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FRUITS

FOR THE HOME GROUNDS

PREPARED BY U. P. HEDRICK
for the American Association of Nurserymen

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FRUITS FOR THE HOME GROUNDS

PREPARED BY

U. P. HEDRICK

Horticulturist, New York Agricultural Experiment Station

FOR THE AMERICAN ASSOCIATION OF NURSEYMEN

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FEW words are needed to tell of the value of fruit as a food, or to commend the delights of that food when freshly plucked from nearby trees or plants. The tremendous increase in the use of fruits in America—we are the fruit-eaters of the world!—makes evident their importance.

However, there is a mistaken impression that it is impossible to raise these delicious fruits on the small home grounds. It is to make plain the truth that even a little back yard may provide room for the trees and plants that will bring fruit-blessings to the home that this pamphlet has been written for the American Association of Nurserymen.

Making America More Fruitful and More Beautiful. A number of the leading nurserymen of the country, realizing that success with fruit trees, shrubs, and flowers depends wholly upon adequate knowledge as to their care on the part of the planter, have cooperated in a campaign to make success for everyone who plants as certain as it is humanly possible to make it. Therefore the Nurserymen's National Service Bureau is glad to endorse the Fruit Book.

97815

Such a fruit-garden supplies for the family's wants, and oftentimes a little surplus for the less fortunate neighbor or friend

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FRUITS FOR THE HOME GROUNDS

CHAPTER I

THE JUSTIFICATION OF THE FRUIT-GARDEN

He who plants fruits is a friend of man. Whether he plants for profit in an orchard or for pleasure in a garden, he belongs to the world's producers. Small producers as well as large producers may take just pride in the fruit industry of our great country, for actually the farmer and the small landholder grow most of America's enormous crop of fruits. According to the Thirteenth Census, the value of all fruits produced in the United States in 1909 was \$218,000,000, or one-third the value of the wheat crop; and more than one-half of this grand total, the census statistics show, comes from the fruit-gardens of country and city. We learn that 2,980,000 persons reported bearing trees of the apple alone in 1910. Of other tree fruits and of small fruits the number is, of course, much greater.

**Money-value of
Fruits from
America's
Fruit-gardens**

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We learn that 2,980,000 persons reported bearing trees of the apple alone in 1910. Of other tree fruits and of small fruits the number is, of course, much greater.

But the money-value of the produce of fruit-gardens cannot be fully shown in census figures. The supply of food thus produced for the millions of homes is enormous. In all the world, America has the greatest plenty. The plots of fruit planted on the farms and in the gardens of this country constitute a vast food-resource.

**Fruits a
Necessity of
Healthful
Living**

Is it wise to plant fruits which do not have as high food-value as cereals, starchy vegetables, and meats?

Yes, even when the richer foods are in scanty supply, fruit plantations must be maintained, and new

orchards, vineyards, and small-fruit plots must be set with due regard for the future, for fruits are a necessity as well as a luxury. The medical authorities of the country so call them. They tell us that fruits should form a part of the food regimen of every person. The working efficiency of the whole nation would suffer should there be a falling off in the supply of fruit.

In view of this necessity for fruit, no landholder is doing his duty by his land who does not grow fruit for his family's wants, and he is doing well by his country when he grows a surplus to sell to less fortunate neighbors.

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Not infrequently every other ornamental feature of the homestead is subordinate to the orchard. Indeed, the orchard is often the only refuge of the farmer for beauty. The tree that produces the most fruit, or even the best fruit, is not always the most-prized tree, for men love the sight of fine orchard trees.

Fruit trees should be planted for their beauty. Whether in foliage, flower, or fruit, an apple, pear, cherry, plum, or peach tree is about the most direct and energetic effort of Nature to secure physical loveliness. Fruit trees, in their diversity, offer a wonderful field from which to select combinations of form and color.

