other basic elements. Actually, we are more concerned with the latter statement than the first. We are much more concerned about the absence of calcium and magnesium than we are about the presence of hydrogen. If the soil is well supplied with the basic elements, calcium and magnesium, the acidity as represented by active hydrogen will take care of itself. In fact, the hydrogen ion plays a very important and vital role in the nutrition of a plant. It has been shown that the hydrogen ion is not necessarily a villain and that some "acidity" is actually a good thing.

If liming is an essential operation in the treatment of acid orchard soils, how much lime should one apply? The conventional procedure is to take a representative sample of soil and have it tested for "pH". Recommendations are then based on the pH test. This procedure is satisfactory as far as it goes but there may be other points to consider besides pH when applying lime to orchard soils. The terrain of an orchard may be steep and it may be about as easy to apply two or even three tons to the acre as it is to apply one ton. Hence infrequent heavy applications of lime would be more practical than frequent light applications. Another factor for orchardists to consider is the acidifying materials used in carrying out the spray program. The most important acidifying element is sulfur. It takes about three pounds of limestone to neutralize one pound of sulfur.

Some orchardists using sulfur dust may use as much as five or six hundred pounds of this material per acre per year. To neutralize this quantity of sulfur 1500 to 1800 pounds of limestone would be required. Hence, an orchardist using large quantities of sulfur should make heavier applications of lime than one using much smaller quantities of such acidifying substances.

In any discussion of the liberal use of limestone on Massachusetts soils, the role of boron should be mentioned. For most plants to grow normally, a fairly definite balance of calcium and boron must exist in the soil. Since the natural supply of boron is fairly low in most Massachusetts soils, heavy applications of

lime may so disturb the Ca/Bo ratio that boron deficiency symptoms may develop. Boron deficiency symptoms have already been observed with many crops in this state, including the fruit crop. It would appear wise, therefore, to supplement most heavy applications of lime with a suitable application of borax.

The unprecedented drought this year has caused heavy financial losses to Massachusetts farmers but even the lining of this black cloud (or perhaps lack of clouds) has just a tinge of silver on it. Dairymen have never cured better hay and the land in orchards and elsewhere was never in better shape to receive a liberal application of lime. There should be no extracting of mired lime trucks from wet spots in the field this year.

-- William G. Colby

* * * * * * * * * * * * * * * * * * * *

COUNTY AGENTS' CORNER

(Observations reported by Lewis A. Norwood of Plymouth County)

It looks as if the mulching program in the State Farm orchard is paying off, especially during this dry spell. Wallace Pratt has an excellent crop and the leaves are large and of very fine color. Wally has had considerable trouble with Grape Cane Gallmaker in his vineyard this season. He has picked off $2\frac{1}{2}$ bushels of the galls and destroyed them. It is the worst infestation that he can remember. His method of pruning the Fredonia variety is working out very well. He has adopted a system which involves weighing the prunings and leaving proportionately more buds on large vines. In other words, the number of buds varies in accordance with the weight of the prunings. He looks forward to a good crop of Fredonias this season.

Dry weather has hit the strawberry crop in this section. George Rounds is cooperating with the Extension Service in a test planting involving 5 varieties, Midland, Fairland, Sparkle, Catskill and Howard.

The County is fairly free from Apple Scab. Some Scab, however, has been noticed in the tops of trees in one commercial orchard where a speed sprayer has been used. Minor refinements in spraying technique are apparently needed. Clover Mite has been observed in Plymouth County orchards in the past few weeks. There is also considerable Rosy Aphis damage especially on the Cortland variety. Ralph Baker plans to use a dormant D-N this fall to clean up this troublesome pest.

- - - - - - - - - - - - - - - - -

Essex County Fruit Growers Look Ahead (Observations reported by Calton C. Cartwright)

While some of our younger fruit growers would think twice before planting an orchard which they might think was for the benefit of the next generation, "Dean" Harry Seagrave, manager of Long Hill Orchards, Inc., West Newbury, set out a new peach and plum orchard last year and is now planning for an apple orchard to be set on the contour in 1950. "Bill" Thies said on his last visit to this orchard, "If our younger fruit growers had the enthusiasm and confidence in the future that our "Dean" (of 80 odd summers) has, our fruit industry would surely prosper."

Dr. Joseph Goodale owner of a large orchard in Ipswich is another active member of our "80 Club". Dr. Goodale spends a part of each day in his orchard and has a keen interest in pest development and control as well as other orchard problems.

Perhaps our older growers may have a foresight into the future. At any rate they are certainly helping to lead us forward.

Other orchards are taking definite steps to replace some of their older plantings. Archer Pierce, manager of Brooksby Orchards, Peabody, has just bulldozed seven acres of forest land adjacent to a two year old apple orchard. Apple trees will be planted on this new site next year.

Edward Kehoe and Winthrop Stacey, joint owners and operators of Merrihead Orchards, Merrimack, have cleared a four acre site and laid out a diversion terrace. This orchard will be planted with Peach trees next spring.

Harold Walker, President of the Essex County Fruit Growers Association, made good use of his bulldozer last winter when he removed a number of diagonal rows to alleviate crowded trees in his large orchards in Lynnfield.

* *

COMMENTS ON THE APPLE SCAB SITUATION

It seems strange why there should be so much apple scab following such a dry spring and summer. There were very few widespread or regional storms during the spring season that brought prolonged wetting periods. However, the records do indicate numerous sectional wet periods right on the border line in duration for primary scab infection as well as for secondary spread later on. Some of the wettings that favored infection in one part of the state were too short in duration to allow infection in other sections.

Orchard examinations during May and June indicate clearly that practically all sections of the state experienced one or two infection periods before bloom; some areas, at least one or two during the early cover spray period. The principal reasons for appearance of scab are the same as in any other year: failure either to time the protective sprays ahead of or during the wet periods, or to obtain thorough coverage. Early maturity of scab ascospores last spring and the moderate to heavy supply of primary inoculum contributed materially to the development of scab before, during, and shortly after bloom wherever protection was not adequate during the wet periods.

Considerably more infection of fruit spur leaves and sepals occurred at pre-pink (April 13-14 and 18-19) and at pink (May 2-3 in high elevation orchards) than growers generally at the time suspected, or even realized until some time after the spots showed up. These scab spots were ideal sources for secondary spread during the infection periods on May 19-21, 22-23, 24-25 and 30-31.

In certain orchards the only scab now in evidence includes an occasional primary fruit spot together with some active or burned-out spur-leaf spots. Further primary infection as well as secondary spread was more or less

completely prevented. In other orchards, additional infections of terminal leaves and apples occurred during one or more of the four wet periods in May indicated above. A good many growers applied phenyl mercury sprays to eradicate leaf spots. In general, the acetate materials (Puratized Apple Spray and Tag Fungicide 331) were more effective than the lactate form (Puratized Agricultural Spray).

The apple scab situation in most orchards this year calls for a protective fungicide in all of the late season cover applications to protect foliage and fruit against secondary spread. Considering the amount of active scab in some orchards, additional dust or spray applications of sulfur may be needed during August, if wet periods sufficiently long to allow fruit infections are encountered. It has been found that wet periods of 40-45 hours are necessary during the first half of August to favor infection of McIntosh apples, and about 4 days for late August and early September.

-- Oran C. Boyd

* *

WHERE DO WE GO FROM HERE? - Evaluating the Newer Insecticides

Never in the last 25 years has the pest control program been in so great a confusion. New pesticides have been developed and have passed the preliminary screening tests with flying colors. Preliminary experiments have shown remarkably good results. Now they are being evaluated for local problems under local conditions. They must be standardized for practical application. Some of this confusion will be cleared up this season but not all -- science doesn't move that quickly. I know that there will be some questions next year which we cannot answer definitely.

Let us look at some of the problems. Superior oil seems best for control of winter red mite eggs but it is not satisfactory against rosy aphis. Dinitro sprays are excellent to combat aphids but even the butyl forms, such as DN 289 and Elgetol 318, were disappointing against red mite in some cases. With the increase of the two-spotted mite which spends the winter under bark and trash on the ground so that none of the dormant sprays are effective, a new treatment must be found. In experiments, Methoxychlor, Chlordane, and Parathion have given better control of the plum curculio than the currently used materials and no doubt the recommendations will be changed to make use of these advantages. Methoxychlor is favored.

A new insecticide called DDD or TDE has shown great efficiency for combatting the red-banded leafroller. It is available as a wettable powder and an emulsion and we have yet to learn which is more practical under New England conditions. Will the emulsion cause excessive residue at harvest or interfere with proper coloring of McIntosh? Does it give adequate control of codling moth and apple maggot when all three of these pests are present in July?

The most outstanding new insecticides are TEPP and Parathion. They kill practically all insects which come in contact with them. Both have given outstanding control of summer red mite. TEPP is an excellent aphicide and Parathion controls all apple insect pests well. Unfortunately, however, these materials contain organic phosphates which are violent poisons in the concentrated form. When diluted ready to use there is little danger when the precautions given by the manufacturer are followed. We would like to avoid such materials but their efficiency is so great that they cannot be ignored.

Unfortunately these new pesticides have been introduced for orchard use more rapidly than they can be completely evaluated for local conditions. Some confusion is unavoidable, but such is progress.

-- W. D. Whitcomb
Waltham Field Station

* * * * * * * * * * * * * * * * * * * *

ORCHARD INSECT CONTROL - Summer 1949

At this writing, early in July, Massachusetts apple growers must continue spray and dust programs designated to control Apple Maggot, second brood Codling Moth, Red-banded Leafroller and European Red Mite. Two-spotted Mite, Bud Moth, Leafhopper and Aphids also may require treatment in some orchards. These pests, even the more common ones, are not present to the same extent in all orchards and therefore, it becomes very important for each grower to know what insects or mites he must control. Judging by experiences in 1948 and by observations made in 1949, Apple Maggot, Red-banded Leafroller, Mites and Codling Moth head the list. The importance of Apple Maggot in your orchard must be based largely upon past history and the possibility of migrants from surrounding areas. If dropped, wormy apples can be found in your orchard during mid- and late July, then a second brood of Codling Moth is an August threat. Mites must be watched almost daily to detect their presence in serious numbers before yellowing or bronzing of the foliage occurs. Examine both sides of the leaves since damage by Two-spotted Mite shows first on lower surfaces. The Red-banded Leafroller is a serious threat wherever any sign of first brood activity on fruit can be found. Every apple grower should examine each block now to determine the extent of the first brood damage to fruit and leaves. Any first brood damage at all means even more serious damage from second brood (and even third brood this season). In general this pest is more prevalent in Massachusetts this year than in 1948.

Coverage and Sprays vs. Dusts - For Mites, Red-banded Leafroller and Bud Moth both surfaces of foliage must be treated regardless of the insecticide being used. For the latter two pests, especially the amount of insecticide applied to the under surface of the leaves makes the difference between success and failure. Don't guess -- know how well you are covering as the sprays are applied. For Codling Moth the fruit must be covered on all sides. Maggot control depends upon the presence of the insecticide on upper surfaces of foliage, all sides of fruit and on hedgerows and adjoining woods as well. Dusts may be depended upon for controlling Maggot, light infestations of Codling Moth and probably mites if very thorough. Dusts have a distinct advantage from the standpoint of residues at harvest. Dusts used to supplement a spray program are excellent for late Maggot and Codling Moth and help keep residues at a lower level. Sprays must be used to control Red-banded Leafroller successfully and are less expensive for materials where mites must be controlled in addition to other pests.

Timing - Apple Maggot flies will remain a threat until mid-August or even later if migrants into the orchard are a problem. Peak abundance normally should occur between July 10 and August 1. Second-brood Codling Moth larval entries should occur in greatest abundance during the first two weeks in August. Mites may appear

at any time but favorable conditions this year are causing the Two-spotted Mite to appear in serious numbers earlier than usual. There is still time this season for several generations of both European Red Mite and the Two-spotted Mite. To control the former now requires two successive sprays not more than 10-days apart regardless of what material is used. Since the Two-spotted Mite may complete a generation in even less time the interval should be reduced to 6 or 7 days (or 4 to 5 when temperatures are really high) where this pest is the major problem. Red-banded Leafroller moths of the first generation are now active and are laying eggs for the second and most destructive brood. First hatching of second brood larvae may be expected about July 12 or 15 this year and will continue on into early August. Two spray applications will be needed to control this pest -- the first, shortly after the first hatching occurs and a second when hatching is nearly complete or about 10 to 12 days after the first.

