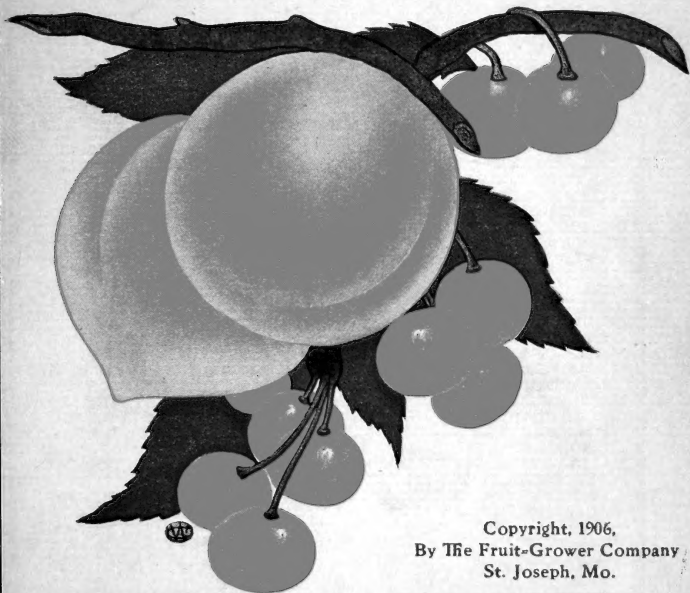


"BROTHER JONATHAN SERIES"—No. 10

SUCCESS WITH STONE FRUITS



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St. Joseph, Mo.

"Bro. Jonathan" Series of Fruit Books

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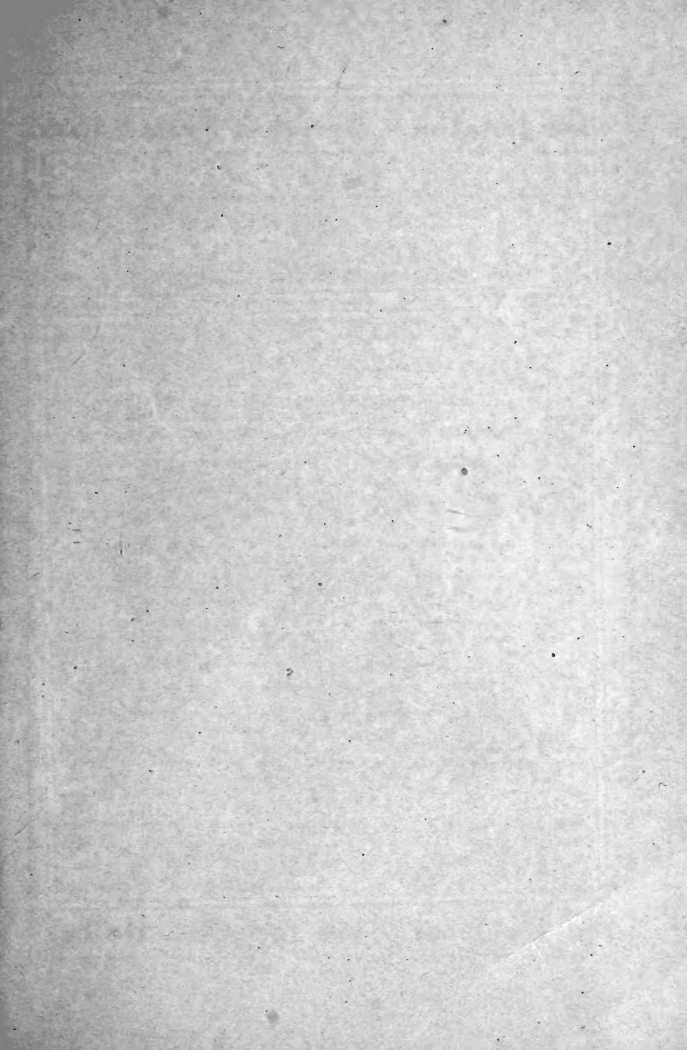
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No. 10—"Success With Stone Fruits."—By Prof. F. A. Waugh. The different stone fruits are treated, with lists of best varieties of each. Methods of planting, pruning, etc., are discussed for each class.

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Success With Stone Fruits

Including Chapters on the Planting and Cultivation
of Cherries, Peaches, Plums, Apricots, etc.,
with Description of Some of the
Best Known Varieties.

By F. A. WAUGH

Professor of Horticulture
Massachusetts Agricultural College

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Brother Jonathan Series



Booklet No. 10.

AUTHOR'S FOREWORD

In writing a pamphlet like this the problem of what to leave out becomes a very serious one. The author of this once wrote an entire book of several hundred pages on plums alone. An equal amount of space would be required to do justice to the peach. Yet here all the stone fruits must be treated in less than a hundred pages.

Brevity, besides being the soul of wit, has many other practical advantages; but in a case of this sort it has certain disadvantages. In such short space there can manifestly be given only the main general directions for the management of each class of fruit. The fine points, as one might say, have to be omitted. Yet it is precisely on these fine points that success rests.

Again it is necessary in a large country like ours, that practice should vary. Some things are done differently in Missouri from what they are in Massachusetts. These differences may be of great interest or even importance, but they can not be discussed in such a short book as this.

Still further, certain statements have to be made as general rules, which, though very good as such, are subject to local exceptions. But this booklet leaves no room for the exceptions. The author hopes that the reader will make due allowance for these limitations, and that in spite of them these chapters may arouse a greater interest in the culture of stone fruits, and at the same time give some hints for their more successful management.

F. A. W.

The Stone Fruits

The tree fruits, such as are grown in orchards, are sometimes divided into two classes: (1) The core fruits, and (2) the stone fruits. The first group contains the apple, the pear and the quince, all having a close botanical relationship, all much alike pomologically, and all requiring much the same treatment under cultivation. The second group, the stone fruits, contains the peach, the plum, the cherry, the apricot and the nectarine. These fruits also have many qualities in common, whether we consider the botanical relationships, their pomological characters or their cultural requirements. There is good sense therefore in the classification of our orchard species into core fruit and stone fruits, and good reason for treating the stone fruits all together in a single monograph.

Before taking up in detail the different varieties with their culture, it will be proper to present a few general facts regarding these various fruits. From this discussion all purely academic information will be ruled out. Botanical, morphological and historical facts, no matter how interesting, have little bearing on the culture and practical management of orchards. These things can be found in the encyclopedias.

The Peach

Unquestionably the most important of the stone fruits is the peach. It is widely grown in all civilized countries, particularly in North America, where from Ontario to Texas and from Delaware to California, it forms a commercial crop of prime consequence.

The different varieties of peaches will be described elsewhere, but at this point it will be best to point out that there are several different kinds or types of peaches, differing in marked characters from one another. The most recent classification of peaches is that published by the present writer in his *Systematic Pomology* (Orange Judd Co., New York), from which the following grouping is taken. This classification divides the peaches into five groups.

1. Persian Group—Typical peaches includes such varieties as the Crawfords, Oldmixon, Amsden, Alexander, etc. The fruits are nearly always more fuzzy and rounder than those of Group 2.

2. Chinese Cling Group—Including such varieties as Champion, Waddell, Hiley and Belle of Georgia. Elberta is usually classified here, but it seems to be a cross having a slight strain of the blood from Group 1. The foliage of these trees is lighter colored than in Group 1, and other slighter differences, easily recognized by expert fruit men, but difficult of description, make this group a comparatively distinct one. The varieties of this group are of rather recent introduction, but they have very quickly found a place in American horticulture. Elberta in particular has achieved a sudden and unparalleled popularity.

3. Honey Group—Fruit long and irregular in form, fruits long and corrugated. Grown only along the Gulf of Mexico, and not of commercial importance anywhere.

4. Columbia Group—Also a Southern group, being known in the Carolinas, Georgia and Texas and represented by such varieties as Columbia, Cobler, Lula, Texas, etc. Of little or no importance commercially.

5. Peen-to Group—Fruit characteristically flattened endwise, or oblate, though not all varieties show this formation. Flavor of the fruit sweet and peculiar. Tree usually not hardy. Adapted to extreme Southern latitudes, and expected to be of practical value in Florida, Southern Louisiana, etc.



The Plum

If the peach stands first, the plum is easily second in importance amongst the stone fruits. It covers a wider geographical range, though it is not so largely grown commercially. Certain kinds of plums are grown far to the north—as far as there is any form of agriculture. In fact the Americana and Nigra plums are the hardiest tree fruits known. Plums are also grown as far south as any of the tree fruits of the temperate regions. Plums are also adapted to a wider range of soils than any other fruits, and also to a greater diversity of culinary uses. In fact the plum may fairly be called the most versatile of fruits. The cultivation of the plum is largely shrouded in ignorance, so that successful plum culture is rather rare; but that is another matter.

One prime reason for the great diversity of qualities in plums lies in the fact that they are derived from several different botanical species. While all the cultivated apples are derived from one original wild species, the plums are derived from a very large number—somewhere from ten to fifty, depending on what sort of a classification we make and what varieties we are counting in. The principal groups are named below, but this classification is horticultural rather than botanical.