Sir Isaac
Newton a
Wise Man

An apple tree is the tree of all trees under which to spend a restful hour. Sir Isaac Newton was a wise man, and he chose an apple tree to sit beneath. Under the apple tree one may lie, or sit, or swing, and watch the sky through glimmering leaves and golden, red, or russet fruit, while the sweet savor of ripening fruits drifts in the air, and the drowsy hum of wasps and bees soothes mind and soul. Where better obtain a whiff of happy boyhood than in an orchard?

An apple tree is both beautiful and fruitful and may well have a prominent place

No work is more healthful than that with trees, vines, and bushes; none is fuller of variety and interest. Every day in the fruit-garden brings a new surprise and a new delight.

A Fruit-garden is a Moral Agent The fruit-garden is more than a place to make money, means more than home comfort and good cheer, is more than an ornament of the homestead, more than a pleasant avocation. The fruit-garden, besides all of these, is a moral agent. Let a man tell you what governed him in laying out and growing his orchard, and he will give

THE JUSTIFICATION OF THE FRUIT-GARDEN

you his autobiography, for he interweaves his tastes, preferences, and character in an orchard that he plants and tends.

Educational Value of a Fruit-garden The life-events of a plant form a most interesting series of chapters. First, the buds begin to swell; leaves appear; then the blossoms come; fruit-formation follows; the fruits pass from greenness to maturity and decay; leaves drop; wood passes into winter maturity; the cycle ends, only to begin again. Fruit trees have a place and a function in education. A school orchard is the place for pupils and community to learn about fruit products, whenever ground is available. Fruit trees can be planted about the schoolhouse, or a small plot can be set aside for the school orchard.

The trees must be cared for by the pupils. The children would here have a chance to become acquainted with injurious insects and pests. They could be taught how to fight them. Here, too, the principles of pruning could be taught. Teaching children to care for school trees would result in better care of trees in home orchards. The association with trees begun in childhood will go on throughout life. The school orchard is a coming factor in agricultural education.

The fruit-garden, then, is justified by what it produces in money value; because fruits are a necessity of healthful living; for its ornamental value; a moral agent; and for its educational value.

A few such trees in the home garden save many a dollar .

CHAPTER II

FRUIT-GARDEN FORETHOUGHT

A fruit-garden is a permanent improvement. Its span of life is as long or longer than that of the person who plants it. An addition so enduring must be planned. Unless there be forethought, maturing in a plan, all future efforts may fail. Besides, there is much pleasure in anticipating and planning; it makes the garden one's very own, lifting it from the commonplace of "ready-made" articles by which one is often surrounded.

There is Wisdom in a Plan About the first thing to decide is the size. Let it be as large as circumstances will permit, remembering that a small plantation properly planned, well planted, and kept at all times with a fine finish, is better than a larger plantation poorly laid out and badly cared for, and the returns will prove the wisdom of this decision.

The Size In home plantations one must plant the ground he has. A man who grows fruits for the market must select his location with the greatest care, since he must grow fruit at the lowest cost to meet competition; but for the home garden the planter must select particular fruits for the ground

Flowers and fruit combine to make this a self-supporting garden

The popular Winesap Apple

he is to use. Some kind of fruit can be grown with pleasure and profit about every home where anything will grow.

The home garden is largely at the mercy of circumstances, too, in the matter of soil. But here, happily, Mother Nature can be improved upon. If the earth's crust is not all arable soil in a particular location, soil can be brought, or stone and other impediments can be removed; if it is poor, it can be enriched.

The ideal site for fruits is one above the surrounding country, so that both soil and atmospheric drainage are good. The land need not be rolling if there are lower lands adjacent. The exposure exerts considerable influence on tender fruits. Near a body of water, choose the exposure toward the water. Between the sides of a lake or river, choose the side exposed to the prevailing wind. Away from water, choose a northern exposure for tender fruits.

Choosing Varieties

Experience is a better guide as to what to plant than volumes of instruction. It is to be presumed that every man knows what he would like best to grow; experience alone will teach him whether he can grow it. Lacking experience, a man should get on good terms with his neighbors

Every home grounds should have a Peach tree

and find out what succeeds best with them. Before finally choosing varieties, think twice or thrice, for there is nothing more disturbing in a fruit plantation than varieties one does not want.