Materials - Of the standard recommended materials, lead arsenate has a longer-lasting effect upon Maggot and Red-banded Leafroller (second brood) than does DDT. Against Codling Moth the DDT is much more effective than arsenate. Where no special problem exists the 2-2-100 formula for the combination, or the 3-100 if lead arsenate is used alone, should provide adequate control of these pests if one assumes a thorough coverage of fruit and undersides of the foliage.

Parathion caused spotting of fruit on McIntosh and Cortland in both New York and Michigan in 1948 when used in July or early August treatments above 1/2 pound of 15% wettable powder to 100 gallons. At this concentration Parathion should control Mites, Bud Moth, and newly hatched Red-banded Leafroller. It will reduce Apple Maggot flies and Codling Moth but protection against them will not extend beyond a week. So far as is known Parathion may be used on other varieties at concentrations of 1 or 1½ pounds of the 15% wettable powder with correspondingly greater effectiveness.

Dichloro diphenyl dichloroethane or DDD or TDE is particularly effective against Red-banded Leafroller and is recommended as a substitute for DDT wherever this pest is a problem. DDD is about like lead arsenate for Codling Moth and similar to DDT against Maggot. DDD will control older Red-banded Leafroller larvae and thus may be used to clean up an infestation that seems to be getting out of hand. DDD is not effective against Mites.

DDD should be used at 1 pound of actual toxicant as a powder and at 1/2 lb. in liquids and is available in both wettable powder and liquid formulations. There is some evidence that the liquid formulation penetrates the webs better and therefore is more effective. It has the disadvantage of giving greater residues at harvest. Also there is a greater possibility of encountering injury to foliage or fruit owing to incompatibilities between liquids in the formulations and materials such as sulfur. The 50% wettable powders used at 2 lbs. to 100 gallons will control the Leafroller and lessen the danger of excessive residues at harvest time. If mites or aphids or both are problems at the time the Red-banded Leafroller starts to hatch, then Parathion used as indicated above, may be the logical material to include in a mid-July spray. This could be either the first or second application of the two needed for mite control. Omit the DDT if Parathion is employed, but include the lead arsenate for longer-lasting effectiveness. Where neither the Red-banded Leafroller nor Bud Moth are problems, TEPP or the summer DN's might well be used to control mites. DDD should prove far more effective than Parathion when used in a late July or early August spray against Red-banded Leafroller.

-- Ellsworth H. Wheeler

* *

BETTER YIELDS FROM FALL-SET STRAWBERRY PLANTS

Fall planting of strawberries has been compared for yields at the New York Agricultural Experiment Station with spring plantings of the same varieties. George L. Slate of the Geneva Station states "The fall-set beds have generally substantially outyielded the spring set beds, chiefly because of the better stand of earlier formed, and consequently larger runner plants." He finds that the silty clay loam at Geneva is in better physical condition in the fall. In the spring this same soil becomes tillable rather late, and in a wet spring planting is delayed too long for good growth.

The range of dates for fall planting was October 18 to November 15 and the dates for spring planting from April 21 to May 27.

The yields from fall and spring planting may be compared in the following table:

Table 1

Quarts per 25 foot plot of fall and spring planted strawberries.

1947 yields

	Date set	
Geneva Farm	10/18/45	5/2/46
Howard (Premier)	8.6 qts.	5.9
Catskill	8.1	3.8
Dresden	12.1	1.9
Culver	11.1	10.9
Mean of 13 selections	9.0	7.0

1946 yields

Geneva Farm	10/17/44	5/21/45
Howard (Premier)	9	4
Sparkle	12	7
Temple	16	8
Dorsett	12	4
Culver	14	16
Mean of 8 selections	12	8

Table 2

Number of runners per plant July 17, 1946

Variety	Date set 10/18/45	5/2/46
Howard (Premier)	11.8 runners	3.0 runners
Culver	11.3	4.4
Dorsett	9.8	.5
Fairfax	8.6	1.4
Catskill	5.1	2.1

Table 2 shows a striking increase in the number of runners per plant resulting from fall set plants. Several experiment stations have reported that the early formed runners are much more productive than those produced in late summer according to Dr. Slate. The fall set plants have more early rooted large crowned plants.

Fall Setting Pointers - One objection to fall planted strawberries is that they must be mulched two winters for one crop. Also, nurseries do not sell strawberry plants in the fall, so healthy vigorous home grown plants must be used. Soils should be selected which are not heavy, or inclined to be wet during the winter or which retard spring growth. Such soils may cause some heaving of plants even when mulch is applied.

-- C. G. Anderson

* *

FRESH FROZEN APPLE JUICE

E. F. Fitzgerald of Leominster treated the writer to some excellent apple juice a few weeks ago. He offers these suggestions: "In most communities there are quick freeze frozen food locker plants where fresh sweet apple juice can be frozen and preserved indefinitely. The juice is usually frozen in gallon jugs and placed in cartons for convenience in storing. Allow juice to settle and clear by leaving in kegs over night. Draw off in gallon jugs leaving one to one and a half inches at the top for expansion. Freeze as soon as possible.

"When thawing juice, thaw completely and shake well. Keep cold and serve cold.

"In order to have a good product, cleanliness is very important. Keep press clean. Scald knives and grinder before pressing and keep cloths sweet and clean. A good flavor and texture is obtained by using half Baldwins and half McIntosh. Use only sound, ripe fruit."

* *

Red Apple Club - Applications for Red Apple Club membership should be made through the County Extension Office. Any grower who thinks he has a chance to qualify this season should drop a line to his County Agricultural Agent indicating the approximate date of harvest. The County Agent will supervise the picking of an official 5-bushel sample to be inspected according to a carefully arranged plan. Applications must be in not later than September 1. Requirements for Red Apple Club membership were outlined in the April issue of FRUIT NOTES.

* *

What's On Your Mind?- We need suggestions concerning topics to be covered in FRUIT NOTES. A post card will do the trick.

* *

Fruit Notes

AUGUST 30, 1949

Prepared by the Departments of Pomology, Entomology, and Botany, and Other Staff Members
Compiled by W. H. Thies, Extension Horticulturist

CONTENTS

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

CONTROL OF PRE-HARVEST DROP OF APPLES

As you all know, McIntosh is a variety which is outstanding in its susceptibility to pre-harvest drop. This drop is usually more severe on trees which are high in nitrogen due to heavy applications of commercial nitrogen fertilizers or mulch. Also trees which have poor foliage due to the activities of mites and other insects or as a result of frost, are subject to much heavier fruit dropping than trees with healthy foliage.

Materials for delaying pre-harvest drop in the Northeast consist of naphthaleneacetic acid type materials and have been in general use for 8 or 9 years. It is possible that we may have other materials shortly which may be superior to any material now available, but they are still in the experimental stage. These naphthaleneacetic acid type materials should be applied as soon as the first sound fruits commence to drop. Apples which have insect damage, scab, or are lopsided from lack of seeds should be disregarded; they will drop anyway. It may be desirable for a grower to clean up drops under a few typical trees in advance so that he can follow the drop daily and determine accurately when the first sound fruit has commenced to drop. Timing is extremely important. An application put on too early or too late is apt to give very disappointing results.

Most materials are put up so that 4 ounces of the material per 100 gallons will result in a 10 parts per million concentration (single strength). An application of this concentration may be expected to delay drop about 7 days. In order to delay drop 10 to 12 days, a second single strength application may be necessary 5 days after the first one. The use of 2 or 3 times this dosage (double and triple strength) may be effective up to 10 to 12 days, with only one application. A 0.1% dust is equivalent to a single strength spray. Applications put on in warm weather will become effective somewhat sooner than applications put on in cool weather. Under severe drought conditions, such as we are now experiencing, the hormone may be ineffective. A heavy rain will be necessary in many orchards before harvest in order to supply needed water, or the material may be of very little value in delaying drop this year.

Thoroughness of application is, of course, important. It is necessary that the foliage be well soaked with spray since it is through the leaves that the material is absorbed. Wetting of the stems of the fruit is not of primary importance, as once supposed, since it has been found experimentally that injections or applications of this material to the foliage alone are effective in delaying the drop.

-- F. W. Southwick

* * * * * * * * * * * * * * * * * * * *

Pre-Harvest Suggestions for the Apple Grower.

(1) Observe McIntosh drop daily on a few trees to determine time for hormone application.
(2) Check supply and condition of picking equipment, - ladders, picking, containers, boxes, etc.
(3) Smooth and otherwise level orchard roads to prevent bruising of fruit.
(4) Recruit and train supervisors of picking crews.
(5) Observe where your best and poorest fruit is produced as a guide to your pruning, mulching, spraying and thinning program in 1950.

APPLE MARKETING (An interesting analysis of the apple marketing situation is here presented by Fred E. Cole, Extension Marketing Specialist. His conclusions covering a 25-year period deserve careful study.)

A GROWER SURVEY OF SELLING METHODS

Fifty-two questionnaires were sent to the directors of the Massachusetts Fruit Growers Association and Red Apple Club members. Forty-six replies were received and tabulated. The following two tables show the different sales methods used and the extent of use of each method as reported by these growers for their 1948 crop. These crops varied in size from 320 bushels to 75,000 bushels and averaged to be 12,496 bushels.

Method of Sale (Arranged in order of Amount)

34.0 % delivered to commission merchant for sale growers' account.
8.7 % delivered country storage for sale by storage operator.
6.7 % sold to large chain stores -- delivered their warehouse.
6.0 % sold to consumer over roadside stand.
5.5 % sold - other.
5.3 % sold to consumers from storage or packing shed.
5.3 % sold to peddlers from packing shed or storage.
5.1 % delivered to city storage for sale by commission merchant.
4.2 % sold to manufacturer of apple juice, apple cider or vinegar.
2.7 % sold to baking concerns.
2.6 % sold to consumers, "gift" packages, parcel post or express.
2.5 % sold to retail stores at the store.
2.1 % sold to country point buyers - delivered to buyer at orchard.
1.5 % sold outright to storage operators.
1.5 % sold to retail store, from packing house or storage.
1.4 % sold to roadside stands operated by others.
1.3 % sold to consumers at their homes in town or city.
1.0 % sold to consumers as apple juice or cider.
.6 % sold to consumers who picked them up - drops.
.6 % sold to slicers, canners, freezers or other processors.
.5 % sold to large chains -- delivered their retail store.
.5 % sold as juice or cider to retail stores or other wholesale.

--

Method of Sale (Arranged in order of Number of Users)

29 % sold to consumers from storage or packing shed.
27 % sold to manufacturer of apple juice, apple cider or vinegar.
26 % sold to peddlers from packing shed or storage.
19 % delivered to commission merchant for sale growers' account.
18 % sold to consumer over roadside stand.
17 % sold to consumers, "gift" packages, parcel post or express.
16 % sold to retail stores at the store.
15 % sold to roadside stands operated by others.
11 % sold to large chain stores -- delivered their warehouse.
11 % sold to consumers as apple juice or cider.
10 % sold to retail store, from packing house or storage.

Method of Sale (Arranged in order of Number of Users) (continued)

9 % delivered to city storage for sale by commission merchant.
9 % sold to consumers at their homes in town or city.
8 % delivered country storage for sale by storage operator.
8 % sold to country point buyers-delivered to buyer at orchard.
8 % sold to baking concerns.
7 % sold to large chains -- delivered their retail store.
5 % sold outright to storage operators.
5 % sold as juice or cider to retail stores or other wholesale.
5 % sold - other.
4 % sold to slicers, canners, freezers or other processors.
4 % sold to consumers who picked them up -- drops.
4 % sold to consumers at factories or other places of employment.

STARTING PRICES OF MCINTOSH APPLES

The starting price for the season is established in large part by the size of the crop and the buying power of consumers.

Mr. Edwin C. Stillwell gave the following factors as important in establishing price for perishable commodities in a talk at the Cranberry Marketing Conference on March 17 at Wareham: (1) Supply,(2) Quality, (3) Nature of the product, whether basic or luxury, (4) Extent of consumer acceptance, (5) Supply and price of complementary products, (6) Supply and price of competing products, (7) Degree of sales organization within the industry, (8) Whether or not the trade made money in the previous season, (9) Current, old crop prices, (10) General buying power.

Mr. Stillwell explained the item of "supply" covered place and availability of supply as well as quantity. He also stated that "quality" had particular reference to the quality available to consumers. He made no attempt to list his factors in order of importance. In fact, he stated that different factors would have different values in different years.