1. European or Domestica Group—These are the “old-fashioned” plums, the progenitors of which were brought from Europe by our forefathers. The group has been long in cultivation, being one of the most ancient of fruits, and has many different forms. Seven principal types have been recognized, subordinate to the general species. These are (1) the

Reine Claude type, (2) the Dame Aubert type, (3) the Prunes, (4) the Perdrigons, (5) the Diamond type, (6) the Bradshaw type, and (7) the Lombard type. These varieties are largely cultivated under the name of prunes on the Pacific slope, and as plums in the Eastern states and Canadian provinces. They do not succeed well in the prairie states nor in the South.

2. Damson Group—The small damsons, nearly always dark blue in color, are known to every fruit-grower. They have considerable commercial value in sections where they can be grown.

3. Myrobalan Group—The Myrobalan or cherry plums are seldom grown for fruit in this country, but are very extensively used as stocks on which to bud other plums.

4. Japanese Group—The Japanese plums, probably originally native to China, have been generally planted in America only during the last twenty-five years, but they are now widely known and in many places very popular. The trees are more peach-like than those of the *Domestica* plums, are somewhat less liable to black knot, are more rapid growers, and come earlier into bearing. This early bearing habit is a strong recommendation for the Japanese varieties, though it seems to be offset to some extent by the comparatively early failure and death of the trees. There are several different sub-types of the Japanese plums. Six of these can be somewhat easily recognized, as follows: (1) the Botan type, (2) the Red June type, (3) the Satsuma type, (4) the Kelsey type, (5) the Hale type (6) the Berger type.

5. Gonzales Group—This group of plums has originated by the hybridization of the Japanese varieties with the natives, particularly with native vari-

eties of the Wildgoose and Chicasaw groups. It contains such varieties as Gonzales, Waugh, Golden, Yates and Red May. These are especially adapted to middle and southern latitudes, for which they seem to offer great promise.

6. Omaha Group—This group originates through the hybridization of the Japanese varieties with the Northern native plums (Americanas). Up to the present time no varieties of commercial importance have been introduced.

7. Wickson Group—These varieties are hybrids of the Japanese plums with the Simon plum, *Prunus Simonii*. They have an upright habit of growth, and the fruit usually has a peculiar musky flavor. Wickson, Climax and Bartlett are typical varieties. Wickson has been widely planted, but the group as a whole has not proved to be a commercial success.

8. The Simon Plum—Only one variety of this species, *Prunus Simonii*, is known in this country. It is a very upright tree, with oblate early fruit. It is grown in small quantities, especially in California, for a very early shipping plum.

9. Americana Group—These are the plums native to the Central states and especially prominent in Iowa, Missouri and Kansas. They are very hardy and prolific, and can be grown in many sections where practically no other fruits, especially no other plums, will succeed. Such varieties as Wyant, De Soto, Weaver and Wolf belong to this group.

10. Nigra Group—This is a Northern and Eastern form of the foregoing. It is of much less importance horticulturally, though a few varieties are derived from it, such as Aitkin and Cheney.

11. Miner Group—The Miner group is closely related to the Americas, from which they hardly

need be separated for practical purposes, as they behave in the same way. Miner is the best known representative.

12. Wayland Group—Native to the Southern states, especially Texas, where these varieties are of considerable value. Golden Beauty and Wayland are the best known.

13. Wildgoose Group—Sometimes called the Hortulana plums. These are found wild in the Central Mississippi Valley, and are the best of all plums for orchard growing in many central latitudes. Milton, Wildgoose and Whitaker are the commonest varieties.

14. Chicasaw Group—The Chicasaw plums inhabit low lands or sandy stretches in the Southern states. They form small thorny trees or bushes, nearly snall red, sweet, watery fruits. Some good orchard varieties have been derived from them, like Pottawattomie, Munson and Clifford.

15. Sand Plums—These grow wild along the Western rivers, especially the Arkansas, the Cimarron and the Republican, usually on sand plains or hills. While they are among the best wild plums known, they have never amounted to much under cultivation. There are a few budded varieties, but none which can be recommended for orchard planting.

16. Miscellaneous—Even the foregoing 15 groups do not include all the known plums. There are several other species which furnish edible fruit, and which are more or less worthy of domestication. The most important of these species are those known botanically as *Prunus subcordata*, *P. maritima*, *P. gracilis* and *P. alleghenensis*. There are also many hybrid plums coming into notice at the

present time, some of which are hard to classify by reference to any of the foregoing groups. While all this seems complicated, it is really not so bad as it looks. It is not hard to understand the comparatively few varieties commonly cultivated.



The Cherry

There are various types of cherries recognized by the pomologists, but for all practical purposes these may be reduced to two, the sweet cherries and the sour.

Sweet cherries usually have larger trees than the sour varieties, with larger rough foliage, usually with larger, sweeter fruits. Formerly these used to be grown to some extent throughout the Eastern states, and occasional old trees are still frequently seen. However, they bear very little fruit, most of which is taken by the birds, the curculios and the fruit rot. Their cultivation is so precarious that very few men undertake it. The sweet cherry is grown commercially now only in a very restricted area in New York state and on the Pacific coast. In the Pacific states it is sometimes profitable, but elsewhere it may be looked on more as a curiosity than as a money crop.

Sour cherries on the other hand thrive fairly well in nearly all the Northern states, and as far south as Maryland and Kansas. Certain varieties can be grown with success in the colder parts of Canada, so that altogether the sour cherries have a fairly wide range. Indeed, they are grown over almost the same geographical area as the apple. The trees are small, sometimes even dwarfish, with slender branches and smooth leaves. The fruit is small, black or red, very tart, but very rich when ripe. Representative varieties are Morello, Richmond and Montmorency.

The Apricot

Two or three different species of trees bear fruits which are called apricots, but the commercial varieties are mostly considerably alike. Apricots are grown commercially only in small areas in California, and there largely for canning. The tree and fruit are about midway between those of the peach and the plum, but they do not possess any distinct advantages over either. Men who like to have all kinds of fruits in their gardens plant apricots to keep up the diversity, but men who are trying to make money out of fruit-growing, mostly top their ventures with some other fruits.

The Nectarine

The nectarine has often been described as a smooth skinned peach, and this is a very satisfactory characterization. The nectarine in fact is very closely related to the peach—so closely that peaches and nectarines have not infrequently been found growing on the same trees. In other words the nectarine is often merely a bud variation from the peach. Doubtless some varieties have occurred also as seed variations; but it is said that if one plants the seed of nectarines the offspring will be mostly peaches. The writer is ashamed to report that he has never tried so simple and so interesting an experiment. The tree of the nectarine looks exactly like that of the ordinary peach, and the fruit has the same general appearance and taste. Well-grown nectarines are very fine dessert fruit, and it seems odd that in a country where peaches are grown by train loads, as in America, nectarines should be almost unknown.

Culture of the Peach

The peach may be propagated in various ways, but in practical business only two are used. Peach trees are grown from seed or from buds. In the first stages of fruit growing in nearly every section, peach orchards were grown from seed. The seedlings do not come true to variety and so these orchards had a mixture of big peaches and little ones, yellow and white, freestone and clings. They served a useful purpose in their day; but with the establishment of commercial peach growing they were forced quickly to give way to orchards of named and budded varieties.

Peaches are still extensively grown from seed everywhere, but only to be used as stocks for propagating named varieties. The seedlings are budded to the varieties desired. There are two principal sources of seed. A large majority comes from the canning factories, and considerable amounts are collected from half-wild seedlings, especially in North and South Carolina. Some of the best peach seed the writer has ever used was collected by the Department of Agriculture in Mexico.

Whatever source the seed comes from, it is taken as soon as it is partially dry and either stratified or planted immediately. It is desirable that the seeds should not become stone dry. If the seed is to be planted in the fall, two precautions are important. The first is that the soil should be clean and well drained so that water may not stand on it during the winter; and the second is that mice and moles should not be too numerous. These little rodents often follow rows of peach seed and clean them out almost entirely during the winter and spring. It is

on account of the danger from them that the seed is more often stratified than fall planted.

The stratification of the seed simply consists of burying it in a safe place where it will freeze during the winter. The freezing is sometimes said to be necessary. It is not absolutely essential, but is beneficial, especially in that it bursts the stones. When this stratification is carefully performed, it consists of placing the seed in a shallow wooden box or flat. Into such a box a layer of coarse sand is sifted; upon this is spread a layer of peach pits; then another layer of sand is put in; then a layer of peach pits; and so on until the box is full. This box is then buried in a well drained place where it will freeze, and in the spring the seed is sifted out of the sand and planted. The peach pits are sometimes loosely buried in the soil without the special pains of stratification as described above. It is largely a question of convenience and the price of labor.

Whether the seed is planted in fall or spring, it is usually run in rows about three and one-half feet apart, offering proper opportunity for horse cultivation. The seeds are planted thickly in the rows so that the trees will stand on an average of three inches apart. Light, well-drained land should always be chosen for the peach nursery, but it should not be sterile nor too dry.

If necessary a fairly liberal fertilization should be given. It is important that a vigorous growth should be secured during the two years during which the trees occupy the soil. If the ground has to be fertilized, it is best to apply a liberal dressing of barnyard manure before planting the seed. A spring top dressing of fertilizer rich in nitrogen and potash may be given if required the first year. In

most cases such a top dressing is still more valuable if given the spring of the second year, that is, the year during which the budded trees make their heads.

The real propagation of the peach is carried out by means of shield budding. This practice has been so often described that it seems hardly necessary to go into it here. In the common method the work is done sometime from the last of July to the last of September, depending on the locality and weather. It is necessary that the stocks should have reached a suitable size. They should be as large as a lead pencil or larger.