But these generalities do not solve the perennial problem of what to buy. While agents and catalogues may carefully describe varieties, often the merits of novelties and standards are sung in the same key, so that the buyer cannot distinguish between tried and untried sorts. Here are a few simple guiding rules.

First, decide whether the fruit is to be grown to eat out of hand or for culinary purposes, or both.

Second, divide varieties to be planted into early, midseason, and late; or summer, autumn, and winter.

Third, select northern sorts for the North and southern sorts for the South, as all varieties have limits in latitude, and none will thrive out of its proper latitude.

Fourth, as each variety of any fruit has a more or less marked preference for a particular soil, so sorts ought to be chosen for soils, so far as information makes possible.

FRUIT-GARDEN FORETHOUGHT

Fifth, choose varieties that are known to be self-fertile, or, in choosing self-sterile sorts, make sure that opportunity for inter-pollination is provided for. The nurseryman must help in this choice, having the knowledge, and he will gladly use it for the planter.

Sixth, for trying locations, such as niggardly soils or churlish climates, select the more vigorous varieties that the plant's internal push may offset as far as possible unfavorable environment.

Seventh, choose special-purpose rather than general-purpose varieties.

Eighth, try a few novelties. Novelty, in horticulture, is the great parent of pleasure.

Ninth, if spraying is impossible, select varieties immune to the most destructive pests. Thus, the Baldwin and Winesap are free from apple-blight; apple-scab seldom attacks Ben Davis; pear-blight does little damage to Kieffer and Seckel; Early Crawford is nearly free from peach-leaf curl; San José scale never attacks the Montmorency cherry and seldom the Bradshaw plum. Lists of varieties immune to the various pests can be had from state experiment stations, and most nurserymen also are well informed.

Buying Dependable Trees

When the bud is in the bough and the leaf is in the bud it is difficult to tell a good tree from a poor one.

Tree-buying is a case of "trust me not at all or all in all." The greatest assurance for dependable trees, then, is the dependable nurseryman. Still, trees have certain earmarks that commend them or condemn them to good gardeners.

Thus, a short, stocky plant is usually better than a tall, spindling one. A tree with many branches is better than one with a few branches. Plants with much-branched roots are better than those with a scanty root-system. A tree with smooth, bright bark is better than one with rough, dull bark. Neither

Good trees as they come from the nursery

FRUITS FOR THE HOME GROUNDS

does one want a dingy, bruised, unhappy waif of a tree—these are the plants that make the scapegoats of the orchard. Be it remembered, however, that there is great variation in *varieties* of any fruit in all of these characters. Some good trees are never “slick.” Who ever saw a straight, handsome young tree of Rhode Island Greening apple?

The age and the size of the trees are matters of prime importance. Here the nurseryman’s advice, if one is inexperienced, should be taken. Long dealings have taught nurserymen what age and size of trees succeed best in the varied soil and climatic conditions of the location to which they cater, and, since sales depend on satisfaction, a reputable nurseryman’s information is usually reliable.

It is well for the buyer to ask for trees of average size and those typical of the variety, remembering that mere size, big or little, is not a good measure by which the value of a tree may be gauged. Two-year-old plants of the tree fruits, the peach and the plum in the South excepted, are usually better than one-year-olds. One-year-old peach, bush, and vine plants are the accepted rule, though two-year-old bush and vine fruits are sometimes better. Plants older than two years, as a rule, must be handled by specialists; unskilled growers planting old trees usually perform a burial rite or, at the very least, sign a death warrant. Specialists to grow and specialists to replant, however, often achieve signal success in handling trees of even fruiting age.

True-to-name variety and good-name nurseryman go together.

Abundance Plums

A good reputation is a nurseryman’s best asset; it cannot be bought and is acquired only by years of honest endeavor to grow and sell good trees. Bearing these facts in mind, the fruit-grower can see that his best safeguard in securing the best trees true to name is in dealing with dependable and well-known nurserymen.