The October 15 price is used as a "starting price" of the storage season in these studies of apple marketing. This is the price arrived at after 3 or 4 weeks of trading in the harvest period.

The following table shows: (1) October 15 McIntosh price for U.S.Fancy 2 1/2" and up in dollars; (2) Total Massachusetts apple production in terms of the 1938 crop. 1938 equals 100.

Starting Wholesale Price of McIntosh in Boston on October 15, over 25-year period, -- 1924 to 1948

Year	Oct. 15 McIntosh Price U. S. Fancy 2 1/2 up	Mass. Apple Production Index 1938 = 100
1924	2.87	95.0
1925	2.62	92.2
1926	3.00	123.8
1927	2.50	74.6
1928	3.75	81.3
1929	2.87	73.0
1930	1.87	131.7
1931	2.12	51.5
1932	1.25	117.4
1933	1.25	116.8
1934	1.87	50.9
1935	1.37	85.8
1936	2.00	61.5
1937	1.17	124.4
1938	2.00	100.0
1939	.92	132.7
1940	1.50	115.2
1941	1.80	116.7
1942	1.37	159.5
1943	3.12	104.5
1944	2.87	145.4
1945	4.35	21.8
1946	3.75	93.8
1947	3.00	134.4
1948	2.87	102.9

SELLING PLANS FOR MCINTOSH APPLES FOR 1949

Six hundred sixty-nine thousand bushels (669,000) of stored McIntosh sold for less money in 1947-48 than five hundred eighty thousand (580,000) bushels of stored McIntosh brought in 1948-49.

A study of the marketing season for twenty-five years beginning with 1924 and ending with 1948 shows several important things for McIntosh prices. (1) All twenty-five years were different. (2) 1947 had the greatest loss in selling price between October 15 and March 15 ($3.00 -- $2.37). (3) 1948 had the greatest gain in selling price between October 15 and March 15 ($2.87 -- $4.50).

It may be safe to assume that every year is different. That it would be rare indeed if all of the factors entering into price would be the same in any two years. A careful study of the factors in play in September, 1949, would seem to be in order. A very careful watch of what happens in the retail stores and over the roadside stands during the price-testing harvest period ought to be of help.

At least this year the growers have apples to sell and, in general, of excellent quality in so far as can be determined at the time this is written.

Many growers will consider it good judgment to follow a safe and sane program of orderly marketing. The hardest part of an orderly marketing program comes when it is hard to move the quantity which should be moved in a given marketing period.

The following table showing three things: (1) Average price of McIntosh apples, U. S. Fancy 2 1/2" and up for twenty-five years by two week intervals from September 15 to April 15. (2) Price for similar periods in 1948. (3) Price for similar periods in 1947. Percentages are included to facilitate comparison. The table tells its own story.

Seasonal Wholesale McIntosh Price Changes in Boston, Sept. 15 to Apr. 15

	25 year Average		1948		1947	
	Price	% of Oct. 15	Price	% of Oct. 15	Price	% of Oct. 15
Sept. 15	$2.24	96%	$2.75	96%	$4.25	142%
Oct. 1	2.22	96%	2.62	91%	2.87	96%
Oct. 15	2.32	100%	2.87	100%	3.00	100%
Nov. 1	2.38	103%	3.12	109%	3.37	112%
15	2.45	106%	3.00	104%	3.25	108%
Dec. 1	2.51	108%	3.12	109%	3.00	100%
15	2.53	109%	3.12	109%	3.00	100%
Jan. 1	2.54	109%	3.25	113%	3.00	100%
15	2.53	109%	3.50	122%	3.00	100%
Feb. 1	2.60	112%	3.62	126%	3.00	100%
15	2.64	114%	3.62	126%	2.75	92%
Mar. 1	2.70	116%	4.50	157%	2.62	87%
15	2.69	116%	4.50	157%	2.37	79%
April 1	2.50	108%	5.00	174%	2.25	75%
15	2.51	108%	5.00	174%	1.75	58%

-- Fred E. Cole

* *

CONSERVATION PRACTICES ON A FRUIT FARM

(The following story prepared by Wilbur F. Buck, Hampshire County Assistant in Conservation, is a good example of soil-building and reorganization on an old New England farm.)

The last house on Old Bay Road in Amherst is the home of Ernest Markert, progressive fruit grower and five-time chairman of the Amherst AAA Committee. Ernie's modern cold storage plant and up-to-date farming methods contrast sharply with his dwelling -- a historic landmark of stage coach days.

Dogged determination and plain hard work have been the formula for the success of this orchard. Ernie is a very modest individual and is reluctant to talk about the many handicaps he has had to overcome. The story of the farm in its present high state of productivity is largely the story of Ernie himself.

Mr. Markert, a native of Holyoke, graduated from Stockbridge School of Agriculture, a part of the University of Massachusetts, in 1926. He still has strong ties with both his fraternity and the University. His early employment found him first on the Conyers Farm in Greenwich, Connecticut, and then as manager of the Curtis Orchards in Marlboro, a large commercial operation. In 1941, Ernie purchased his present farm which comprised 100 acres, nearly all of which was in orchard, plus a cold storage plant.

He lost no time in his efforts to rebuild the productivity of this orchard. His first season's soil-building practices reveal that he applied 160 hundredweight of AAA superphosphate and used twelve tons of nitrate of potash on orchard sod, mowed and left sixty-five acres of fertilized hay in the orchard, and brought in eight tons of mulching materials which he applied to four acres of young orchard.

Late frosts did much to make the ensuing years unprofitable, but by adding a poultry enterprise and cutting all possible corners, Ernie was able in 1944 to purchase an additional 160 acres, twenty of which were in orchard. The year 1947 found the Markert orchard with its first big crop of fruit. Worries seemed at an end when the crop was finally in the storage and ready for the routine processing to follow. Fate again intervened in the form of a disastrous fire the last week of October, resulting in a total loss of the storage plant and the crop itself.

Many orchard men would have been willing to quit after this last blow, but not Ernie. Patiently with the aid of his brothers and neighbors, he set about rebuilding the cold storage, this time on an even larger scale and with fireproof materials. His new cinder block storage with 35,000 bushels capacity, a model of modern construction, was ready in time for the 1948 bumper crop. This plant has already served as an ideal location for fruit meetings conducted by the County Agent and personnel from the nearby State University.

Soil-building Program - Ernie's soil-building practices for the past three seasons read something like this: 1946--30 tons of AAA spread limestone, 300 cwt. of 7-7-7 and 60 cwt. of 5-8-7 applied to hayland and orchard sod, 10 acres of rye and oats cover crops and 30 tons of mulch. 1947--30 tons of AAA spread limestone, 420 cwt. of 5-8-7 and 100 cwt. of 7-7-7 on hay and orchard sod, 16 acres of wheat cover crops and 32 tons of mulching materials applied. 1948--20 tons of AAA limestone and 10 cwt. of AAA superphosphate, 400 cwt. of 7-7-7 on orchard sod, another 16 acres of wheat cover crops and 50 tons of mulch.

Mr. Markert's farm plans for the 1949 season go well beyond any he has previously attempted. From the AAA office, he has already obtained 40 cwt. of 0-14-14 and twenty tons of limestone. He plans to top-dress his hayland and orchard sod with 400 hundredweight of 7-7-7, plant sixteen acres of wheat cover crop, and bring in fifty tons of mulching materials. He will further qualify for four acres of the land clearing practice. With the aid of technicians from the Soil Conservation Service, he has built terraces and planted about four acres of young orchard on the contour.

Conclusion - The Markert orchard is being slowly culled to produce mainly standard varieties of apples, such as McIntosh, Baldwin, Greening and Wealthy. Ernie has in recent years undertaken the production of his own replacement stock. His accomplishments have come the hard way, but he can point with pride to the excellent physical condition of his land and buildings--tangible evidence that real thought along conservation lines pays for the effort.

* * * * * * * * * * * * * * * * * * * *

Tale of Two Raspberry Plantings. In recent weeks we have seen (1) a planting which yielded heavily and which there is scarcely a brown or yellow leaf and (2) a planting with disappointingly low yield where the leaves on all of the fruiting canes have turned brown and the new canes show many lesions due to spur blight or anthracnose. Planting No. 1 received two thorough applications of Fermate in late spring of 1948 when the new canes were developing.

* * * * * * * * * * * * * * * * * * * *

To Prop or Not to Prop. Propping in some heavily loaded orchards is practically unnecessary. In others it is quite essential. The difference is largely one of tree framework. A leader type tree with no weak crotches will hold a very heavy crop without appreciable breakage. A 400 bu. per acre crop may be borne on well spaced trees of medium size in which only an occasional small limb gives way. Old, tall winter injured trees of poor framework present a different problem. But props in sufficient numbers mean quite an investment. They last only a few years. They provide a hiding place for codling moth during the winter. They interfere with hormone spraying. In our young orchards perhaps we should pay more attention to the development of a framework which will hold up a bumper crop without propping.

* * * * * * * * * * * * * * * * * * * *

Apple Pie Contest. Sponsored by the Massachusetts Fruit Growers' Association and the Massachusetts Department of Agriculture, a Contest open to residents of Massachusetts except professional pie bakers and state, county or federal employees will be held on Wednesday, January 4, 1950, at the Worcester Auditorium. A conventional, two-crust round pie with filling of Massachusetts apples is specified. No criss-cross, frosting or other decorations permitted -- just a plain apple pie. Substantial prizes are offered. Further details may be obtained from your County Extension Office.

* * * * * * * * * * * * * * * * * * * *

A THOUGHT FOR TODAY - "Keep an open mind and someone may drop an idea into it."

* *

Nursery Observations. On a recent 3-weeks nursery inspection trip through Maryland, Delaware, Virginia, Pennsylvania, and New York, the writer had a good opportunity to observe nursery practices and compare the type of tree grown under different conditions. Here are a few observations:

(1) Where a soil improvement program, including barnyard manure, fertilized cover crops and crop rotation is carried out, a large, sturdy tree is developed. In contrast, one nurseryman with a large acreage on poor soil has a scattered stand of impoverished trees, many of which are no larger at two years than they should be at one year of age. If he were to concentrate on half or less of his present area, he should be able to grow more good trees at lower cost, to the benefit of his customers.

(2) The successful nurseryman pays strict attention to each step in the propagation of nursery stock. He selects a good soil, fits it carefully, grows good seedlings, watches every step in budding to avoid mistakes, controls weeds, and keeps a careful watch for insects and diseases. Japanese beetle is not allowed to defoliate his trees. His spray or dust program would do credit to any commercial orchard. In short he plans his operations in such a way that he gets a good stand and grows a high percentage of Number 1 trees. He limits his nursery stock in accordance with his labor and management facilities. His margin of profit is satisfactory and he relies on satisfied customers. In fact his situation is much like that of the fruit grower. Acres or number of trees are of less importance than bushels of good fruit and the margin of return over investment.

* *

SOME EFFECTS OF THE DRY SUMMER

The unprecedented shortage of rainfall during the past few months has been reflected in dry wells and stream beds, curling corn leaves, brown lawns and pastures and a reduced strawberry crop. The high temperatures have favored insect and mite development resulting in very heavy infestations here and there as well as heavier late broods. Hot, dry weather is "made to order" for insects while fungi are favored by long continued wet periods. And any grower who finds more scabby apples at this season than he expected was probably a little too complacent about those seemingly light infections of last May.

With week after week of dry weather during June and July, one wonders how fruit trees have been able to retain their leaves, much less develop a good crop of fruit. The situation might be summarized in this way: A mature apple tree requires several gallons of water each day (as many as 30 in the case of a very large tree). A deep, widely ranging system is essential if an unfailing reservoir is to be available.

Thus a tree with a few of its roots in a permanently moist layer of soil continues to function more or less normally regardless of rainfall. Shallow rooted vegetation may show unmistakable drought symptoms but the deeply rooted tree goes

merrily on its way manufacturing in its leaves the starch essential for fruit development.

And at this point a bit of theory: Light rainfall in May, and consequently an absence of water logged soils in most orchards, permitted fruit trees to develop and maintain roots at a somewhat lower level than in a wet season. These roots have functioned during the dry summer in supplying the urgently needed water. Hence we find in trees on favorable soils, large green leaves, many 3-inch apples, while on coarse excessively drained soils there has been some defoliation, the remaining leaves are off color and many of the apples are undersized. These symptoms may indicate various mineral deficiencies and not merely a shortage of water.