The stocks must also be in such a condition that the bark will slip, as the budders say. The stock is prepared by stripping off the leaves near the ground and by making two incisions at right angles to one another forming a T. These cuts are made as near the surface of the ground as possible. The vertical cut should be one and one-half to two inches long and the horizontal cut across the top of the first incision should reach one-third to one-half the distance around the tree. The two corners of bark thus formed may be easily lifted and the bud which is to be inserted is slipped down behind them. The buds are prepared as follows: The operator goes to the tree of the variety which he wishes to propagate, say Elberta or Champion. On this tree he selects strong clean shoots of the current season's growth, being careful, as far as possible, to avoid those which have fruit buds. These shoots are cut off and form his "budding sticks." The blade of each leaf is immediately cut off, leaving only the short leaf stalk or petiole. When the bud is to be inserted, the knife is run under it beginning about one-half an inch below the bud and coming out one-quarter of an inch

above it. Thus each bud with the little leaf stalk attached forms a sort of a shield, from which the process gets its name of shield budding.

This little shield is inserted in the opening already made on the stock and is tied in place with some soft material. Raffia is now almost universally used. Raffia may be secured of any seedman or nurseryman, and costs about 15 cents a pound.

The buds are almost always inserted on the north side of the stock in order to protect them somewhat from the hot sun. A good budder can set two to three thousand buds a day. Some budders claim to be able to set five thousand buds a day, but one thousand five hundred is commonly looked upon as a day's work. It is understood that the stocks should be prepared and the buds tied in by a helper.

After about ten days the stocks should be examined. By this time it may be determined how many buds have taken. Usually the rapid growth which the stock makes at this time of the year causes the tie to bind inside of ten days. As soon as this binding begins to show the raffia must be cut. If the weather is favorable it is possible at this time to rebud any stocks which have failed to take.

The following spring the nursery is gone over again and each tree is cut back just above the inserted bud. This particular bud should be pushed immediately into growth. The nursery needs to be gone over once or twice soon after growth starts in order to rub off other buds which start from the stock so as to favor the buds which have been inserted.

After one year's growth in the nursery, the trees are ready for transplanting. Two-year-old peach trees are hardly worth handling. When the trees are not required the first year they are sometimes

cut back to within two or three inches of the ground and are allowed to make a new growth the second year as much like the first year's growth as possible. This is the best way to handle them if they are to be kept at all.

Another method of propagating peach trees, considerably practiced in recent years, is called June budding. This differs from the method already described only in the fact that the buds are set early in the season, usually in June, and are allowed to make growth the same year. One year is thus saved in the propagation of the tree, but a tree budded in June will necessarily be smaller when ready for market in November than the ordinary one-year-old peach tree which was budded a year ago the previous August. In case of emergency, there is no objection to using June budded trees, but they are not to be generally recommended.

CLIMATE AND SOIL

The peach thrives over a wide area of the North American continent. It is less hardy than the apple and keeps more southern latitudes. Still peaches are successfully grown as far north as Massachusetts, New York, and Ontario and they are commercially successful as far south as the orange belt. During recent years there has been a strong tendency to develop peach growing in certain special localities, particularly in Georgia and Eastern Texas. Michigan, Maryland, Delaware and New Jersey are still generally known as important peach growing states.

It may be remarked in passing that these extraordinary extensions of the peach industry seem likely to be overdone. The margin of profit is none too large at present. When some of the great orchards now being planted come into full bearing, it is plain

that someone will lose money. Only the men who are in a position to grow and handle the fruit most cheaply can stand the enormous competition which is likely to result.

The peach prefers a comparatively light soil. A coarse sand or a sandy or gravelly loam, if it contains a reasonable amount of fertility, is always good. Heavy clay lands are inadmissible. Something can be done, at least in an amateur way, toward adapting peaches to heavy soils by propagating them on plum roots. If some slow growing species of plum is used the peach tree is dwarfed to a certain extent. This is desirable also for private gardens, and dwarf peach trees seem likely to be in greater demand in the future for such uses. The sand cherry seems to make a specially effective stock for dwarfing the peach or nectarine.

PLANTING

Peach trees are planted at all seasons of the year, depending somewhat on the soil and climate, but still more on the personal prejudices of the planter. In Georgia and Texas, January is a favorable month. For planting in Northern climates, spring planting is usually preferred. Where the soil is good and the winter weather apt to be not too rigorous, fall planting is reasonably safe.

There has always been some discussion as to the proper distance apart for peach trees. The tendency now is to plant closer than formerly. Mr. Hale's famous orchards in Georgia have the trees set thirteen feet apart each way. Fifteen feet apart may be regarded as ample space for trees which are to be systematically pruned. Twenty feet each way is the maximum distance.

The soil should be in a reasonably good state of cultivation before the planting begins. Supposing it to be in good condition the planting can be largely



A Model Low-Headed Peach Tree.

done by team work. The customary way is to open out a deep furrow where each row is to stand. This is done either with a lister which may be run twice

in the same furrow, or with a large plow run both ways, thus opening up a deep dead furrow. This furrow for planting should be six to eight inches deep. The land is then marked off crosswise at right angles to these furrows, showing where each tree is to come in the row.

The planting is done by three men working together. One of them carries an armful of trees already pruned for planting. At each intersection he sets up one of these trees in the place which it is to occupy. The tree is located carefully in the row by the other two men, one of whom sights in one direction while the other sights along the row at right angles. These two men who have thus helped locate the tree which the first man carries, now step up with the shovels which form their equipment, and quickly cover the roots of the tree with two or three shovelfuls of earth apiece. This is tramped in place by the first man. Not more than fifteen seconds is required for all operations here described, and then the three men move on to the next tree. It is not necessary that the tree should be fully covered in with the shovels. As soon as the orchard is gone over in this way, the furrows are filled by plowing back with the plow, thus banking up against the trees and completely filling in.

It is a matter of much convenience to have the trees properly pruned before taking them into the field. The best planters nowadays practice much more severe pruning than they did formerly, though very few of them go to the extreme known as the Stringfellow method. The usual practice is to cut off all straggling roots and to leave none of the main root branches more than three or four inches long. The larger or longer roots do no good. The top is usually cut back to a straight stick not more

than two feet long. Eighteen inches is better. Some men prefer to cut trees down even as low as twelve inches. This is largely a matter of taste and of the methods to be subsequently followed. This pruning of the trees can be done much better in the shed before planting than in the field after planting. It greatly facilitates the work of setting out trees.

CULTIVATION

There has been a good deal of argument in recent years as to whether it is better to cultivate an apple orchard or leave it in grass. But very few fruit growers have gone to the length of recommending grass for a peach orchard. Good annual cultivation is considered the best practice. In very rough land this rule may be mitigated, but for the most part some substitute for cultivation is undertaken.

The best cultivation consists of a light plowing of the soil in the spring as soon as the land is dry enough, followed by frequent scarifications of the surface with such tools as the Acme cultivator, disk harrow, spring toothed harrow or the ordinary smoothing harrow. The nature of the soil chiefly determines the character of the implement to be used. The best peach growers cultivate their orchards at least once a week during the middle of the summer and up to the ripening of the fruit. The drier the weather, the more frequent thorough and long continued should the cultivation be. If the weather is excessively dry this surface cultivation should be carried on until picking time. If the weather is not too droughty, cultivation can be suspended earlier, usually about July 1.

In most orchards it is thought best to sow a cover crop at the time of the last cultivation. Various

plants have been tested and recommended for cover crops, but those most useful with peaches are cow peas, crimson clover, mammoth clover, vetch, soy beans, and buckwheat. Cow peas are best for southern climates. Crimson clover is best for medium latitudes and poor soils, while soy beans, vetch or buckwheat seem to be best for the northern orchards.

In planting either cow peas or soy beans it is best to sow the seed in drills about three feet apart, allowing for one or two cultivations after planting of the cover crop. Clover, vetch or buckwheat may be sown broadcast. A liberal allowance of seed should be used in planting any cover crop for two reasons: (1) germination is likely to be poor at this time of the year, (2) a heavy stand is desired.

A cover crop is valuable in many ways. Some of its various services are as follows: (1) to add humus to the soil, (2) to add nitrogen to the soil, this service being rendered chiefly by the leguminous plants, (3) to prevent freezing of the tree roots during the winter, (4) to prevent erosion or soil washing. This last is of great importance on some soils.

It may be pointed out that some truck crop may be grown between the rows of peach trees during the first two years of the life of the orchard. Just what crops shall be selected for this purpose will depend on the locality and market. They should always be such crops as require cultivation. Irish potatoes, sweet potatoes, musk melons, cucumbers, beets, cabbage, cauliflower, may be specifically named. Whenever such crops are grown, however, care should be taken that they do not rob the soil of the fertility which should go to the growing peach trees. A liberal amount of fertilizer should be given for a truck crop. It is not at all uncommon to see peach

orchards ruined, or at least severely injured, by this stealing of plant food during the early years of tree growth. Unless the trees make good growth and form vigorous, thrifty tops during the first two years, the peach orchard might almost be as well abandoned.

FERTILIZATION

Considerable care is necessary in fertilizing peach trees. It is important to encourage vigorous growth during the first four or five years. After that the trees should be kept in good condition, excessive growth being avoided. During the first four years the average annual growth should not be less than twelve inches and may be thirty-six inches in good soils. The best test for the condition of a peach tree, however, is the color of the foliage, which should be a rich and dark bluish green. The leaflets should be large and somewhat crinkled. If the foliage is sparse, small and yellow, the trees need attention, either in the way of cultivation or fertilizers, or both.