Every cultivated plant is infested by insects and infected by diseases. The strong arm of the law, federal and state, controls the distribution of nursery stock attacked by insect or fungus parasites so that the buyer may expect his trees to come to him from any part of the country free from pests.

A generation ago it was good advice to tell buyers that trees grown near home were to be preferred. Now, with quick transportation, much better storage facilities, and improved methods of handling, trees may be shipped long distances with little or no detriment to their welfare. Mere distance, therefore, is not important.

Care of Young Plants

The following simple rules for handling fruit trees as they come from the nurseryman are themselves the fruit of long experience and ought to be observed. The trees must be unpacked without delay. If possible they should be planted at once; otherwise they must be "heeled-in." Heeling-in is temporary planting, and consists of a short transplantation, the shorter the better, in a trench wide enough and deep enough to receive the roots of the thickly set plants. If a long delay threatens, slope the trench to the south and cover not only the roots but about half of the bodies of the trees. Commonsense makes plain the necessity of keeping the roots completely covered from sun and wind.

Sometimes plants come almost hopelessly dried out. One can often successfully play providence to these dead trees and bring them to life by burying, root and branch, in damp earth for a week or ten days; and their eventual prosperity may be the better assured by pruning more severely than is suggested in Chapter VII.

"Heeling-in" fruit trees on their arrival

CHAPTER III

ORCHARD AND PLANTING PLANS

We are not yet ready to plant the orchard. A wood is a maze; an orchard is a plan. There must be a plan if the owner is to get the most out of his land. Now getting the most *out of* the land may mean getting the most *on* the land. In other words, the planter must plan to make use of every foot of land throughout the life of the plantation. The home planter must make use of the spaces between the plants he wishes to be permanent. How? There are two ways: He may use fillers; or, he may plant a two-storied garden.

Getting the Most Out of the Land

Fillers

A filler is a temporary plant set among permanent plants. A good filler is an early bearing variety of the same fruit or of a shorter-lived species. Wealthy or Wagener are admirable filler varieties to set among other apples because they are both early in bearing and short-lived. Or peaches, cherries, quinces, or brambles or bush fruits may be set in the apple orchard. Again, bush-fruits or brambles may be set in the peach or cherry orchard. Many set dwarf apples or pears between standard apples and pears. These dwarfs come into bearing earlier than standard trees, may be set much closer, thus giving an opportunity for more varieties, and the product is often rather better.

"Fillers" or a "two-storied" garden

Here is the rub with fillers—sooner or later they must come out. One learns to love a goodly tree, especially of one's own planting, and to lift the axe against it, our affections meanwhile clinging to it, is a species of murder that few can practice. When permanents and

ORCHARD AND PLANTING PLANS

fillers interlock their boughs, the axe of the woodman must lay the fillers low.

A "Two-storied" Garden A "two-storied" garden? Yes, fruits above and vegetables beneath. The plan is perfectly feasible when space is scanty. There are no objections whatever to this two-storied garden if the upper story alone is continued when the trees come into generous bearing. After the trees begin heavy cropping, the land cannot do duty by both fruit and vegetables. The fruit trees, it must be remembered, are the aristocrats of the garden and can appear at their best only after all other cultivated plants are excluded.

Fruits on Very Small Places There is a feeling that fruits should be planted only when there is room for an orchard—an acre or a half-acre at the very least in the clear. Not so, for one may successfully plant a modest but very satisfactory plantation on a quarter-acre, or even less. Fruit trees sometimes make satisfactory lawn ornamentals, and borders of grounds may well be planted with bush-fruits and the arbor or pergola be covered with grape-vines. Perhaps there may be room for but one tree by the pump, or the woodshed, against the barn or garage, or in a corner of the garden. Plant that one tree, if only as a symbol of home and good cheer. Plant it for its beauty as well as its fruit.