Heavy mulching continues to pay good dividends, particularly on lighter soils. This season a heavy mulch has had an unusual opportunity to exert its influence in preventing evaporation from the soil, stabilizing soil moisture, preventing run-off, etc. The increase in yield as a result of mulching will in some cases amount to 50 bu. per acre or more. Weather conditions this summer have apparently been favorable for fruit bud formation. In some varieties the buds are larger and more nearly round than normally at this time of year. A good bloom in 1950 is therefore in prospect. But the set of fruit is another matter and is dependent on tree vigor, weather at blossoming time, availability of suitable pollen and on the number of pollen carriers.

* * * * * * * * * * * * * * * * * * * *

Orchard Irrigation. Several Massachusetts apple growers have provided additional water during the extended dry spell. Some have hauled water in the spray tank and others have used pipe or hose. A few additional inches of water supplied through irrigation will greatly increase the chances of a profitable crop this season. It is safe to say that the average diameter of apples will, in some orchards, be increased by 1/4 inch. The results of applying 200 or 300 gallons of water per tree in several orchards will be watched with much interest.

* * * * * * * * * * * * * * * * * * * *

LAST CALL FOR RED APPLE CLUB INSPECTIONS. Have you asked your County Agricultural Agent to check your orchard to determine your eligibility for membership in the RED APPLE CLUB? That is your privilege, if you think your orchard may qualify. But the sample to be representative, is best taken while the fruit is still on the trees. The requirements are: (1) 90% clean, (2) 65% U. S. Fancy, (3) 200-400 bu. per acre depending on age of tree, and (4) a sample record of the pest control program.

* * * * * * * * * * * * * * * * * * * *

Fruit Notes

OCTOBER 20, 1949

Prepared by the Departments of Pomology, Entomology, and Botany, and
Other Staff Members
Compiled by W. H. Thies, Extension Horticulturist

Table of Contents

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

APPLE MARKETING (The following analysis of the apple marketing situation is presented by Fred E. Cole, Extension Marketing Specialist. With a large crop of good quality McIntosh to be marketed, a careful study of the factors involved is highly important.)

1. THINK RETAIL (August 8, 1949)

"Think Retail" is the counsel given by manufacturers in appraising market trends and market possibilities. The advice may be wise for us in agriculture, too.

In recent years, retail prices have followed a pattern based upon sales experience and the resulting apparent "attractiveness" to consumers in the minds of store operators and sales managers.

Retail prices were selected, in the accompanying table, on the basis of their frequency of use in retail store advertisements. "A" includes prices used 5% or more of the time, "B" three or four per cent, "C" two to three per cent, "D" one to two per cent of the time in the advertisements studied. The accompanying table may be of assistance in making a comparison of prices. In this table, 20% of the sales was used as a retail mark-up and 20¢ to cover handling from wholesale market to the store. These two marketing costs will, of course, vary in practice. We believe the estimate is of some value as is shown by the following example in October, 1948.

At that time apples were commonly selling for 3 lbs. for 29¢ or 9.66¢ a lb. Store cost on a basis of 20% (sales) would therefore be 7.68¢ (9.6 x .80). Allowing 40 lbs. to the bushel, the bushel cost to the store would then be $3.07. Deducting 20¢ for handling from the wholesale market to retail store, results in a price of $2.87 which was the prevailing wholesale price at the time. It is a simple rule of thumb but it may have its value.

Caution. The consideration given to prices commonly used in retail stores does not mean that these prices should be used by growers in direct sales to consumers. In fact, our counsel would be against it. If growers compete on a quality basis they may keep out of destructive price competition. "Even nickel" pricing on package lots seems to fit the farm-to-consumer sale to better advantage.

"To think retail" in considering the price possibilities for 1949 may be a very practical approach to the problem.

The table on the other side of this sheet may be of assistance in translating retail prices commonly used to wholesale in the six price groups.

	Prices Commonly Found in Retail Stores	Price Per lb.	Wholesale Price Per Box
A	2 lbs. for 25¢, 4 for 49¢, 5 for 59¢	10.66¢--13¢	3.25-3.75
B	3 lbs. for 35¢, 2 for 23¢, 4 for 45¢		
C	3 lbs. for 33¢, 4 for 43¢		
D	3 lbs. for 37¢, 3 for 34¢		
A	5 lbs. for 49¢, 4 for 39¢, 3 for 29¢, 2 for 19¢	9.21¢--10.65¢	2.75-3.25
B	2 lbs. for 21¢		
C	----------		
D	3 lbs. for 31¢, 1 for 10¢		
A	3 lbs. for 25¢, 5 for 39¢	7.64¢--9.2¢	2.25-2.75
B	3 lbs. for 27¢, 5 for 45¢, 4 for 35¢		
C	2 lbs. for 17¢, 4 for 33¢		
D	4 lbs. for 34¢, 4 for 31¢		
A	4 lbs. for 29¢, 4 for 25¢	6.09¢--7.63¢	1.75-2.25
B	3 lbs. for 21¢, 3 for 35¢, 4 for 27¢		
C	2 lbs. for 15¢		
D	5 lbs. for 37¢, 4 for 28¢, 5 for 31¢		
A	5 lbs. for 29¢, 5 for 25¢, 4 for 19¢	4.51¢--6.08¢	1.25-1.75
B	4 lbs. for 23¢, 5 for 27¢, 4 for 21¢		
C	3 lbs. for 15¢		
D	2 lbs. for 10¢		
A	5 lbs. for 19¢	3.00¢--4.5¢	.75-1.25
B	5 lbs. for 21¢		
C	4 lbs. for 17¢, 4 for 15¢, 5 for 17¢		
D	----------		

2. INDIVIDUAL GROWER'S EFFORT IMPORTANT (September 9, 1949)

Grower organizations and trade groups are aware of the large crop of apples expected for 1949. A great deal is being done by sincere and interested people for the good of the industry as a whole. As a result, much has and is being said about what organizations, trade associations and others can do for the fruit grower and the advertising, publicity and promotion which can be done for the grower at the grower's expense. Most of this is as it should be. But it is

only part of the story. What the fruit grower does for himself is the main effort. The effort of grower organizations, trade associations and public agencies is supplemental and aimed at doing those things that growers as individuals cannot do for themselves.

No probable amount of promotion can be expected to overcome consumer resistance to apples that are out of condition, damaged by bruising, priced out of competition, deceptively packed, or not readily accessible to the consumer. Quality, pack and distribution remain in the hands of the individual grower. These ordinary, run-of-the-mill activities are of prime importance in the movement of a crop. They are the unspectacular matters of good marketing practice that require constant attention to detail and personal supervision of the orchardist. A good job of getting the apples to the consumer is as necessary as getting the consumer to the apples. Growers can nullify the efforts of those working in their interest or take advantage of their activities to improve the results of their marketing program. It would seem unnecessary to make these statements, but observation in the years immediately past suggests the necessity and importance of emphasizing the individual grower's part in the marketing program, in the face of a larger than usual crop.

* * * * * * * * * * * * *

The following area distribution of average U. S. apple storage holdings (Dec. 1) may be of help now in interpreting the U. S. Apple Crop estimates and later in comparing U. S. apple storage holdings.

Average 1944-48 Cold Storage Holdings, by Producing Areas, December 1

	Thousands of Bushels	Percent of U.S. Total
NEW ENGLAND - six states	7,728	5.3%
MIDDLE ATLANTIC - N.Y., N.J., Penn.	29,129	20.0%
SOUTH ATLANTIC - Del., Md., Va. W. Va., N.C.	17,013	11.7%
EAST NORTH CENTRAL - Ohio, Ind., Ill., Mich., Wis.	12,615	8.7%
PACIFIC - Wash., Ore., Cal.	72,864	50.1%
OTHER 13 apple producing states	6,163	4.2%
Total	145,512	100.0%

Apple crop estimates for the U. S. will be available this week end. The size of the U. S. crop and its distribution by producing areas are very important in the grower's kit of facts, used by him, to shape his marketing program. The following table gives size of U. S. crops in recent years.

Commercial Apple Crop
United States (35 states) 1924-1948

Thousands of Bushels

1924	88,776	1937	153,169
1925	101,080	1938	105,718
1926	123,550	1939	139,247
1927	79,254	1940	111,436
1928	109,938	1941	122,217
1929	89,270	1942	126,707
1930	105,432	1943	87,310
1931	113,207	1944	121,266
1932	90,023	1945	66,796
1933	81,925	1946	119,410
1934	106,005	1947	113,041
1935	140,398	1948	88,407
1936	98,025	1949(Aug. 1 Est.)	127,823
		Average 1938-47	111,114

Sources

1924-1933 - "Commercial Production" - Agricultural Statistics, 1940, p. 175, table 224

1934-1937 - "Total Production, Commercial" - Agri. Statistics, 1946, p. 168, table 211

1938-1947 - "Total Production, Commercial" - Agri. Statistics, 1948, p. 179, table 219

1948-1949 - "Apples, Commercial Crop" - Crop Production, Aug. 1949, page 49

- - - - - - - - - - - - - - - - - - - -

3. OUR APPLE COMPETITION (September 15, 1949)

1947-8 -- Sixty-nine per cent of the apple receipts for Boston in the marketing year of 1947-48 were from "nearby sources." All New England supplied 72.6% of the receipts. The Middle Atlantic producing area added 4%, South Atlantic 3.1%, and the Pacific states 17.2% of the total receipts. "Other" areas including British Columbia sent 2.9% of the total shipments to Boston.

1948-9 -- Last year, nearby Massachusetts shipments made up 57.1% of the total with all New England 61.5%, Middle Atlantic 4.8%, South Atlantic 5.0%, the Pacific states 25.5%, and "other" 2.8% of the total receipts.

The Pacific state shipments were largely from California in the very early part of the season and from Washington and Oregon in March, April, May and June. Only two carlots were sent in the two years to Boston from the North Central producing area which includes the states of Michigan, Illinois, Indiana, and Ohio.

A Few Observations

A study of these receipts reveals: (see other side)

1. Most of the Boston supply came from nearby areas.
2. The Pacific states were the source of largest competitive volume.
3. The South Atlantic states (Applachia) sent comparatively few apples to Boston.
4. Fewer Northwest apples were sent to Boston in the troublesome late market of 1947 than were sent in 1948 in the same period.
5. A difference of 486 carlots from nearby areas in the supply for the two years is a substantial difference. Also the monthly distributions of nearby apples followed a very different pattern.

Boston Receipts of Nearby Apples by Months 1947-48
1948-9 in Per cent of Total 10 Month Receipts

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May
1947-8	5.3%	12.5%	18.8%	13.1%	10.1%	8.8%	9.2%	11.0%	7.8%	3.3%
1948-9	8.9%	22.4%	21.2%	17.7%	13.0%	3.0%	4.5%	3.1%	1.1%	0

6. These would seem to be little to recommend the 1947-48 pattern.

Apple Receipts - Boston - Ten Months
1947-8 by Producing Areas
CARLOT EQUIVALENT (RAIL & TRUCK)

PRODUCING AREAS	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Total
MASSACHUSETTS	81	190	285	198	153	134	140	167	119	50	1517
ALL NEW ENGLAND	81	192	301	210	163	139	148	180	124	53	1591
MIDDLE ATLANTIC	5	7	1	1	-	-	10	18	10	15	67
SOUTH ATLANTIC	6	4	3	-	-	-	6	4	3	4	30
NORTH CENTRAL	-	-	-	-	-	-	-	1	-	-	1
PACIFIC	31	11	19	18	30	31	35	63	46	48	332
OTHER	2	15	13	9	7	1	3	12	1	2	65
TOTAL	125	229	337	238	200	171	202	278	184	122	2186

1948-49 Carlot Equivalent (Rail & Truck)

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Total
MASSACHUSETTS	92	231	219	183	134	83	46	32	11	-	1031
ALL NEW ENGLAND	92	236	230	197	148	95	60	41	12	-	1111
MIDDLE ATLANTIC	14	19	1	-	-	3	4	5	2	1	49
SOUTH ATLANTIC	22	11	-	3	5	4	4	1	2	-	52
NORTH CENTRAL	-	-	-	-	-	-	-	-	-	-	-
PACIFIC	12	1	12	22	11	12	17	83	107	127	404
OTHER	-	-	2	8	6	4	11	14	8	5	58
TOTAL	140	267	245	230	170	118	96	144	131	133	1674

Source - Daily Fruit & Vegetable Report U.S.D.A. Boston
New England includes Me., N.H., Vt., Mass., Conn., R. I.
Middle Atlantic includes N.Y., N.J., and Penn.
South Atlantic includes Del., Md., Va., W. Va., and N.C.
North Central includes Wis., Mich., Ill., Ind., Ohio
Pacific includes Wash., Oregon, California

- - - - - - - - - - - - - - - - - - - -

4. THE BOSTON SUPPLY OF MCINTOSH (September 22, 1949)

McIntosh apple prices in Boston were on the low 1942 level during the last week. It is noteworthy that Providence and New York had comparable prices. The situation leading to the low price was not confined to the Boston area.