While the trees are young they need fairly liberal supplies of nitrogen in order to keep up vigorous growth. After bearing begins the amount of nitrogen should be reduced and the potash considerably increased. Barnyard manure should be used in moderate quantities, especially in the early years of growth. Commercial fertilizers are more suitable to peaches than perhaps to other fruit. Of course the amount of fertilizer used in every case will be governed largely by the natural fertility in the soil.

In using fertilizers to promote wood growth, special attention should be paid to the value of early growth as compared with late growth. The objection to barnyard manure is that it gives up its ni-

trogen slowly throughout the year and is likely to keep the shoots growing until late in the fall. It is important that the wood should be allowed time to ripen. If it does not harden well it is almost sure to be injured during the winter. On this account nitrate of soda is particularly useful on peach trees. It can be applied early in the spring and will be used up long before midsummer. Voorhees recommends a mixture of three parts ground bone and two parts of muriate of potash for peach trees to be applied in annual dressings of five hundred to fifteen hundred pounds as required. This fertilizer would contain 2 percent nitrogen, 13.6 percent total phosphoric acid and 20 percent potash. It may be mixed at home and is very rich, especially in potash. This is better adapted to fruiting trees than to newly planted orchards. Van Slyke recommends a fertilizer made up of fifty pounds of nitrate of soda, one hundred pounds of dried blood, two hundred pounds of cotton seed meal, six hundred pounds of acid phosphate, two hundred and forty pounds of muriate of potash. This is more evenly balanced and comes nearer being a general purpose fertilizer. It contains 2.7 percent nitrogen, 7.5 percent phosphoric acid, and 10.1 percent of potash.

PRUNING

Intelligent pruning is more important in handling peach trees than in growing apples. At least more careful and strict attention must be given. Pruning should begin the first year the trees are put out and should be continued annually. While some apple growers skip one or two years occasionally without pruning and suffer no apparent ill effects from it, the rapid growth of the peach tree makes such carelessness very dangerous.

The first problem is the formation of a proper head. The vase form is practically the only one of general utility. Suppose the tree to be headed back to a clean stem eighteen inches long when it is set out. If the season is good and the soil reasonably rich, a strong growth will be made the first year and there should be formed from three to six strong



Peach Tree Severely Headed Back.

branches. The ideal number is four. The first spring after planting, the trees are very carefully gone over with the pruning shears. Three to five branches are selected as symmetrically placed as possible about the trunk. The others are cut clean away. The branches chosen, of which the ideal number would be four,

are cut back so as to be approximately of equal length. This length may vary from six inches to three feet, depending on the vigor of the tree, but in a moderately good tree it should not vary much from twenty inches.

The succeeding spring the trees are gone over again and the frame work which was begun at the end of the first year, is filled out so as to give the tree its desired vase form as nearly as possible. Upon each one of the four branches left the first year two or three branches are now allowed to remain. These are all cut back to a length varying from three to eighteen inches. The author prefers cutting to six or eight inches at this time.

It should be said that the formation of the head will be greatly facilitated by a certain amount of summer pruning, usually done the first week in July. At that time green shoots may be removed by hand, thus favoring the growth of more desirable branches. This summer pruning is especially valuable during the second year.

The third year's pruning is very much like the second. If anything the year-old shoots should be cut back more severely than before. The writer is aware that the pruning here prescribed is more drastic than what is usually practiced, but experience has shown it to be successful.

After the heads are formed and the trees are bearing fruit, a somewhat different system of pruning is required. Heading in has become still more important, but rather more difficult to carry out. At the spring pruning one has to estimate the cutting back somewhat by the number of fruit buds in sight. If the tree is prepared to bear a crop there must of course be left fruit buds enough for this purpose.

Ordinarily the fruiting shoots can be cut back half their length. This will be an advantage not only in



A High-Headed, Unpruned Peach Tree.

restraining the growth of the tree, but also in thinning the crop of fruit. At the same time all weak,

straggling, broken or otherwise imperfect shoots should be removed altogether or if they are favorably placed they should be cut back to two buds.



**A Low-Headed Peach Tree, Pruned Back
the Previous Spring.**

Especially on old trees it is always desirable to open up the heads by more or less cutting out of this kind every spring.



Twigs from Pruned and Unpruned Peach Trees.

In case the crop has been lost by winter freezing or late spring frosts, it is nearly always best to take advantage of the opportunity to head in the tree rather severely. Experiments conducted by the writer agree with the general experience of peach growers that such heading in may go to the extent of taking out practically all the one-year-old wood. If the tree is not seriously injured, it is safe to cut back into two or even three year old wood rather freely. If the tree is very weak it will not bear such severe cutting, however, and the pruning should be confined to the removal of the one-year-old wood down to within three or four buds at the base of each shoot.

Some summer pruning on old trees, especially when they are in vigorous condition, is desirable. It should be given the first week in July or the last week in June. This consists in the removal of weak shoots which are choking up the center of the tree. Heading in of vigorous growing shoots at this time of the year is not to be recommended.

DISEASES AND INSECTS

The principal diseases attacking the peach are the yellows, leaf curl and the brown rot.

The best treatment for the yellows is to dig out and burn every affected tree just as soon as discovered. It is not usually safe to replant with peach in the same spot, at least for several years. The infection of the yellows seems to remain in the soil and to attack the new tree.

Leaf curl is very bad in some sections, not infrequently defoliating the trees entirely in mid-summer. Using strong Bordeaux mixture early in the spring before the leaves start is especially rec-

ommended. A second application should be given just before the blossoms open.

The brown rot or monilia, which shows itself chiefly on the fruit, but which also attacks the shoots and foliage, may be repressed to some extent by treatment with Bordeaux mixture already recommended. Careful pruning of the tree and careful thinning of the fruit also tend to mitigate the ravages of this disease. Gathering and burning the diseased fruit as soon as the disease appears may be worth while, or it may not. It depends largely on circumstances, especially on the value of the crop, and the cost of labor.

The principal insect attacking the peach are the borer and curculio.

The peach borer attacks the trunks especially at or just below the surface of the ground. Digging the insects out with a sharp knife or killing them with a wire is one of the best remedies and is always recommended where the borers have gained lodgment. Something can be done to check the attacks of the borer by drawing the soil away from the trunks of the trees in the fall and banking it back rather high in the spring. Various nostrums are advertised for killing peach borers, but are usually of small account.

PICKING AND MARKETING

Picking and marketing peaches is discussed fully in the Brother Jonathan Series No. 5. We may simply point out here that the principal packages for handling peaches are the Georgia six-basket carrier, the Jersey peach basket, and the Climax basket.

The Georgia carrier is the best for long distance shipping. It contains three four-quart baskets be-

low, separated from three similar baskets above by a slat staging. These crates cost from fifteen to twenty dollars a hundred, complete.

The Jersey basket is very satisfactory for local markets or short shipments. It is made in various sizes holding from four to sixteen quarts. The sixteen quart or half-bushel size is most commonly used and is to be recommended.

The Climax peach basket holding one-fifth or one-fourth of a bushel is used in some sections, particularly in Michigan. It is a good package for fancy fruit or for long distance express shipments where refrigerator car service is not employed.

The commercial peach crop is now largely handled in refrigerator express cars. This makes it very difficult for small growers to reach a distant market with any satisfaction. It usually costs them more to ship their fruit in unrefrigerated general express cars and when it reaches the market it has to compete with fruit in much better quality brought in by refrigerator service.

VARIETIES

There are a great many good varieties of peaches. So many that it is impossible to describe half of them here. For the most part, however, the planting of new orchards is confined to a few varieties. More than half the trees planted the country over during the last five years have been of a single variety—Elberta. In many sections this one variety has constituted over nine-tenths of all the plantings.

In selecting varieties for market only a few should be chosen. Two varieties for a small orchard and three for a moderate sized orchard are about right. Of course large commercial enterprises, covering

hundreds of acres, can handle several varieties; but it is a good rule to choose one or two good sorts and to push them for all they are worth.

In the home garden the selection of varieties should be given much wider range. There should be one or two trees of almost every good variety which the local nurseryman can supply. There should be early and late sorts, yellow and white sorts, freestones and clings.

It seems worth while to draw special attention to the white peaches. There has long been a prejudice in favor of the yellow-flesh fruit, but this is now disappearing to some extent. The real connoisseurs have long picked the white peach for their own eating, and as the public gets more peaches and learns better what to choose, the preference for the white fruit spreads. This preference has recently received a special impetus through the introduction of several fine new white-fleshed varieties of the Chinese Cling group—particularly Waddell, Champion and Belle of Georgia.

The following list comprises the varieties principally grown:

Alexander—White, semi-cling, medium size, white with red cheek, quality fair, very early.

Beer's Smock—Yellow, free, medium to large, oval, yellow marked with red, quality fair, late.

Bequett Cling—White cling, size medium to large, season medium early.

Bequett Free—White, free, size medium to large, medium early.

Bilyeu—White, free, size medium, round, quality fair, season very late.

Brandywine—Freestone, size large, quality fair, medium early.

Chair's Choice—Yellow, free, size large, quality good, season medium.

Champion—White, free, size large, quality good, season medium.

Chili (Hill's Chili)—Yellow, free, small to medium, quality fair, early.