Planting Plans An orchard plan is almost wholly dependent on the particular location, hence can be made only by a man on the spot. But whatever the location, one of three arrangements of trees is likely to be chosen to locate the position of the trees in the plan. If more than a very few trees are set, the arrangement is almost always in the formal figure of a *square* (or a slight variant, the rectangle), a *quincunx*, or a *hexagon*.

The Square The simplest and commonest plan for an orchard is a series of squares, with a tree at each corner of adjoining squares.

FIG. 1. Diagram of square planting. The circle shows the spread of the trees and the shaded portion the area supposed to be wasted.

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But in theory, at least, this arrangement of trees is the most wasteful of land of the several arrangements. Figure 1 is a diagram of trees planted at the corners of squares, and shows, on paper,

FIG. 2. Hexagonal planting. The trees are equidistant in all directions, forming a series of equilateral triangles or a hexagon with a tree in the center.

what the theorists call the waste land of the arrangement by squares. But a vigorous tree searching for sun and food and moisture is no respecter of theory and sends its branches and roots quickly into the waste areas of sunlight and soil! Certainly trees are most conveniently cared for when planted in squares.

The quincunx is an arrangement whereby five trees are used in a figure—four at each corner and one in the center of a square. So planted,

nearly twice as many trees as can be set in squares are put out, but there is just as much waste, for, as may be seen by analyzing Figure 4, a number of connected quincunxes form a series of squares running diagonally across the orchard. As we shall see, the quincunx is usually used only when the center tree is to be cut out when it begins to interfere with the growth of the corner trees.

The Hexagon The plan of setting in a six-sided figure, the hexagon, looks best on paper. In this arrangement, as shown in Figure 2, all of the trees are the same distance apart in any direction—distributed evenly over the ground. By setting the trees the same distance apart, 15 per cent more trees are used in this arrangement than when put at the corners of squares.

Planting Fillers in the Several Figures Fillers are used in the square arrangement by planting the early-bearing sort halfway between the permanents in each direction. Thus, Greening or Baldwin might be set 40 feet apart each way, with

Wealthy or Wagener 40 feet apart in one row and 20 feet apart in the next, giving three times as many fillers as permanents. Figure 3 shows this arrangement. Peaches, of course, might be used as fillers. In thinning, the alternate diagonal row is usually cut out

ORCHARD AND PLANTING PLANS

first, leaving a filler tree in the center of the square, which can stand some years longer.

The quincunx arrangement offers a very good method of using apple and peach fillers in a permanent apple orchard. Apple fillers are set halfway between permanent apples, forming the corners of squares running diagonally across the orchard. Peaches are set halfway between the permanent trees on the diagonal rows. When the trees begin to crowd, the peaches are removed and, a few years later, the apple fillers. Figure 4 shows this arrangement.

For those who want to get the very most out of a bit of land, the arrangement of apples and peaches in Figure 5 is recommended. The permanent apples are set 50 feet apart. Apple fillers are set halfway between the permanents. Peach trees are set halfway between the apple trees in the perpendicular rows, with rows of peaches between the combination rows.

Advantages of the Three Arrangements Compared

A study of the illustrations and text shows that, while the square system is most wasteful of space, it best permits orchard operations and is, possibly, best adapted to the use of fillers. Thus, planted in squares, fillers may be thinned, first to the quincunx figure and later to squares of permanent trees, giving a gradual transition from a closely planted orchard to one with trees far apart.

The quincunx arrangement, be it at all times remembered, is but a series of squares thrown diagonally across the field, and offers a good method of using a few fillers in an orchard.

The hexagon carries the palm of merit in saving space and hence is most desirable for intensive culture in home gardens.

The choice of arrangement must depend on the several conditions of the grower. Cheap land and abundant land indicate an arrangement in squares; expensive land, small holdings, and

FIG. 3. Fillers used in the square arrangement by planting early-bearing sorts halfway between permanents in both directions.

○ Permanents ● Fillers

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FIG. 4. The Quincunx-filler arrangement. The orchard is planted with permanent apple trees, apple fillers, and peach fillers.