Supply. A comparison of the receipts of apples on the Faneuil Hall Market, Boston, for five weeks before and five weeks after the Labor Day week for the last seven years is given in a table on the other side of this sheet.

The apple receipts for 1948, 1944, 1943, and 1942 approach a normal weekly supply. The abnormality of 1947, 1946 and 1945 is apparent.

The 1949 apple receipts for Labor Day week and the week following were "normal" on the basis of:

(a) the September 1 apple crop estimate for Massachusetts
(b) average proportion of Mass. crop on Faneuil Hall Market - 26% -
(c) average receipts for the two respective weeks -- 3.52% and 4.03%.

Low prices on the Faneuil Hall Market are not the result of excessive supplies.

Demand. Market reports indicate a "fair supply - slow movement." It is evident that there is insufficient demand for McIntosh apples on the Faneuil Hall Market, to clear available supplies at prevailing prices.

There are numerous theories to explain the lack of demand. Predominant among the theories are (1) consumers do not have as much "ready" money as indexes of wages and income imply; (2) consumers are out of the habit of buying apples; (3) some retail prices do not reflect correctly the low wholesale price; (4) many apples are not in good condition and not attractive to consumers; (5) housewives are not cooking any more than they have to. Take your choice. It may be a combination of all of them. The point is what can be done about it.

More Grower Sales Effort. More direct selling to consumers is possible. Good apples then are placed in the consumer's hands at a good return to the grower (5 to 8¢ a lb.). Fresh, juicy apples constitute the best possible advertising available to the industry. Newspaper ads, radio and attractive roadside displays can play an important part in increasing the consumption of apples. Advertising and increased sales effort, along this line, increases apple sales in retail stores and the movement in all trade channels.

Improve the quality of apples in retail stores by sorting out poorer fruit, more careful handling all along the line, store delivery and store service when feasible, visiting retail stores to look over displays from a buyer's point of view and taking steps to improve apple appeal.

Price apples in direct sales at a reasonable margin over wholesale.

EVERY EFFORT MADE TO INCREASE APPLE SALES HELPS EVERYONE SELLING APPLES

With normal supply and a low price, MORE SALES EFFORT is clearly in order to get this apple deal off dead-center and headed in the right direction.

Apple Receipts - Bushels
Faneuil Hall Market - Boston
Eleven Weeks between Aug. 1 - Oct. 20, 1949-1942

	Weeks	1949	1948	1947	1946	1945	1944	1943	1942
Weeks	5	6,802	7,309		4,622	4,859	14,750	11,538	
previous to	4	13,918	5,886	6,210	4,944	8,707	16,948	10,038	24894
Labor Day wk.	3	17,649	11,608	9,320	5,617	8,405	22,703	21,971	27280
(August)	2	19,831	19,010	10,945	13,289	11,413	20,191	21,119	31906
(September)	1	19,023	14,868	16,702	7,909	9,174	32,117	15,050	44732
Labor Day wk.		26,172	21,306	15,584	12,559	10,987	24,932	21,449	32475
Wks. follow-1		38,792	21,938	24,242	16,739	13,150	26,467	22,095	42541
ing Labor	2		39,716	26,193	16,253	15,515	23,742	33,352	45760
Day Week	3		34,566	27,137	16,751	9,674	16,935	29,716	29031
(September)	4		27,253	24,821	23,614	10,924	19,651	23,459	32961
(October)	5		27,951	39,896	21,490	7,480	14,510	22,661	22977

- - - - - - - - - - - - - - - - - -

5. A MAJOR PROBLEM OF DISTRIBUTION (September 29, 1949)

I visited the excellent display of the apple industry in the Massachusetts Building at the Eastern States Exposition last week. Thousands of people visited this exhibition, sometimes 3,000 people an hour. An orchard, a packing house, a cider press, a roadside stand and a kitchen featured the production, handling, processing and utilization of commercial apples. Those who saw the exhibit were increasingly aware of apples. The large quantity of apples and cider sold, testifies to the latent desire of many people for apples.

The most frequent question heard among the visitors was a despairing inquiry "WHERE CAN I GET APPLES LIKE THESE?"

Having in mind the good crop of fine quality apples being harvested with the picking exceeding earlier estimates, the apparently overstocked markets, and the current low price, such a query seemed the last straw. And yet, there it is. Apples, apples everywhere and not a one to eat!

Most growers with large orchards have been in the habit of placing all of their apples in wholesale channels - the same channels used by growers in surplus producing states. They have used their time and energy in taking care of the harvesting and preparation for shipment. Shipments have been made to large wholesale markets to the west and south in direct competition with fruit from other areas in order to better local returns. McIntosh can meet much of the competition but costs of transportation are high - even higher now than several years ago. The low price is general.

Massachusetts producers are located in a consuming area - a state with 22,163 food stores doing 492 million dollars annual business even in pre-war (1939). Sales in 1948 were estimated at three times this pre-war figure with 90% of the stores.

The 64 dollar question is on the table face up! How can local growers take advantage of the fact that they are producing apples WITHIN a consuming area.

To what extent and how can the usual channels of distribution be used to advantage? How can growers work with men in these channels in order to get a satisfactory distribution? How must these channels be supplemented so that thousands of people who would buy apples will buy them?

How can a situation where people and apples are in the same area be used to increase the return to apple growers?

This MAJOR PROBLEM of DISTRIBUTION must be faced by the local apple industry with all the resources at its command. Lots of people, good apples and a return lower than cost, just does not make sense!

The echo of that question "Where can I get apples like these" keeps returning. The major problem of getting the apples to these people lies on top of a high stack of apples. It must be solved to get a satisfactory return.

****

As if to punctuate the statement that the low price of apples on Faneuil Hall Market was not caused by excessive supplies, the supply of apples on the Faneuil Hall Market last week dropped to 3/4 of the week before at no increase in price.

****

The supply of "deciduous fruit" on the Boston Market for the week ending September 17: (carlot equivalent basis) 76 carlot of apples, 98 carlot of melons, 31 1/2 carlot of pears, 30 carlot of peaches, 10 carlot of fresh prunes, 8 carlot of bananas, 4 1/2 carlot of plums, 3 1/2 carlot of blueberries, 3 carlot of mixed berries (strawberries mostly), 1 carlot of figs. And arrival carlots on track at the start of the week amounted to 389 carlots. Only 76 carlots of apples!

****

For the last month arrivals of shipped-in deciduous fruits at Boston have decreased substantially. The prices of seasonal items have been in a downward trend! Apples are not alone in the present price situation.

****

The time for INCREASED SALES EFFORT for apples is now!

- - - - - - - - - - - - - - - - - -

6. ORDERLY MARKETING - RATE OF MOVEMENT - WHAT DO THEY MEAN? (August 22, 1949)

The object of orderly marketing is the greatest possible return, not only for the present but also for a period of years. It might also be added not only for a week but for the season. It is the return for the season that must pay the bills of growing the crop, maintaining the farm and a year's living.

Orderly marketing covers handling, method of sale, distribution and promotion, and suggests care in laying out a program as well as courage in carrying it out.

Rate of movement of a crop has a particular reference to the physical disappearance of that crop. Any rate may be judged against a previous rate, an average rate, or a desired rate. It has to do with balancing the supply over the season -- adjusting the physical movement of the crop to the number and kind of sales outlets, and periods of maximum and restricted consumer acceptance. The rate of movement is testimony to the correctness of price and the adequacy of the sales effort.

The rate of movement of the crop during the last year or two and over the last five years might well be used as a guide.

At the bottom of this sheet are four such guides.

1. Average out of storage movement for McIntosh for the last five years.
2. Out of storage movement for 1947.
3. Out of storage movement for 1948.
4. The McIntosh storage line which might represent a desired out of storage movement as a base. It is something like a home town which is described as a place you are away from. The McIntosh storage line offers such a base to be "at" or away from as good judgment dictates.

The McIntosh storage line has several points.

1. It starts on October 15 -- the storage reporting date of maximum storage.
2. It progresses at two week intervals corresponding to the storage report.
3. It terminates on March 1 when most agree that McIntosh should be sold, with a 5% provision for the choice lots to be sold in March.

The McIntosh storage line is an attempt to provide a base to judge rate of movement and in turn correctness of price and the adequacy of the sales effort. Percentages are all computed on the October 15 amount as a base.

Out of Storage Movement - McIntosh - "Boston Area"
1947-1948 - Average of the Last 5 Years
And a Suggested McIntosh Storage Line
Expressed as Percentage of the Oct. 15 Stored Supply
Remaining in Storage at Specified Dates

	1947	1948	Average last 5 years	The suggested McIntosh Storage Line
Oct. 15	100%	100%	100%	100%
Nov. 1	95.8%	94.5%	91.8%	92%
15	63.9%	81.5%	75.5%	80%
Dec. 1	71.6%	66.7%	66.2%	65%
15	61.1%	49.0%	53.8%	50%
Jan. 1	54.0%	32.8%	42.3%	40%
15	47.1%	24.5%	35.8%	30%
Feb. 1	36.2%	17.6%	27.6%	20%
15	30.6%	10.2%	21.1%	10%
Mar. 1	24.4%	6.7%	16.5%	5%
15	17.5%	3.4%	11.9%	2 1/2%
Apr. 1	9.9%	---	7.0%	---
15	---	---	---	---

The marketing season of 1949 has many of the earmarks of 1947 and 1944. The memories of 1947 are still vivid. The rate of out-of-storage movement for this year may be of particular significance in planning marketing operation.

-- Fred E. Cole

- - - - - - - - - - - - - - - - - -

1949 Apple Purchase Program Announced for Massachusetts. Authorization has been received by the State PMA Office to purchase apples for the school lunch program and for export. The 1949 apple crop in the New England area is about 60% above that of last year and 40% above the ten-year average. The offer to purchase has been made in response to a request of apple growers from the New England area and the whole country. The total amount of apples to be purchased in Massachusetts is 28 cars during the month of October, but the rate of purchase will be limited by the capacity of the school lunch program to take the fruit. Authorization is expected to purchase additional supplies in later months at approximately 9 cars per week. The price will be $1.70 per bushel for U.S. No. 1's of the following varieties: Baldwin, Cortland, Delicious, Golden Delicious, McIntosh, Northern Spy, Rome Beauty and R. I. Greening. Apples may be packed in either bushel baskets or Eastern apple crates protected in the usual way by liners and covers. Shipment will be made in car lots of 560 bushels per car or the equivalent in truck lots.

An office of purchase has been established in the Middlesex County PMA Office on Stow Street, Concord, in the Old High School Building. The Purchase Representative is W. T. Pearse of Bolton. His telephone number at the office is Concord 1299. The State PMA Committee will be assisted in the administration of the program by an advisory committee of representatives of the Extension Service and the State Department of Agriculture together with the following apple growers: Roger E. Peck, George S. Gay, Ben Drew, Archer L. Pierce, Harold Priest, Stephen W. Sabine, George S. Davis, H. Sidney Vaughan, and Leander B. Nichols. This Advisory Committee is established to assist the PMA in carrying out the terms and conditions of the Apple Purchase Program. This program has two features. The first one is designed to increase the export of apples to foreign countries and carries a proposal of an export subsidy not to exceed $1.25 a bushel, in addition to the amount paid by foreign countries. The second feature of the program contemplates the purchase of apples for use in the school lunch program and distribution to eligible welfare institutions. The program is what is known as a surplus removal program and is not to be confused with the programs which are designed to support and maintain a certain market price for farm commodities.