Chinese Cling—White, cling, large to very large, quality good, season medium. Notable as the type of a new group of peaches.

Columbia—Yellow, free, medium size, fair quality, medium, late.

Crosby—Yellow, free, small to medium, quality fair to good, season medium to late.

Early Crawford—Yellow, free, medium to large, good quality, early to medium ripening. One of the most popular early varieties.

Elberta—Yellow, free, large, quality fair to good, midseason or a trifle later. Certainly the most popular and profitable variety now known, but has been so much planted that it should be generally avoided by market growers now setting new orchards.

Emma—Freestone, large, quality good, medium late.

Fitzgerald—Yellow, free, size medium, quality fair to good, rather early. This variety has been highly recommended of late for planting in northern latitudes on account of the hardiness of the tree.

Foster—Yellow, free, very large, good, indeed one of the best; midseason.

Belle of Georgia—White, free, medium to large, quality good to extra good, season medium late. One of the best new varieties.

Greensboro — White, semi-free, large, medium quality, moderately early.

Hale—White, semi-free, small, quality fair, early. Formerly popular, but not much planted now.

Heath Cling—White, cling, size large, quality best, very late. A fine peach, especially for canning.

Hiley—White, free, small to medium, good, early. A good early market sort.

Hynes (Hynes' Surprise)—White, semi-free, size small, quality fair to good; late.

Kalamazoo—Yellow, free, size medium, quality good, medium early.

Late Crawford—Yellow, free, large, quality good to best, late. One of the most popular varieties, but now largely supplanted by Elberta.

Lemon Cling—Yellow, cling, size large, quality best, mid-season. A very fine peach, and used for canning, especially in California.

Lemon Free—Yellow, free, large size, quality good, late.

Mamie Ross—Yellow, cling, medium size, quality good, early.

Mountain Rose—White, free, size medium, quality good, early.

Old Mixon—White, either free or cling, large, good quality, medium late. Two varieties are sold under this name, one cling, the other nearly freestone. To be more exact we might say that Old Mixon varies very greatly, so that there are really several varieties passing under this name. Now being supplanted to some extent by Belle of Georgia.

Rivers—White, free, medium size, good, early. This is an old English variety, formerly popular.

Salway—Yellow, free, size good, quality moderate, late.

Smock—Yellow, free, medium size, quality fair to good, season late.

Sneed—White, cling, medium size, quality poor, very early. Planted to some extent on account of its very early ripening, but is not worth growing.

St. John—Yellow, free, size medium to large, good, early.

Stump—White, free, large, good, medium late.

Thurber—White, free, medium size, good, early.

Tillotson—White, free, medium to large, good, early.

Triumph—Yellow, semi-cling, small, poor quality, early.

Troth—White, free, small, poor. medium early.

Waddell—White, free, early or medium. A good early market sort.

Waterloo—White, semi-cling, small, fair quality, very early.

Wheatland—Yellow, free, large, good, mid-season.



The Plum

The plum has certain advantages over the peach. It can be grown over a wider range of territory. It fills a longer season. It is adapted to more diverse uses. It ought to be more widely grown. If plums could be properly presented to the general market, the demand for them would be greatly increased.

PROPAGATION

The plum is propagated from seed, by buds, and by grafts. It may also be propagated in other ways, but these three methods are used commercially.

Plums do not come true from seed except in rare cases. The seedlings are grown therefore either to secure new varieties or to furnish stocks upon which named varieties are budded or grafted. Plum seed is rather hard to secure in commercial quantities. The usual source of supply is France.

Plum seeds are handled exactly like the peach seed. That is, they are either planted in the fall where the nursery rows are to be, or they are stratified until spring, when they are planted in the same way. This stratification or burying of the seed is practiced exactly as described for the peach.

On account of the difficulty of securing seed, very few nurserymen grow their own stocks. These stocks are largely imported from France. The chief exception to this rule of buying stocks comes in the practice of budding plum on peach roots. The peach makes a first rate stock for plums, especially on light lands and in southern latitudes. The peach seedlings are grown in nursery rows exactly as when they are to be budded with peach buds. At

the proper time they are budded instead with the desired varieties of plums.

There are many different kinds of stocks used for plums in this country, having very diverse characters. It is important that some note should be made here of these different kinds. The most important stocks are as follows: Myrobalan, peach, Mariana, Americana, Apricot, and sand cherry, named approximately in the order of their use. The Myrobalan stock is the one chiefly imported from France, and the one best adapted to the propagation of all kinds of plums. The peach stock is grown from seed in the nurseries where it is to be budded, as explained above. The Mariana is grown from cuttings in the Southern states and claims cheapness as its chief advantage. The Americana stocks are grown from the seed of native plums and are used chiefly in the prairie states. They make excellent stocks, especially for native plums. They have a considerable dwarfing effect upon the varieties of the Japanese or *Domestica* groups. The apricot stocks are used to some extent, especially in California, where the apricot seed may be secured cheaply from the canneries. They have about the same value as the peach stocks. The sand cherry has not been used much except in an experimental way, but has been shown to have important good qualities. It makes good trees in the nursery and the plums rooted upon it are hardy. It also has a marked effect in dwarfing most varieties of plums, and is indeed the most promising dwarfing stock for this class of fruit.

In the majority of nurseries plums are shield-budded in precisely the same manner as described for budding the peach. The work is done at the same time of the year except that certain stocks,

specifically the Americana and sand cherries, require early budding. June budding is occasionally practiced with plums, but is less successful than with peaches. The only varieties for which June budding can be at all recommended are those of the Japanese and Japanese hybrid classes.

Grafting is sometimes employed in the propagation of plums. Where it can be conveniently used, it is altogether satisfactory. Some nurserymen regard it as a cheaper and safer method of propagation than budding. For the most part the practice of propagating plums by grafting is confined to Minnesota, Iowa, North Dakota and that region generally where the Americana stock is used. The work may be done either by the whip graft method or by side grafting. In either case the grafting is done in the cellar during November, December, and January, and the grafts are laid away in moist sawdust or are buried in sand until spring. They are then planted out in nursery rows four to six inches apart and are given good cultivation until they are ready for transplanting.

Plum trees are transplanted at one or two years old, very seldom at three years old. The strong growing varieties of the Japanese and Japanese hybrid groups are best transplanted when one year old from the bud. This applies also to the strong growing nursery trees of the Wildgoose group and in some cases also to trees of the Americana group. The varieties of Domestica or European plums are usually better held in the nursery until two years old. This applies to most of the Americana and such other varieties as do not make a strong branching growth during the first year.

Where the plum trees are allowed to remain the second year in the nursery, special care should be taken to form the heads at the proper height and with due balance of branches.

SOIL AND CLIMATE

Plums will thrive in almost all soils and climates, providing suitable varieties are chosen, providing they are propagated on proper stocks, and providing they have reasonable care. On light soils the Japanese and Wildgoose varieties prove most satisfactory. In alluvial river bottoms the varieties of the Americana, Wildgoose, Wayland, and Chicasaw groups are most at home. On gravelly hillsides on loams and clays the Domestica varieties are apt to succeed best. We have already indicated that peach stocks are best for light soils. The Myrobalan stock is probably best of those named for heavy soils, although such special stocks as St. Julien or the so-called horse plum may prove still better in critical cases. The peach stock does not succeed in a heavy soil nor in Northern climates.

PLANTING

Different kinds of plums have such diverse habits of growth that it is rather hard to give a single rule for planting and managing them. Some varieties in good soil grow to a spread of branches of forty feet. Other plum trees reach a maximum growth with a spread of ten feet, or even less. There are striking differences amongst the commercial varieties so that one must regulate his planting to some extent according to the kinds chosen. There is undoubtedly a strong tendency at the present time, especially marked amongst the best growers, to

plant trees closer than formerly. This is the same tendency which we find manifest amongst the planters of peach and apple trees. We have already remarked on Mr. Hale's plan of planting peach trees thirteen feet apart, and the opinion has been expressed that fifteen feet apart is ample room for most peach trees. In like manner we may say very confidently that fifteen feet apart each way is ample space for plum trees, though the writer is aware that this statement will be criticised by some. Under a proper system of management, twelve feet in each direction is quite sufficient, and many of the standard market varieties can be handled when planted ten feet apart. For most persons, however, and under careless systems of pruning, twelve to fifteen feet should be recommended.

CULTIVATION AND GENERAL CARE

The plum orchard requires the same kind of cultivation as the peach orchard and for the same reasons. It has been customary in former times to enclose the plum orchard with chicken wire and make it the scene of the chicken yard. Where a limited number of trees are grown this is fairly satisfactory. The theory is that the chickens collect many of the insects attacking the plums, and particularly the plum curculio. When the chickens are allowed to run amongst the plum trees, it is usual to omit any other cultivation. This is a fairly satisfactory method of handling plum trees in limited quantities for a home supply of fruit, but it cannot be undertaken on an extensive commercial scale.

One peculiarity which plums exhibit in a somewhat striking degree is that of self sterility of the

blossoms. It has been shown by extensive scientific experiment and any amount of practical experience that many, or even most, varieties of plums will not bear fruit when standing by themselves. The blossoms require pollen from flowers of some other varieties in order that they may be success-



A Well-Kept Plum Orchard.

fully fecundated. Unless this fecundation, pollination, or impregnation (whatever one chooses to call it) is successfully accomplished, the seed does not develop in the plum, and if the seed does not develop, the fruit also fails to develop. It is necessary therefore to see that the varieties are somewhat mixed in the orchard. Two or more differ-

ent varieties should be placed in adjacent rows, or at the most there should not be more than four or five rows of a single variety before one of another variety is planted. As there are considerable differences in the blossoming season of the different varieties, it is important to arrange this mixture of different kinds so that those which blossom at the same time may stand next to each other.