- Permanent trees
- Peach fillers
- Standard apple fillers

intensive culture indicate hexagonal plantings.

Distance Apart and the Struggle for Existence

Have you seen trees struggling for existence in a forest? There trees perish by

too great abundance, those stronger than their neighbors, or more fortunate in position, surviving by starving out those about them. There is a struggle for existence in a thickly planted orchard, for even if all plants survive, the individual is squeezed out of symmetry and robbed of normal development.

To prevent this is the argument for generous distance between

plants at first setting, or for using the axe when the process of mutual suffocation begins in an orchard. Every fruit-grower knows that the trees on the outside of his orchard produce most and best fruit because they get the most air, sunshine, wind, moisture, and food.

Planting distances vary much with many conditions, as fruit, variety, soil, climate, method of pruning, and so on. The following table shows average planting distances for the commonest fruits:

	Distances Apart for Planting Fruits
Apples	30 to 50 feet each way.
Apples, Dwarf, on Paradise stocks	10 to 16 feet each way.
Apples, Dwarf, on Doucin stocks	12 to 25 feet each way.
Pears	20 to 30 feet each way.
Pears, Dwarf	10 to 15 feet each way.
Plums	16 to 20 feet each way.
Peaches	16 to 20 feet each way.
Cherries	16 to 25 feet each way.
Apricots	16 to 20 feet each way.
Nectarines	16 to 20 feet each way.
Quinces	8 to 14 feet each way.
Grapes	8 to 12 feet each way.
Currants	4 by 5 feet.
Gooseberries	4 by 5 feet.
Raspberries, Black	3 by 6 feet.
Raspberries, Red	3 by 5 feet.
Blackberries	4 by 7 to 6 by 8 feet.

An orderly man will have no botchwork in aligning and spacing his trees. A crooked row is a sign of a sloven.

Laying Out the Orchard

To keep rows perfectly in line requires but a good eye, a little mechanical skill, and a sufficient amount of patience; lacking these a man should employ a surveyor.

The measuring-wire is the best method of keeping rows straight in a small plantation. It may vary in length from 200 to 300 feet. The best wire is made of annealed steel, about an eighth of an inch in diameter. This wire is marked throughout its length by patches of solder, indicating the distances between plants.

In planting in hexagons, lay off the base-lines as for squares, and then use an equilateral triangle of wire, the dimensions equal to the distances between trees, being guided for the first rows by a line of stakes. An iron ring at each angle of the triangle, to drop over stakes, is helpful in this device. It is easy to locate a tree in the center of a square, for planting in the quincunx arrangement.

FIG. 5. Hexagonal-filler arrangement. Intensive use of fillers—320 trees, 80 apples and 240 peach or other stone-fruits.

Permanent trees
 Peach fillers
 Apple fillers
 Extra peach fillers

CHAPTER IV

CARETAKING

Fruit-growing is a ceaseless task; orchards begin to "go bad" as soon as their owners settle down to self-satisfied complacency. Season in and season out, trees must feel the gardener's caretaking touch; they seem able to recognize it. This caretaking begins at the very start in the preparation of the land.

Preparing the Land

Soil is immortal. The earth changes, but soil endures to serve generation after generation. Soil, therefore, should have all the care its owner can lavish on it. Care consists in plowing, harrowing, cultivating, spading, hoeing, raking, and smoothing. Preparing land for fruits may require all of these operations—the more the better if the land is to yield its best. Underdrainage must be provided if the soil is wet.

A good orchard soil is well supplied with what we call organic matter, meaning that which is in a condition to be absorbed—as manure, rotting leaves or vegetable refuse and the like. A soil without organic matter is but a skeleton,—dead, inert, and lifeless,—and trees will not grow in the framework of a soil. Green crops or manures must be turned under to put flesh on the soil-skeleton.

The orchard is to stand a generation or two. It might well, then, be put in training for the long service it is to render. The crops for a few years preceding planting ought to be such as will enrich it and leave it in the best of tilth. Vegetables are the best preparatory crops.