* * * * * * * * * * * * * * * * * *

New Leaflet, "Apples At Any Meal". An attractive and highly useful leaflet on the use of apples has been prepared by May E. Foley, Extension Nutritionist. It includes recipes for fruit cup, salads, relishes, main dishes and desserts, using the common ingredients which all homemakers have. It gives suggestions for canning juice and apple sauce, and for using these products in the winter. A copy may be obtained from your county extension agent or from the Mailing Room at the University. Just ask for Special Circular No. 156.

* * * * * * * * * * * * * * * * * *

No September Fruit Notes. No issue of FRUIT NOTES was distributed during the month of September.

* * * * * * * * * * * * * * * * * *

EXPLANATORY NOTES ON "MCINTOSH STORAGE LINE"

An appraisal of a market price can be made by comparing actual crop movement to a desired crop movement. A suitable standard of crop movement is therefore desirable as a tool for measuring current crop movement.

The chart on the other side illustrates a "MCINTOSH STORAGE LINE" which may be used as a base to measure current out-of-storage movement of McIntosh apples.

The chart also carries four dotted lines indicating the out-of-storage movement of McIntosh from the BOSTON AREA cold storages in the years of 1948, 1947, 1946 and 1944. The record of the short crop of 1945 is valueless for this purpose and is therefore not included.

The tables below give the figures used in making the chart.

You may plot the out-of-storage movement of McIntosh for 1949-50 on this chart from figures released by the MDA Special Apple Market Report. All percentages are based on the October 15th storage holdings.

You may also plot your own out-of-storage movement of McIntosh by basing your percentages on McIntosh in storage on October 15, 1949.

The "MCINTOSH STORAGE LINE" is not presented as an ideal out-of-storage movement although there is considerable support for such a statement. Also this indicated out-of-storage movement stands up profitably when applied to the last 14 years where comparable storage figures are available.

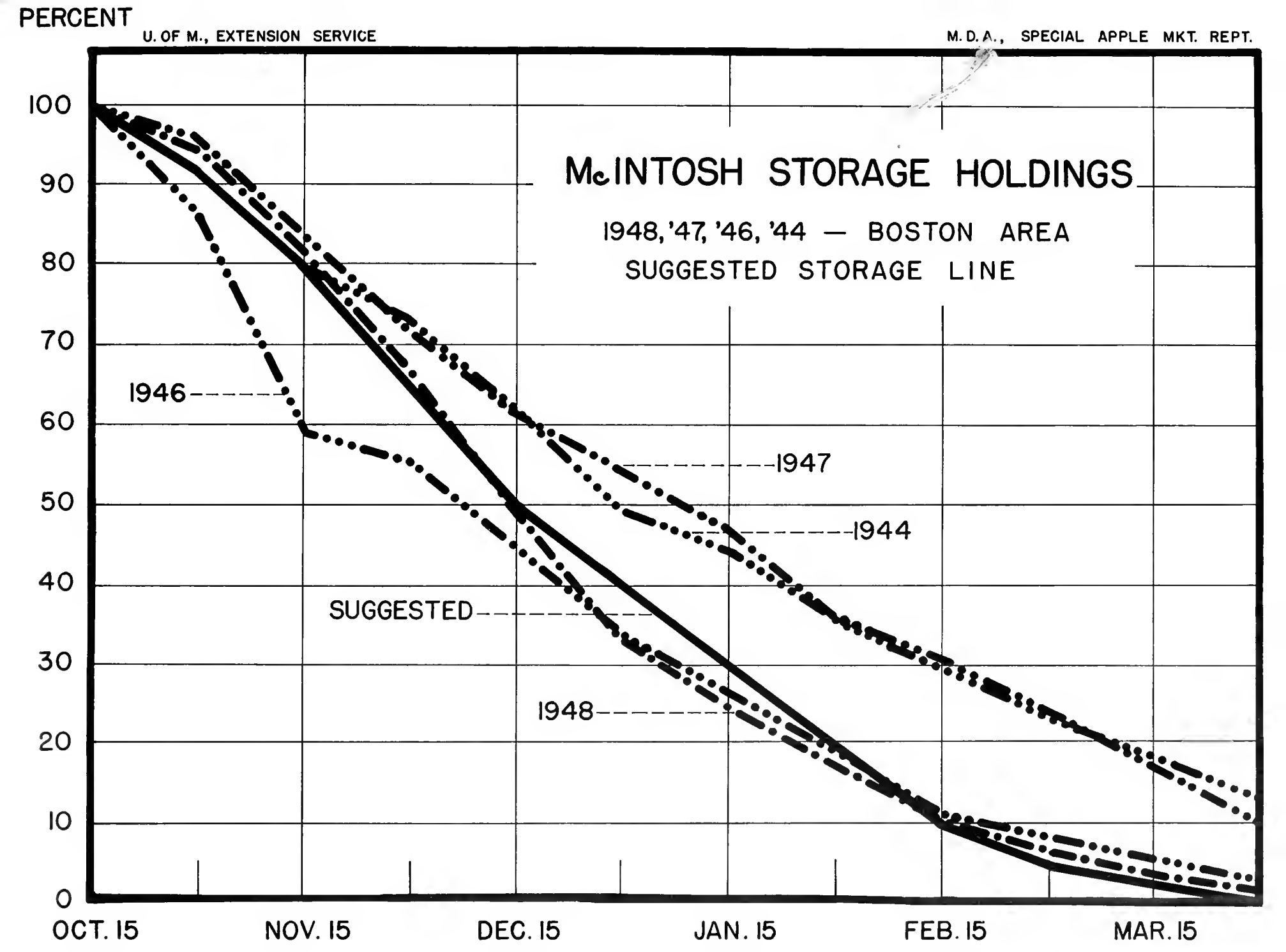
The "MCINTOSH STORAGE LINE" furnishes a means of measuring the out-of-storage movement of McIntosh. It starts and is based upon the maximum amount in storage. It stops when most agree that the McIntosh should be all sold. It furnishes a guide to an orderly movement of the crop with the most rapid movements in periods when the most sales outlets are available and when people seem to want apples the most.

McIntosh Storage Holdings
Boston Area

Date	1948%	1947%	1946%	1944%	Suggested %
Oct. 15	100.0	100.0	100.0	100.0	100.0
Nov. 1	94.5	95.8	86.5	92.0	92.0
Nov. 15	81.5	83.9	59.0	79.9	80.0
Dec. 1	66.7	71.6	55.3	72.7	65.0
Dec. 15	49.0	61.1	44.4	61.3	50.0
Jan. 1	32.8	54.1	33.1	49.3	40.0
Jan. 15	24.5	47.1	26.2	44.3	30.0
Feb. 1	17.6	36.2	19.0	35.8	20.0
Feb. 15	10.2	30.6	11.1	29.6	10.0
Mar. 1	6.7	24.4	8.3	23.8	5.0
Mar. 15	3.4	17.5	5.2	18.6	2.5
April 1	1.7	9.9	3.1	12.7	0

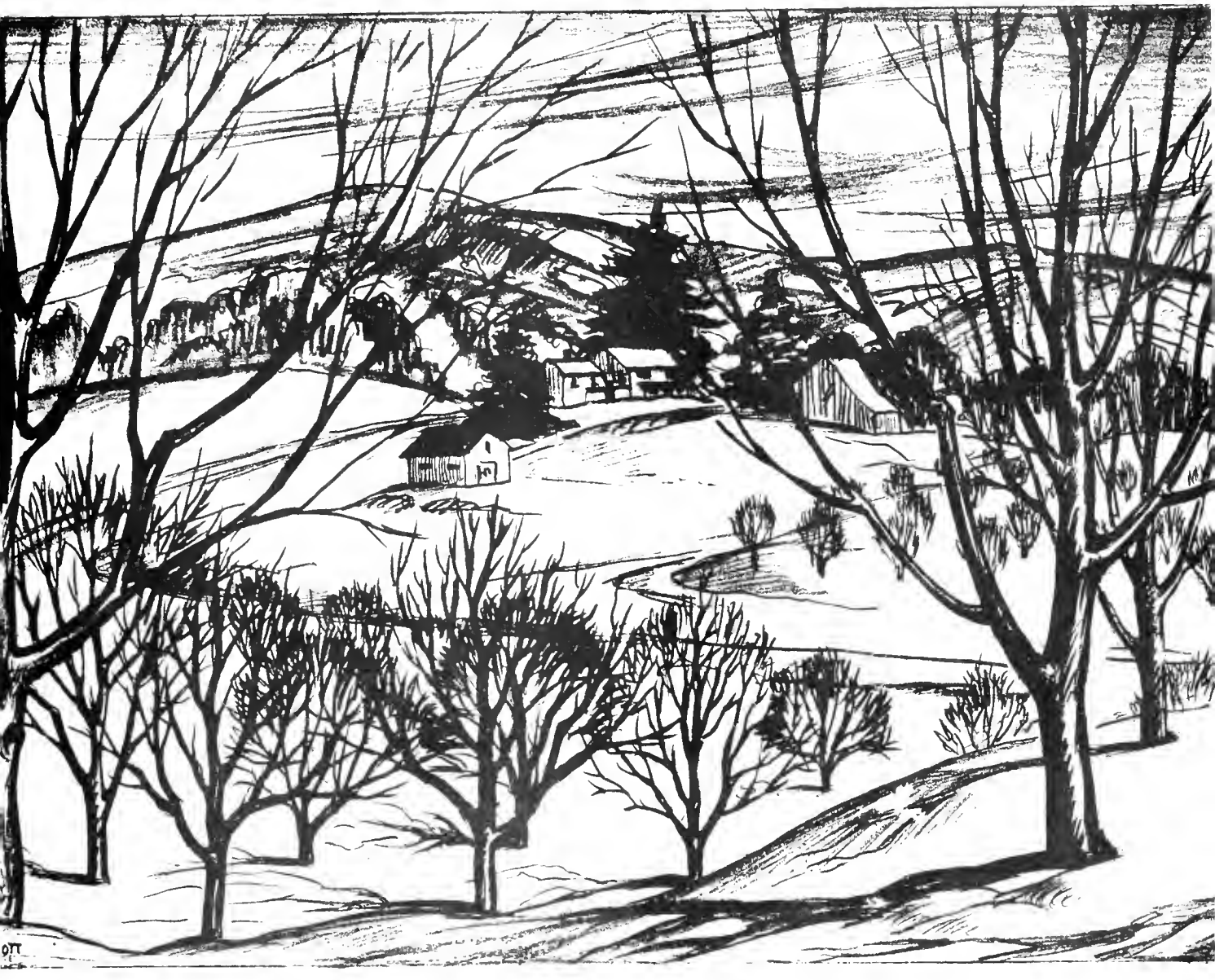
* * * * * * * * * * * * * * *

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


PERCENT
U. OF M., EXTENSION SERVICE
M. D. A., SPECIAL APPLE MKT. REPT.
McINTOSH STORAGE HOLDINGS
1948, '47, '46, '44 — BOSTON AREA
SUGGESTED STORAGE LINE
100
90
80
70
60
50
40
30
20
10
0
1946
1947
1944
SUGGESTED
1948
OCT. 15
NOV. 15
DEC. 15
JAN. 15
FEB. 15
MAR. 15

Fruit Notes

NOVEMBER 30, 1949



Prepared by the Departments of Pomology, Entomology, and Botany, and
Other Staff Members
Compiled by W. H. Thies, Extension Horticulturist

CONTENTS

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

BLUEBERRY SITES AND SOILS

The selection of a good site and a good soil for cultivated blueberries is an exceedingly important step in establishing a successful planting. Both must receive proper considerations. To overemphasize one at the expense of the other can be a costly mistake. For example, one grower looked over considerable territory to find an ideal blueberry soil. He finally located a peat bog and set his plants. The site was entirely surrounded by hills and proved to be a bad frost pocket. Now he has a serious problem protecting his bushes from frost during the blooming season. It would be equally bad to choose a site on a hillside for good air drainage and then find later that the soil is too dry. The ideal site is located so that excessive amounts of cold air do not drain down through it from bare areas above, and has sufficient air drainage so that cold air does not accumulate around the bushes. That is, the ideal site has natural protection against both winter injury and spring frosts. It must also include a good soil.

The ideal blueberry soil has an adequate and continuous supply of moisture, plenty of organic matter, and is acid. The importance of good moisture conditions cannot be overemphasized. The highbush blueberry requires a good supply of moisture throughout the growing season. Even short periods of soil moisture shortage can affect the plants adversely. On the other hand, excessive soil water is undesirable. The bushes will tolerate flooding during the dormant season but during the growing season the roots must be out of water so that they can get air. Another disadvantage of a waterlogged soil is that the freezing and thawing of the soil in fall and spring may heave the plants out of the ground, thus breaking off many of their roots.