Plums require fully as much plant food as peach trees and for the most part of the same kinds. It is safe to use the formulas recommended for fertilizing peaches also upon the plum and to apply the same quantities.

PRUNING

At the time of planting, the plum trees may be headed back in the way recommended for peach trees. In other words, they are headed to a single straight stem and this stem is shortened in to a length of twelve to twenty-four inches. This method is almost inevitable in handling one-year-old trees. When the trees are transplanted at the age of two years, the heads should be properly formed in the nursery, as suggested under the subject of propagation. It is then necessary at pruning time only to cut back the side branches which have already been formed and to leave the whole tree in such a condition that it will make a well balanced top.

The head is formed on the young tree much in the same manner as that described for peaches. Considerable variations have to be made, it is true, with different kinds of plums, owing to their great diversity of growth. The Japanese varieties like Chabot and Satsuma and Red June may be managed on almost precisely the same lines as peach

trees. On the other hand the Americana varieties and the Damsons, which make thick bushy thorny heads, have to be allowed their own willful way to a much larger extent. With these thick tops the pruning consists largely in cutting out the crowding branches and keeping the head partially opened.

Summer pruning is particularly desirable with plums. Probably it would be best with most varieties to make the principal pruning of the year come in June or not later than the first week in July. Some pruning during the dormant season, which means usually in March, is also desirable. When the principal pruning is not given in June, there will be, of course, more need of attention at the customary March pruning.

Some excellent plum growers have a system of pruning which consists in the annual shearing of the top of the tree. All branches are cut off nearly level on top, as when a man's hair is cut pompadour, or as when a hedge is pruned. This is not a bad method especially with the *Domestica* varieties and the Damsons. It cannot be recommended for the varieties of the Japanese class.

DISEASES AND INSECTS

The plum tree is subject to the attack of various diseases, several of which assume economic importance at times. For the most part, however, only the black knot and the brown rot of the fruit cut any figure.

The black knot has long been considered the special bane of the plum grower. One sees not infrequently plum trees ruined by this disease and sometimes whole orchards are swept away. It is the almost universal experience of careful fruit-

growers, however, that a well managed plum orchard suffers very little from this disease. It has been repeatedly shown that the black knot can be controlled by proper management. In the first place the seriously diseased trees and the wild plums or cherries standing in the fence rows should be cut out altogether and burned. After that careful treatment with Bordeaux mixture, especially in the early spring before the buds start, will do something to check the disease. The most important means of control, however, lies in the timely use of the pruning shears. Every plum tree should be gone over during the last half of June, when the new knots first begin to show, and all knots should be removed and burned. If it is not thought too expensive, a second examination of the trees should be made about the middle of July, all knots being once more removed and burned. At the time of the customary pruning in March, when all the remaining knots can be easily seen, special care should be taken once more to remove and burn every vestige of a black knot. While this sounds in the telling like a considerable amount of work, it really is not so. It can all be done by any boy with sharp eyes. A good man can easily go over one hundred trees a day under ordinary circumstances.

The brown rot which attacks the plums just as they are about to ripen is the same as that which injures large quantities of peaches. The treatment is also the same. The trees should be kept in good condition, the fruit thinned, and Bordeaux mixture should be used. Early applications are especially advised.

Another disease which is sometimes of considerable importance to plum orchards, but which is distinctly less destructive than the two already men-

tioned, is the shot-hole fungus. This fungus kills small spots in the leaves, and these spots fall away leaving the foliage with the appearance of having been riddled by a charge of bird shot. At times this fungus is so effective in its operations that trees are nearly defoliated in mid-summer. At such times the results are serious. Careful spraying early in June with Bordeaux mixture, will reduce the amount of damage from this fungus also.

It should be particularly noted that in spraying plum trees with all ordinary fungicides and insecticides special care must be taken. The foliage of plums is particularly liable to injury and this is most emphatically true of the Japanese varieties. It is practically necessary to use Bordeaux mixture or Paris green at not more than one-half the strength employed on apples. Special care must be taken to see that an excess of lime is always present in the Bordeaux mixture, and the following formula will give such results: Four pounds of copper sulphate, six pounds of good lime, one hundred gallons of water.

Only one insect of importance attacks the plum and that is the curculio. It is usually regarded as a scourge and many persons consider it alone to make plum growing impossible. The scheme of planting plum trees in the chicken yards for the purpose of circumventing this insect has already been mentioned and may be safely recommended. Spraying with arsenical poisons will reduce the damage to some extent. The treatment usually recommended is to jar the plum trees in the early morning, shaking down the semi-dormant beetles upon a sheet or some other receptacle spread to catch them. Special machines or curculio catchers

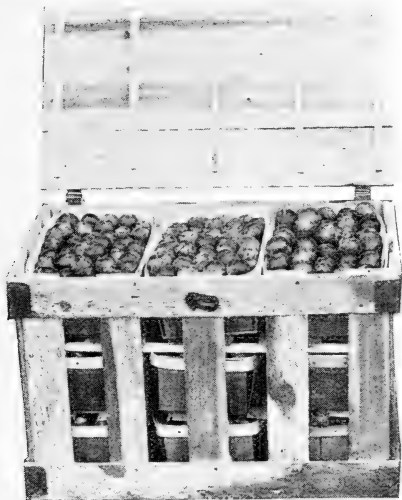
are made for this work and are to be highly recommended where a hundred or more trees are grown.

It has been the experience of the writer, however, that in nearly all cases the work of the curculio is a negligible factor in plum growing. This may sound like a rash statement, but it is supported by the experience of years. The fact is the work of the curculio is nearly all done early in the season before the time of the so-called June drop. During the month of June growers expect a considerable fall of young fruit from the plum trees. The writer has shown in extensive studies carried on some years ago, that this June drop is due to various causes, amongst which the lack of pollination and the work of the plum curculio stand pre-eminent. When this June drop is over a considerable proportion of the curculio punctured plums have fallen to the ground. Many of these which have remained are already marked for failure. After all this it is still necessary in a large majority of cases, to thin the remaining fruit by hand. During this operation of thinning there are removed practically all the punctured plums still hanging on the trees. The curculio is therefore to a certain extent a help in thinning the fruit from over-burdened plum trees. In fact it is the writer's experience that almost without exception the curculio is of more assistance than damage.

VARIETIES

The list of varieties of plums grown is comparatively longer than in any other section of fruits, except the apple. Certain varieties which are very valuable in one part of the country are of no use in other places. The selection of proper varieties therefore becomes a difficult matter. One should

always take great care in selecting plums to learn what varieties are successful in his neighborhood. A very good general idea can usually be formed by observing what group each variety belongs to. Thus the Japanese plums are the leaders for some



Crate of Plums.

localities, the Domesticas for others, while in Iowa and Dakota the Americanas alone can be relied on.

In the following list only a few of the leading sorts have been named, and these have been chosen with a view to covering all parts of the country.

In each case the group to which the variety belongs has been indicated in parenthesis immediately following the name.

Abundance (Jap.)—Tree upright, unhealthy and short lived, fruit medium to large, red, sweet, quality best of the Japanese, medium early.

American Eagle (Americana)—Tree vigorous and healthy, hardy, size medium, quality fair to good, medium early.

Apple (Jap.)—Tree spreading, vigorous, healthy, fairly productive, fruit large, red, fair to good, medium late. A promising new variety.

Arch Duke (Domestica)—Tree good, fruit blue, medium large, good quality, early.

Bavay (Reine Claude)—Much like Green Gage, but later and larger; sometimes called Late Green Gage. Tree moderately vigorous and prolific, fruit round, green, very best quality, specially fine for canning, late. Where this plum will succeed it is one of the best varieties known, but it is hardly ever a profitable market sort.

Blue Imperatrice (Domestica)—One of the best large blue plums. Tree good, fruit large and good, medium late.

Burbank (Jap.)—Tree sprawling, vigorous, healthy, early bearing and very productive, fruit large, round, slightly pointed, red, fine in appearance, good quality, especially for canning, midseason or later. This is by all odds the best of the Japanese plums.

Chabot (Jap.)—Tree vase-form, good, prolific; fruit medium size, round, somewhat pointed, light red, good medium late. One of the profitable Japanese varieties.

Chalco (Hybrid)—Tree vigorous, rather sprawling, fruit large, oblate, red, quality fair to good.

Cheney (Nigra)—Tree upright, extremely hardy, fruit small to medium, oval compressed, dark red, quality good when fully ripe. One of the best varieties for extremely cold localities.

Climax (Hybrid)—Tree rather upright, moderate bearer; fruit medium size, rather heart shaped, red, freestone, quality good, early.

Cluster (Damson)—Tree fairly vigorous, healthy and very prolific; fruit medium size, blue, good quality, medium late.

De Soto (Americana)—Tree hardy, rather small; fruit rather small, red, quality good. A favorite variety in Iowa and Minnesota.

Englebert (Domestica)—Tree vigorous, upright, prolific; fruit blue, medium size, quality fair to good. A good market sort.

Excelsior (Hybrid)—Tree willowy, slender; fruit medium size, heart shape, red, good, medium early. Has proved especially adapted to extreme southern latitudes.