It has been stated that the water table (that depth in the soil where free water will be found) should be 18 to 24 inches from the surface. While such a high water table is necessary to provide adequate moisture in the root zone in some of the light sandy soils on which blueberries are often planted, it is not necessarily so for heavier soils where water in sufficient quantity will rise from lower levels. The important thing is that the soil be kept moist. The height of water table required to do this will depend on soil type and amount and distribution of rainfall.

Where the soil tends to be a bit dry during the summer, mulches can be used to conserve moisture and will go a long way toward overcoming this difficulty. A number of mulches may be used such as sawdust, shavings, pine needles, waste hay, dried leaves, and peat. A dry situation can be improved, particularly for small plants, by digging a large planting hole and putting in the bottom a generous quantity, up to a half bushel or more, of peat, rotten sawdust, rotten, crumbly wood or some similar material. Dry peat will need to be well wetted before use, otherwise it may take water away from the roots of the plants and cause them to suffer from lack of moisture.

While it is true that blueberries will grow in pure sand if plenty of moisture and mineral nutrients are supplied, experience has shown that under natural conditions they grow much better in a soil well supplied with organic matter, particularly if this is of a peaty nature. The minimum needs will depend on the type of soil and have not been adequately determined. Certainly very sandy soils require more than heavier soils. There appears to be no upper limit, at least as far as acid peats are concerned, since the bushes will thrive on pure peat.

The cultivated blueberry has a reputation for being rather fussy about the acidity of the soil in which it grows. Although it does require an acid soil, it will grow over a rather wide range of soil reactions within the acid range. It has been reported as growing at a pH as low as 3.4, which is extremely acid, to as high as 6.5, which is nearly neutral. Under natural conditions best growth usually results in a pH range of 4.5 to 5.0. At a soil reaction much above 5.6 a green and yellow mottling of the leaves, or chlorosis, is apt to develop unless special precautions are taken to prevent it. At a soil reaction below pH 4 a light application of lime, which should probably be a high magnesium lime, may be beneficial.

To insure success with cultivated blueberries, select a site with good air and soil drainage and a soil with plenty of moisture, plenty of organic matter, and an acid reaction.

-- J. S. Bailey

* * * * * * * * * * * * * * * * * * * *

INSPECTION OF NURSERY STOCK FOR TRUENESS-TO-NAME

The nursery inspection program for 1949 took our inspectors into eleven states from Massachusetts south to Virginia and west as far as Iowa and Kansas. No requests were received from Tennessee or Alabama nurserymen this year. A total of 27 concerns were served.

The inspection crew now totals eight, two of whom were new this season. Not all eight men are available for the entire season so we are attempting to train sufficient men to handle the job without its being a burden on anyone.

Again this year the inspection program covered apples, pears, plums, and cherries but not peaches. The volume of stock inspected is impossible to determine accurately, but our estimate is around three million trees. Mixtures of serious proportions still persist, especially in blocks of grafted trees or where the nursery has purchased propagation wood from uninspected sources.

A complete list of nurseries served by the Massachusetts Trueness-to-Name Inspection Service may be obtained from the Pomology Department at the University.

-- A. P. French

* * * * * * * * * * * * * * * * * * * *

SOME FACTORS TO CONSIDER IN COLD STORAGE MANAGEMENT

This year with a large crop of apples in storage, good storage management is going to be necessary to maintain the fruit in the best possible condition. We may expect an extended storage season and McIntosh, especially, requires attention to details if it is to be held in good condition beyond January.

Some factors which influence the storage life of apples are: (1) firmness of fruit at harvest, (2) amount of bruising on the fruit when placed in storage, (3) storage temperature, (4) humidity of the storage atmosphere, and (5) presence of ripening gases in the atmosphere.

1. Firmness of fruit at harvest. Obviously, apples which are rather mature and relatively soft at harvest time are not going to keep as long as those which are firmer. Such fruit should be disposed of first and, if possible, stored separately since they produce large quantities of ripening and scald gases which will tend to shorten the storage life of less mature lots. There is still considerable controversy as to whether pre-harvest hormone sprays hasten ripening. Data on McIntosh indicate that in some seasons the application of hormone may hasten ripening and its effect has been detected in respiration and firmness studies within a few days following its application. Failure of hormone sprayed trees to keep as well as non-sprayed fruit may be related also to the fact that hormoned fruit has been allowed to hang until overripe.

2. Degree of bruising. It should be kept in mind that prevention of bruising at harvest time is important not only for appearance's sake but also from the standpoint of firmness. Apples soften faster when bruised than similar apples bruise-free.

3. Storage temperature. In the fall, rapid cooling cannot be overemphasized. Apples held at 40° F. ripen about twice as fast as they do at 32° F., and at 60° F. about three times as fast as at 40° F. Be sure when building a storage that ample cooling capacity is provided and remember that a forced-air circulation system will cool the fruit faster than a coil system of similar cooling capacity which develops relatively weak air currents.

4. Humidity. At temperatures of 32°F. attempt to maintain a relative humidity around 90%. Under these conditions shriveling will be held to a minimum. Biggest losses of moisture from apples is to wooden boxes and cold coils. Moisten the boxes if they have not been heavily rained upon. If possible, when the room is loaded and down to proper storage temperature, raise the refrigerant temperature so that the differential between it and storage room air is small. Coils at 10° F. will take much more out of the air moisture than coils at 25° F.

5. Ripening gases. As apples ripen they produce several ripening gases. Ethylene is apparently most active in this regard although recent investigations at Cornell University indicate that other gases may have a similar influence. Batches of ripe apples produce sufficient quantities of these ripening gases to hasten the rate of softening of less mature lots. The problem of removing these gases cannot be accomplished by simple ventilation procedures. Cold storage ventilation is usually not feasible except when outdoor temperatures are near 32° F. and such periods in the first month or six weeks of storage are short. Also, as soon as ventilation ceases the ripening gases will build up rapidly to their former level. After an apple has been in storage a month to six weeks it has probably reached the point where ripening gases no longer influence its rate of softening. Although the air-purification method utilizing activated, coconut shell carbon is not entirely satisfactory for complete removal of all ripening gases, it is probably superior to any other known method. Also, air-purification will aid in scald control and in eliminating many types of storage odors.

-- F. W. Southwick

* * * * * * * * * * * * * * * * * * * *

From the November 22 Special Apple Market Report, - "Only highest colored, firm fruit bringing top quotes."

* * * * * * * * * * * * * * * * * * * *

MCINTOSH STRAINS

Rogers McIntosh continues to be the outstanding strain in respect to amount and type of red color of all the strains which are being studied at Amherst.

The analysis of this year's crop from the McIntosh strain orchard revealed that the percent of apples with 90% or more red color ranged from a low of 28 to a high of 90. As was the case last year, Rogers had the highest rating while strain 39 (a striped type) had the poorest. This year there was more difference between Rogers and the next best strain, Strain 1 having only 76% of its crop with 90% red color. Percent of color for the other strains was Greening, 75%; Strain 8, 69%; Strain 45, 62%; and Strain 12, 59%.

All of the blush strains except Rogers produced some striped apples. Strains 1, 8, 45 and 12 had more striping than Greening. Whether or not this striped condition is due to an unstable condition of the strains or to the possibility that the strains are not true "bud sports" remains to be determined. There is evidence that some strains are not stable and that careful selection must be practiced to maintain their desirable characters. It is encouraging that so far Rogers appears to be a stable strain and continues to produce high colored fruit of the blush type.

-- W. D. Weeks

* *

MULCHING THE STRAWBERRY BED

Occasionally reports are received indicating that some grower who did not mulch his strawberry bed experienced less injury than anticipated. To omit the mulch another season would be hazardous and a gamble. Our winter climate calls for the protection of our strawberry beds.

Mulching has been practiced to an increasing extent ever since 1865 when John Knox of Pittsburgh, Pennsylvania, demonstrated the value of applying a mulch to this crop. Thus the use of straw has a direct connection with the name of this berry. Southwest Texas is one of a very few regions where mulching with straw or other material is not practiced commercially.

As soon as cool November weather has checked growth and hardened off strawberry plants, a mulch about three inches thick should be applied for winter protection. It prevents heaving of plants caused by freezing and thawing, prevents crown injury, delays spring growth until more favorable weather, and avoids winter drying of plants. During the fruiting season, the mulch conserves soil moisture, discourages weeds, keeps fruit clean, and pickers prefer it to bare soil.

Experience suggests a mulch which does not mat down so closely that plants are smothered, remains where placed; is free from troublesome weed seeds, is easily applied, and is also cheap.

Where obtainable, marsh hay or swale grass is as good as straw, and cheaper. Seaweed has proved practical for local use. On Cape Cod pine needles have been used, but the supply is limited and the mulch rather too compact. Baled straw

may cost more but is a good mulch and frequently used, provided any smothering chaff is discarded. Growing rye, oats or millet especially for mulching is practical, if these crops are cut before their seeds mature.

-- O. G. Anderson

* *

GROWTH RELATIONSHIPS IN PEACH TREES

(Review of a paper on "The Relationship of Leaf Color, Nitrogen and Rainfall to the Growth of Young Peach Trees," by W. P. Judkins, Ohio Agr. Exp. Station)

Many peach orchards are located on sites and soils that are subject to erosion under the usual practice of cultivation. There is now a trend toward the use of sod systems of soil management to reduce erosion and soil depletion.

Soil moisture and nitrogen are the factors which are most frequently limiting in orchards where peach trees are grown in sod. Most investigators have reported reduced growth of young peach trees when grown in sod as compared to trees grown under cultivation. Some investigators report satisfactory growth and yield of bearing age peach trees when grown in sod.

The experiment conducted by Dr. Judkins was designed to secure additional information on the growth response of the young trees under a sod system and to study the influence of various amounts of nitrogen on such trees.

Halehaven trees were planted in the spring of 1944 and 1945 on a deep, well drained silt loam. Some of the trees were planted in an overwintered crop of rye and the land was then disked and seeded to a mixture of blue grass, timothy, red top, alsike clover and red clover. The land was not plowed or cultivated at any time. Several different nitrogen fertilizer treatments were established when the trees were set.

The trees under cultivation were set at the same time as those set in sod. They have been maintained under a system of trashy cultivation from the middle of May until late June when a summer cover crop of soybeans was planted. In September the land was disked and seeded to rye. Nitrogen was applied at the rate of 1/4 pound of a 20% nitrogen fertilizer for each year of tree age.

Rainfall in the summer of 1944 was below average. This lack of rainfall had a retarding effect on the trees grown in sod plots. This suppression of growth was sufficiently severe to exert a retarding influence on tree growth for several succeeding seasons.

* *

COUNTY AGENTS' CORNER

The Values of Mulch - (Some interesting observations are here presented by Bertram Tomlinson, County Agent-Manager, Cape Cod Extension Service)

The value of mulch in regard to the culture of blueberries has been emphasized and re-emphasized so that it has become a pretty well known factor. We have been told that mulching with straw, leaves, cheap hay or any organic material saves labor by keeping down the weeds and conserves moisture. I have always felt that there was another very important function for mulch material that has never been sufficiently emphasized, and that is, that mulch acts as

The trees set in 1945 received an adequate amount of rainfall during the growing season and the trees set in the sod plots made more satisfactory growth than those in the cultivated plots. The rate of tree growth for the trees in the two systems was similar for succeeding seasons. There has been no apparent difference in the rate of tree growth, as indicated by trunk circumference, between the various fertilizer treatments up to the present time. This would indicate that nitrogen was not a limiting factor in this soil type.

This investigator found a correlation between the leaf color and leaf nitrogen. Leaf color was determined by a photo-electric reflection meter.

Results from this experiment would indicate that on this soil type, soil moisture was a more important factor than nitrogen. The results also indicate that in seasons with adequate rainfall, peach trees made as good growth under sod as under a cultivation-cover crop system of management during their first three years in the orchard.

-- J. F. Anderson

* *

an insulator and keeps the soil at a more uniform temperature throughout the day and night.

A few years ago I had occasion to propagate a privet hedge by making cuttings and these were placed in a very light, sandy soil. While the bed was kept well watered, it seemed apparent to me that the cuttings were not growing as they should, so about the middle of June I tried a very interesting experiment. The cutting bed was thoroughly wet down and a light application of fertilizer (5-10-10) was applied as a top dressing. One half of the bed was then mulched with about two inches of sawdust and the other half was left for clean cultivation. Both parts of the bed received the same treatment in regard to irrigation, but I was amazed to notice that within two weeks the part of the bed mulched with sawdust took on a darker green color and started a luxuriant growth. In fact, the bed mulched with sawdust grew so much faster than the unmulched that I became more interested in speeding up the growth of the small plants, so terminated the experiment at the end of six weeks, and applied a sawdust mulch to that portion of the bed that had none. It was of interest to note that here again the response was remarkable and while the color and growth became uniform that portion of the bed which was unmulched during the six weeks period never did attain the height of the other section.

It seems to me that this experiment has a lesson of great value to all horticulturists, and as I pondered the reasons for the difference in growth, I was satisfied that it must have been due entirely to the insulating effect of the sawdust and that the temperature under the sawdust must have been many degrees cooler than the unmulched area. Unfortunately, this bright idea did not occur to me in time so that I could actually measure the temperature differences with a thermometer, so I was particularly interested this year in observing a similar case in relation to blueberries.

Bill Richards had set out about ten acres of blueberries this past spring, and at the time of planting mulched them with three or four inches of sawdust and shavings. One section of the field had only one application of water during the extreme prolonged drought experienced when we had practically no rain from the 25th of May to the first of September. Despite this abnormal situation, the plants made a fair to moderate growth. On the area that was irrigated twice, the growth was excellent. Another planting on a nearby farm without mulch resulted in stunted growth and the loss of 20 to 25% of the plants.

Since making these and other similar observations, I was greatly interested in reading an article entitled, "The Effect of Soil Management on Yield of Cultivated Blueberries" by Vladimir Shutak, E. P. Christopher and Leona McElroy of Rhode Island State College. These people reported on the use of various mulch materials and their observations included the differences in yield secured with different kinds of mulch, differences in soil moisture and also differences in soil temperature. A lack of space will not permit me to comment on this paper in detail. Suffice it to say that the experiment did prove without question, that one of the great values of mulch material was the fact that it helped to maintain a more uniform soil temperature in addition to the conservation of soil moisture.

It seems to me that this maintaining of a uniform soil temperature is another big reason why farmers and gardeners should give more attention to mulch in the growing of fruits and vegetables.

* * * * * * * * * * * * * * * * * * * *

SOME OBSERVATIONS IN MARKETING PROCEDURES

As a feature of the course in fruit marketing by the Pomology Department, it is customary to take the students on a two-day trip to Boston. The first day is spent visiting storages and packing houses in order that these young men may observe how apples are stored and prepared for market. A stop is also made at the New England Vinegar Works so that they can see how culls are disposed of. The second day is spent in Boston visiting the several markets so that the class may obtain first hand information on methods of sale.

A few general impressions gained from the trip this year are as follows:

1. The large volume of high grade McIntosh apples that are now in storage. One grower whom we had hoped to visit advised that we had better not come this year because his storage house is so full that we couldn't get into it.

2. The care which was evident in the packing houses visited to prevent bruising by careful handling of the fruit.

3. The relatively high grade culls which were going into cider and vinegar. The elimination of rotten apples in the fruit used is a credit to any cider manufacturer. Certainly, the more discriminating purchasers of cider will highly commend this practice.

4. The extent to which labor-saving equipment is being employed to increase efficiency in the handling of apples in the storages and packing houses.

5. The flagrant disregard for the Massachusetts Apple Grading Law, particularly with respect to the absence of required markings on closed packages.

6. The traffic congestion and confusion around Faneuil Hall Market which for many years has added enormously to the cost of doing business. Relief from this condition cannot come too soon.

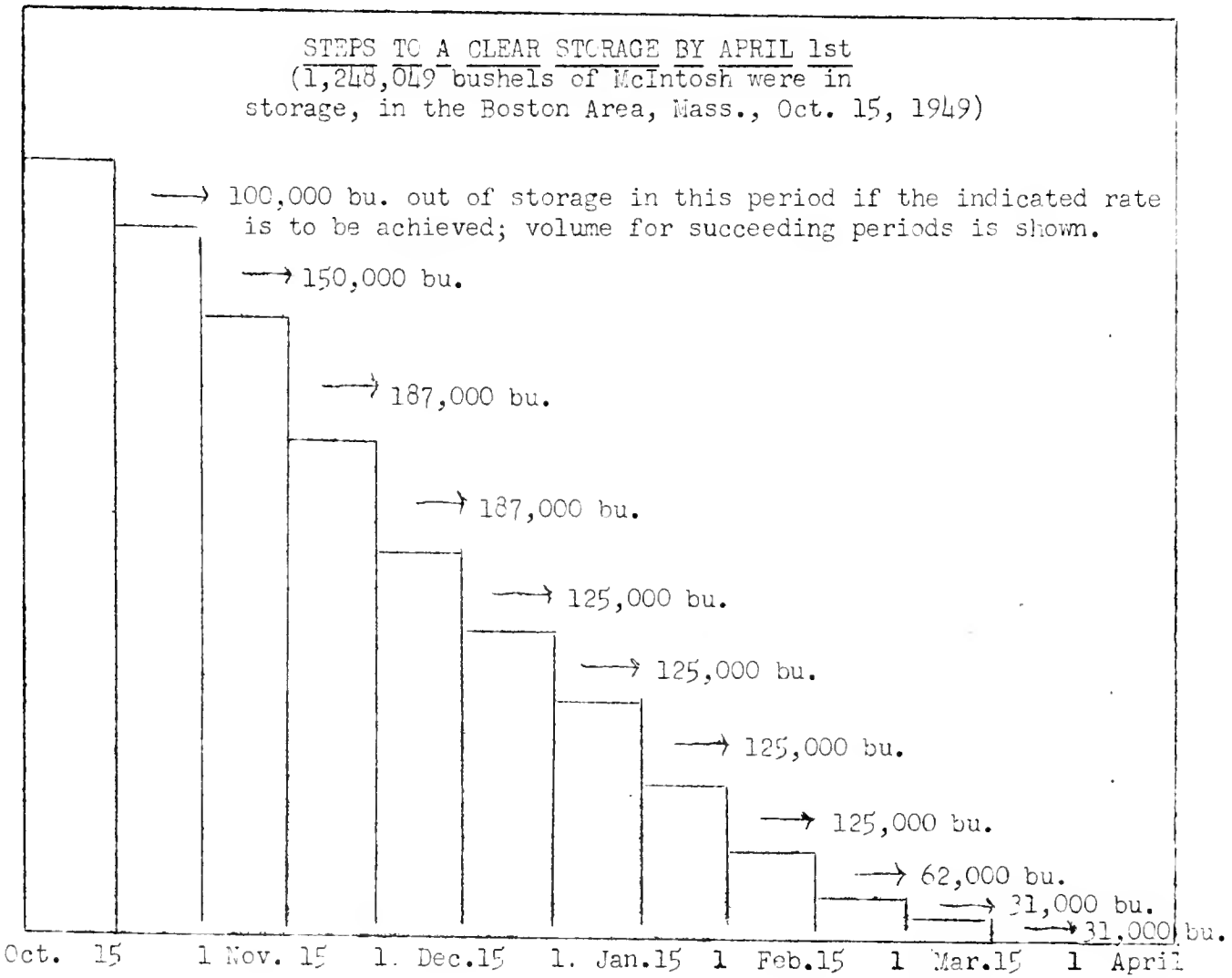
8. A window display of Baldwins in a prominent restaurant on Tremont Street where apples were used that would not have graded better than U. S. Utility. The fruit was not only poorly colored but blemishes due to leaf roller, curculio, and bud moth were plainly evident. Certainly, such as exhibit was no credit to the restaurant, the Baldwin variety, the fruit growing industry, nor the fruit grower who supplied the fruit.

Such a trip affords a splendid opportunity to observe both good and bad practices in the marketing process. While a few objectionable practices still persist, it is consoling to note that considerable progress has been made toward better marketing procedures compared with those of a generation ago.

-- O. C. Roberts

* *

MOVEMENT OF MCINTOSH OUT OF STORAGE



-- Frederick E. Cole

* *

POINTS TO BE OBSERVED IN THE PRODUCTION OF HIGH QUALITY CIDER

On a basis of the reaction of many consumers it would appear that greater care in the production and handling of fresh cider should make for a greater demand for this popular product. The following points are recommended as a guide for the production of good quality cider:

1 Cider is No Better than the Raw Material from which it is Made. Apples for cider should be ripe, but not over-ripe, sound, and clean. While cider is frequently made from second grade and cull apples, decayed or off flavored fruit will not make a quality product. Even a very few soft rots will impart a musty taste to a large volume of cider. The apples should be inspected and all fruit that shows evidence of decay should be discarded.

2. Apples should be Washed. Apples should be washed with clean water before they are ground. Washing removes dust and dirt which may impair the quality of the cider.

3. Several Varieties of Apples are Better than One. It is well known that a blend of two or more varieties of apples makes a better cider than a single variety. Blending is particularly desirable when a large proportion of McIntosh must be used. The addition of other varieties to provide added acidity and astringency is to be recommended. If available a small proportion of crab apples (up to 5 per cent) is effective in providing an added zest and character to cider.

4. Equipment Must be Kept Clean. The equipment should be thoroughly cleaned at the end of the day's operation. Dry press cloths should be soaked overnight in clean, cold water before using. Press cloths must be clean to permit a free flow of juice. At frequent intervals they should be boiled and then rinsed in cold water, or they may be washed and then soaked for several hours in a weak chlorine solution to kill microorganisms. Musty press cloths will impart a musty flavor to the cider.

   Press racks should be cleaned thoroughly and steamed daily. They should be at least partially dried before stacking. There is danger of "Souring" if they are stacked while wet.

   Clean equipment and premises inspire the confidence of consumers who visit the plant.

5. Clean Containers are Essential. The barrels or vats in which cider is held must be clean, otherwise off-flavors may be imparted to an otherwise high quality cider.

6. Cider may be Frozen. Cider lends itself to preservation by freezing. Freezing provides a means whereby fresh cider can be made available as a year-round beverage.

-- W. B. Esselen, Jr.

* *

Reminder on Mouse Control Where grass is heaviest there is greatest danger of mouse injury to trees. Placing properly treated baits in the active "runs" is recognized as a very effective way of dealing with the mouse problem. For full details consult your county agricultural agent. If you can prevent the girdling of even a single permanent tree, a few hours in surveying the situation and taking the necessary steps will be time well spent.

- - - - - - - - - - - - - - -

We Need Your Opinion What is your present estimate of these comparatively new apple varieties? ------ Macoun, Golden Delicious, Gallia, Milton. If you have any notion concerning the possibilities of any of these varieties under your conditions, please jot them on a post card and mail it to the compiler of FRUIT NOTES.. Items of interest are: Quality, Production, Market Demand and whatever advantages or disadvantages have come to your attention. Newer varieties will be ciscussed at one of the M.F.G.A. sessions in Worcester. A dozen opinions on post cards, in advance, will be very valuable.

- - - - - - - - - - - - - - -

A Note on Power Pruners A type of power pruner used quite extensively in the Far West, seems to have possibilities for Massachusetts growers. Some demonstrations are planned during the next few weeks. With adequate air pressure, branches 3/4" in diameter can be removed. For a drooping type of tree, such as Cortland, where many relatively small cuts on downward growing laterals should be made, this device is a real time saver. And although it is more expensive that others previously on the market it may have definite advantages. Operated from a home-made pruning tower, ladders are quite unnecessary.

- - - - - - - - - - - - - - -

Apple Pie Contest A statewide Apple Pie Contest will be held in January in connection with the Union Agricultural Meeting. Substantial prizes are being offered. For full details consult your county home demonstration agent. It is suggested that fruit growers encourage their wives to take part in the Contest. To allow a larger number of pies to be entered, a county contest is first being held in each county. The names of the county committee members responsible for development of these local contests may be obtained from your County Extension Office. The five winning contestants in each county will enter the statewide contest in Worcester next January. Among the judges is Mrs. Kay Mitchell of Wrentham, first prize winner last year. The other two are Miss Demetria Taylor and Mrs. Lucy Sheive, Home Economists for the N. Y. and N. E. Apple Institute and the N. E. Marketing Program, respectively.

- - - - - - - - - - - - - - -