Field (Domestica)—Tree rather small, fruit blue, or purplish, medium size, good quality, early.

Forest Garden (Americana)—Tree vigorous and hardy; fruit round, red, good, ripening mid-season.

Frogmore (Damson)—Tree smallish, healthy; fruit medium size, blue, good, late. A profitable sort.

German Prune (Domestica)—Fruit blue, freestone, small, long compressed, fair to good, late. A profitable market sort, but there are better.

Georgeson (Jap.)—Tree large, spreading, prolific; fruit large, yellow, good quality, fine for canning. One of the best canning plums, but undeservedly unpopular on account of its yellow color.

Golden Beauty (Wayland)—Tree healthy, spreading, prolific; fruit small to medium, yellow, good, late. Specially suited to Texas and the South.

Golden Drop (Domestica)—Coe's Golden Drop. Silver Prune. Tree large, rather straggling, late bearing; fruit large, egg-shaped, yellow, good, medium to late.

Gonzales (Hybrid)—Tree a good grower, but not very healthy, and not hardy in the northern states; fruit large, red, good to best, midseason. One of the most promising new hybrid plums.

Grand Duke (Domestica)—Tree good, early and prolific bearing for a domestica; fruit large, blue, good, medium late. Worth planting.

Green Gage (Domestica)—Tree small, slow growing; fruit small, green, extra good, medium ripening. An old favorite.

Gueii (Domestica)—Tree good; fruit blue, medium size, fair to good quality, midseason. A profitable market plum of its class.

Hale (Jap.)—Tree very strong grower, late bearing and not prolific; fruit medium to large, good.

Hawkeye (Americana)—Tree medium size, prolific; fruit medium size, red, slightly flattened, good, medium late. One of the best of the group.

Italian Prune (Domestica)—Fellenburg. Tree round-topped, rather small and slow growing, prolific after reaching a certain age; fruit blue, egg-shaped, large, good, late. A very profitable sort in some sections.

Jefferson (Domestica)—Tree straggling and unhealthy, not very prolific; fruit medium to large, yellow with red cheek; quality very best, early. Commonly regarded as the standard of quality.

Kelsey (Jap.)—Fruit large, heart-shaped, yellow, freestone. Tree is not hardy enough to succeed north of Louisiana, though it occasionally bears further north.

Lombard (Domestica)—Tree hardy and prolific; fruit medium size, purplish, quality fair to good, early. A popular plum because it stands neglect. There are many better varieties.

Miner (Miner)—Tree hardy and prolific; fruit small, red, good, medium late.

Pottawattomie (Chicasaw)—Tree healthy, fairly hardy; fruit medium size, brilliant red, good, medium late.

Red June (Jap.)—Tree vase-form, prolific; fruit medium size, dark red, quality fair, early. A profitable early market plum where the Japanese varieties succeed.

Satsuma (Jap.)—Tree spreading, vigorous; fruit large, red outside and in, good quality, fine for canning, late. A queer variety, bearing profusely in some neighborhoods, and almost sterile in others; a very profitable sort where it succeeds.

Wayland (Wayland)—Tree vigorous and healthy, prolific, fruit small, red, good, extra fine for preserving or jelly making, late.

Weaver (Americana)—Tree sound and good; fruit medium size, red, good, medium season.

Wickson (Hybrid)—Tree upright, vigorous, rather tender in bud, a somewhat uncertain bearer; fruit large, heart-shaped, red, partially free-stone, quality variable, medium late. Has sometimes proved a profitable market plum, but generally uncertain.

Wildgoose (Wildgoose)—Tree spreading, vigorous, prolific; fruit medium size, brilliant red, good, midseason. One of the best and most profitable varieties in many localities, especially in central states and middle latitudes.

Wolf (Americana)—Tree hardy and prolific, fruit small to medium, good, midseason.

Wyant (Americana)—Tree hardy and prolific; fruit medium size, red, good quality, midseason.

Yellow Egg (Domestica)—Tree upright, not over healthy, moderately productive; fruit large to very large; yellow, egg-shaped, good, especially for canning.



The Cherry

It appears to an enthusiastic horticulturist, of course, that all kinds of fruit-growing are more or less neglected. Personally I am prone to see opportunities in plum growing which no one else can appreciate. But in all seriousness it can be said that the cherry is more neglected in proportion to its merits than any other orchard fruit known in America. Sour cherries are really very easy to grow and thrive in nearly all soils and climates. They bear early and regularly. The fruit is very much enjoyed by everyone and always commands a high price in the market. Under these circumstances it is surprising how very few orchards there are on which any attempt is made at commercial cherry growing, and even more surprising to see how few farms there are on which enough cherries are grown for home use.

PROPAGATION

The propagation of the cherry is in a general way similar to that of the peach. Stocks are grown from seed and these are budded with the desired varieties. The details of the work, differ considerably.

The Mazzard cherry is usually recommended as a stock, but as a matter of fact the Mahaleb cherry is the one chiefly used in America. It is cheaper, grows more readily, works easier in the nursery and has many other practical advantages. It is true that these advantages are mostly in favor of the nurseryman rather than the orchardist, but there is not much to show that the fruit-grower would be better off if his cherry trees could be budded on

Mazzard stocks as the books say they ought to be. In the Northwestern states the seedlings of the common Morello species, or sour cherries, are used for budding or grafting. They are very hardy and make excellent trees. Where they can be grown and budded cheaply there is nothing against them. Some of the wild native cherries are occasionally used for stocks particularly the bird, pigeon or pin cherry (*Prunus pennsylvanica*). This is extremely hardy and fairly easy to work. It seems to be a satisfactory stock, especially in Northern climates.

For the most part the cherry stocks, particularly the Mahalebs, are imported from Europe. Sometimes the cherry seed is imported and the stocks grown in this country. Whether the stocks are to be grown from the imported or native seed, the pits are either planted as soon as they are ripe or they should be kept moist (not wet) and may be stratified early in the fall. This stratification is carried out as explained under the propagation of the peach. It is important that the seed should never be allowed to become stone dry.

The seeds are planted in the nursery row either in the fall or spring, the rows being three to three and one-half feet apart and the seedlings three to six inches apart in the row. Or the seeds are planted in a seed bed much more thickly, with the rows eight or nine inches apart and are cultivated here for the first year. At the end of the first year, either in fall or spring, these seedlings are transplanted from the seed bed to the nursery row, where they are budded the following August. In any case it is unusual to bud cherry stocks the first year. The pin cherry referred to above is an exception to this rule.

The buds are inserted in precisely the same manner as practiced with the peach and plum. The cherry is occasionally root grafted either by the whip-graft union or the side-graft union, and these methods are entirely successful. It is not often practiced, however.

SOIL AND CLIMATE

The cherry adapts itself readily to many kinds of soils, though it does not flourish well in extremely heavy nor in extremely light soils. Rich loose fertile gravelly loam is the best. The cherry does not succeed well in southern latitudes, being more at home in the north. Some varieties are hardy far to the northward, in this respect surpassing even the hardiest apples. The sweet cherry is particularly fastidious with regard to soil and climate. At any rate it is not successfully grown except in very limited areas in North America.

PLANTING

The actual work of planting a cherry tree is performed as in planting a peach tree. When a considerable number are to be set out, it is best to lighten the labor by using a plow as recommended in the chapter on peach growing. Trees may be transplanted either at one year old or two years old. If they are carried two years in the nursery, pains should be taken to head them low. The present fashion prevailing in nearly all the American nurseries is to head the trees too high. It is desirable that the head should be formed within twelve or eighteen inches of the ground, although it is much commoner to see them headed at three to five feet. This plan of low heading is especially import-

ant in the Western states. When one year old trees are bought from the nursery the planter has the privilege of heading them to suit himself. When the trees are received they should be prepared by pruning the roots and tops as described for peaches. That is, all loose broken roots should be cut away and all main root branches up to within three or four inches of the trunk. The top should then be cut back to a straight stick eighteen inches long, if the tree is a yearling, or if the tree is a two-year-old, the branches should all be cut back to three buds each and the leader shortened in as much as possible.

Fall planting succeeds admirably with cherries in moderate climates and in good soils. Spring planting is rather more common, but only because it has become the custom to deliver and handle nursery trees in the spring.

Sour cherries can be grown rather thickly on the ground. Small topped varieties like Morello can be successfully managed even as close as eight or ten feet apart. It is customary, however, to plant most sour cherries twelve to fifteen feet apart and this is the distance to be publicly recommended. Where sweet cherries are grown more distance is required. They should be planted sixteen to twenty feet apart each way.

CULTIVATION AND CARE

Cherries require practically the same cultivation and care and the same fertilization as plums. The cultivation should cease about midsummer, say July 1, or after the crop has been picked. At this time it is advantageous to sow a cover crop. The same sorts as are used for peaches, viz, cow peas, soy

beans, vetch, clover, crimson clover, etc., are to be recommended for cherries.

Cherries are sometimes said to become bark-bound. This is remedied by slitting the bark, beginning at the lower branches and carrying the knife down to the ground. Three or four such slits may be made in each trunk running down clear through the sap wood. It is a question whether this does any good or not, but it probably does not do any harm.

PRUNING

The cherry tree stands about midway between the plum and the peach in its habit of growth as well as in its habit of fruit bearing. The pruning of the tree therefore takes a similar middle course. Care should be taken with young trees the first two or three years of growth to secure strong symmetrical well balanced heads. This is done by careful annual pruning, or better still, by two or three prunings each year. After the heads have been formed and the trees have been brought safely into bearing comparatively little pruning is required—perhaps less on cherries than on any other fruit trees. It is necessary only to remove the broken, binding or interfering branches, and occasionally to open up the head slightly by taking out limbs where they are crowding. Sour cherries particularly submit well to a more severe method of repressive pruning, such as is sometimes practiced on plums and peaches. In these prunings the annual growth is severely headed in each year. From one-third to three-quarters of the last annual shoots are thus removed at a spring pruning and this process is repeated annually. Indeed it is very important that

the pruning should be regular and uniform, if these methods are to be adopted at all. They are very successful when judiciously and thoroughly carried out. They produce mortifying results, however, when wrongly managed.

PICKING AND MARKETING

Cherries should always be picked with the stems on. There is no exception to this rule. The stems are valuable. They help to carry the fruit to market. Moreover when the stems are plucked out, the juice always exudes from the wound and the fruit quickly becomes moist and sticky. In commercial orchards the picking is usually done by women and girls and paid for it at the rate of two cents a quart.

Cherries are quite commonly sold in quart baskets of the same kind as are used for strawberries. These baskets are crated and shipped in the same way. Where cherries are abundant they can be sold in larger packages, and ought to be. The Climax baskets of the five, eight and ten pound sizes are perhaps the most practical packages for handling cherries in the market. Cherries are usually sold by the quart, but sometimes by the pound. This is a sad commentary on the quantities offered in most markets. Cherries ought to be sufficiently abundant so that everybody could buy them by the peck or bushel.

DISEASES AND INSECTS

The sweet cherry is especially subject to all diseases and insects within reach. It is hardly worth while to give here a list of the diseases and insects which are to be expected on sweet cherries. The

sour cherry is remarkably free from serious insect depredations and fungus attacks. The leaf spot sometimes defoliates the tree early in the year, but not often enough to injure the tree seriously. Spraying with Bordeaux mixture will largely prevent the damage. The black knot occasionally appears on neglected cherry trees, but the methods described for the repression of the black knot of the plums will more easily prevail against the black knot of the cherry. The black knot of the cherry, by the way, is caused by exactly the same fungus as that which causes the black knot of the plum. The disease may be readily communicated from the cherry trees to the plums, or vice versa.

The curculio sometime attacks sour cherries, but not often to such an extent as to cause measurable injury. The aphid or plant louse is apt to be the worst insect enemy of the sour cherry. When this appears early in the season, as it is apt to do in dry weather, it may cause very serious damage. If it comes late in the year, that is after July 15, the damage is considerably less, and after August 1 it might as well be disregarded. There is hardly any way of combating this aphid after it has once gained lodgment on the young leaves. Soon after it begins work the leaves are curled backward, thus effectively protecting the lice. If they are discovered, however, before they have secured perfect lodgment, they may be successfully treated with kerosene emulsion.

To make kerosene emulsion, dissolve one-half a pound of soap shaved fine in one gallon of boiling water. Remove this from the fire and pour it while still hot into two gallons of kerosene. Churn this thoroughly with a spray pump until it changes first to a creamy mass, then to a soft buttery-like mass.

This can be kept for a considerable time. When it is desired for use, it should be diluted by taking nine parts of water to one of the stock. After these preparations have been put into the spray pump, it is well to have them thoroughly agitated by pumping back into the tank for several minutes. Kerosene emulsion is a nasty thing to make and unpleasant thing to use, and when wrongly prepared or improperly applied, is apt to damage the plants. It should therefore be undertaken with due forethought and the work done with great care.

VARIETIES

There are comparatively few varieties of cherries generally grown in this country. Leaving aside the sweet cherries, which as has been said, cut only a small figure in American pomology, the number of varieties extensively planted are only about three. These are Richmond, Montmorency and Morello. While there are several other good varieties of sour cherries such as Dyehouse, Mayduke, Ostheim, etc., the three first named represent a very large majority of the trees used. They furnish a good succession of fruit in the order named above, Richmond being early, Montmorency midseason, and Morello a late variety. The following list of varieties includes only those most commonly sold by American nurserymen today.

Belle de Choisy (Sour)—Medium size, roundish, reddish, short-stemmed, flesh pale, flavor mild and good, early, moderately prolific.

Belle d'Orleans (Sweet)—Medium to large, heart-shape, yellow and red, early to mid-season, and a good early market variety.

Belle Magnifique (Sour)—Large, roundish, rich

red, stem long, flavor good, late, productive; tree good.

Blackhawk (Sweet)—Fruit large, heart-shaped, purplish black, flesh purple, rich and good. Ripens in June.

Black Heart (Sweet)—Medium size, heart-shape, black, flavor good, mid-season, not very hardy, but an old-time favorite.

Black Tartarian (Sweet)—Large, heart-shape, black, flesh dark, rich and sweet, early, good grower and productive, one of the leading favorites.

Coe's Transparent (Sweet)—Medium size, pale and red, sweet and good quality, early ripening, another old-time favorite, especially for home use.

Downer (Sweet)—Size medium, red, tender, rich and highly flavored, medium late, a good sort.

Dyehouse (Sour)—Medium size, roundish oblate, red, fairly good quality, very early. A profitable sort.

Elton (Sweet)—Large, heart-shape, pale yellow to red, flesh firm, rich, highly flavored; prolific, but not a good market variety.

Gov. Wood (Sweet)—Large, roundish, yellow and red, nearly sweet, rich and good, early to medium, prolific and profitable where any cherries of this class can be grown.

Louis Philippe (Sour)—Medium size, round, dark red with red flesh. Ripens in July. Good.

May Duke (Sour)—Large, round, red but becoming nearly black, flesh reddish, but becoming darker, early. Formerly very popular, but less so in recent years.

Montmorency (Sour)—Tree large, upright; fruit large red, round, sour, medium season. An old French variety very widely grown in this country. Very variable, or at least there are many different

forms sold by nurserymen, some better than others. One of the best market varieties.

Morello (Sour)—Medium to large, dark red, almost black, flesh dark, late to very late. Tree dwarfish and bearing early. One of the very best market and home use varieties. The early Morello is a sub-variety of this. Like all the old varieties, this varies greatly, some strains being better than others.

Napoleon (Sweet)—Large to very large, heart-shape, yellow marked with red, flesh very firm, good quality, rather late, tree good, productive, very largely grown for market and for canning.

Olivet (Sour)—Large, roundish, red, early and fairly good; formerly much grown for market.

Ostheim (Sour)—Large to very large, dark red, flesh dark, very good, tree hardy, mid-season. A first rate variety of Russian origin.

Reine Hortense (Sour)—Large, roundish, bright red, sub-acid; late, moderately productive; a good variety.

Richmond, or Early Richmond (Sour)—Small to medium size, round, bright red, stem rather short and stout, juicy, productive, early, a fine market variety. Tree a strong, clean grower and an early bearer.

Windsor (Sweet)—Large, roundish, yellow and red, juicy and good, late and one of the best of its class.

Yellow Spanish (Sweet)—Large, heart-shape, yellow with a red blush, firm and good flavor. One of the best. Mid-season.

The Nectarine

This is a fruit worthy of much more general culture in America. In fact it is almost unknown. The named varieties of nectarines are propagated exactly like peaches. They are budded on peach stocks, or they may be dwarfed by budding on plum stocks. As the nectarine is a garden fruit rather than an orchard tree, the dwarf form is comparatively more desirable than in the case of the peach. The methods of planting, pruning, and management are exactly the same as for the peach, as are also the treatment of diseases and insects.

There are only a few varieties known, of which the following are most commonly propagated in America.

Boston—Medium to large, round oval, yellow with red blush, flesh yellow, freestone, quality medium to good, mid-season.

Downton—Medium to large, round oval, color greenish, with a red blush in the sun, rather attractive, flesh greenish, half free, quality fair to good; very early.

Early Newington—Medium to large, round oval, green, flesh greenish white, marked with red; clingstone; quality good to best; early.

Early Violet—Medium to large, round, yellow marked with red, handsome, freestone; very early.

Stanwick—Small to medium, round oval, greenish, flesh white, quality only fair; late.

The Apricot

This fruit is a curiosity outside of California. For the sake of variety it may be grown in almost any garden, at least within the section where the peach succeeds. The tree and fruit are almost midway between the plum and the peach in character, are subject to the same diseases, and are cultivated and managed in the same way. The apricot is best propagated on apricot stocks, which are grown from seed as peach stocks are grown. It may also be propagated by budding on peach or plum stocks. The fruit is rather better when cooked and canned than when eaten fresh from the tree. When eaten fresh it should be perfectly ripe. Many persons get an unnecessarily poor opinion of the apricot from eating the fruit in a half-ripe state.

The following varieties are best known in America:

Alexander—Orange yellow, early; freestone. Russian.

Budd—Small, yellow with red cheek, fairly good, medium early, but hardy. Russian.

Gibb—Another Russian, roundish, light yellow, fairly good; early; freestone.

Moorpark—One of the oldest and most popular varieties; large, nearly round, orange or orange red, freestone, firm flesh, juicy, mid-season. Not so hardy as the Russians, but a better fruit.

Ringgold—Large, round, orange, good quality. Midseason.

Royal—Medium large, roundish oval, yellow with flush, firm, juicy and sweet, freestone. One of the leading market varieties in California.

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