To Everything There is a Season

"A time to plant and a time to pluck up that which is planted," is good Biblical advice on planting. For parts of the cold North the best time to plant trees is early spring, when sun and showers arouse the spirit of growth. At this time nutritive solutions proceed quickly and unerringly to their pre-appointed places, and the trees begin at once the double task of making fresh roots and opening dormant leaves. Fall planting puts forward the work when all is favorable, but wet falls and cold winters sometimes cause serious losses, in northern climates at least. Yet in the "Sunny South," the easy fall, preceding a milder winter, affords excellent opportunity for successful planting. It is "a safe bet," to consult a reliable nurseryman in any neighborhood; it is his business to be right. Spring or fall, the soil should be reasonably dry, warm, and mellow when the work is done. Late-set

CARE TAKING

plants need special care lest they suffer from the summer droughts which annually parch the land.

Planting

If the land is properly prepared and the trees are in good condition, planting is easily, quickly, and safely accomplished. There is no need of such puttering over-niceties as laying out the roots to preserve the fibers, and inserting the plant in a gingerly fashion to make sure that it stands in its new abode as it stood in the old. On the other hand, to slap the plants in hit-or-miss, burying some roots and leaving others exposed, is courting failure.

The Hole as Large as the Orchard

The holes should be large enough and deep enough to hold the roots without undue crowding. It is unimportant to make them larger, for, if the land has been

well prepared, the hole is really as large as the orchard. Deep holes are often a menace to plants, becoming a tub into which water pours and stands about the roots.

The practice of digging holes in a leisure time, that all may be ready when the plants arrive, is a bad one. Dormant plants strike root best in freshly turned, moist, and newly dug earth, which can be then well firmed about the roots when the tree is planted. It is good practice, however, to throw the surface soil to one side, and the subsoil to another, so that the moist and most active top soil may be put nearest to the roots.

Don't be afraid of making the hole too large

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The plants are set in the soil about as deep as they stood in the nursery, though in light, hungry, or thirsty soils the roots should go a little deeper and in very heavy soils not quite so deep. Deep planting is a more common mistake than shallow planting, for roots, under most conditions, stand exposure better than over-deep planting, going down being more natural than coming up for a root seeking a place to its liking. The soil must be packed firmly about newly set plants, which is best done by tramping. Zeal in tramping diminishes as the hole is filled, leaving the top soil loose with a dust-mulch to prevent evaporation.

The reward of forethought in planting the home orchard

Watering at planting-time is necessary only when the land is parched by drought, or in regions where it must be irrigated. When necessary, water must be used liberally—a gallon or two to a plant. In place of watering many prefer to puddle the roots by dipping them in thin mud and planting with the mud adhering. In either watering or puddling the surface soil must be left loose and soft.

Newly set plants are seldom in need of outside nourishment. To put rank manure or strong fertilizers about the roots of young trees is inviting plant infanticide. If soil is to be enriched at planting-time, the fertilizer should be spread on the surface, to be cultivated in or to have its food elements leach down as rains fall.

Now comes the vexed problem of pruning the young plant. This is taken up in full in Chapter VII on pruning.

Care of the Young Plants During their tender nonage, the time between setting and the first fruiting, all plants must have a little special care. Young trees badly stunted at this time seldom recover. Fortunately, any departure from good health is easily told in young plants, for the color of the leaves is as accurate an index of health and vigor as the color of the tongue or the beat of the pulse is in man. A change from the luxuriant green of thrifty plant-foliage to the yellow hue, showing that the leaf-green is not functioning properly, is suggestive of ill-health.

Cultivation must be intensive, insects and fungi must be warded off, mechanical injuries avoided, and the plants that refuse to grow must be marked for discard. The summer care of the orchard the second and third season does not differ materially from that of the first, although there may be a little let-up in watchfulness.

Catch-crops and Cover-crops A catch-crop is a crop grown between the rows of another crop for profit from the produce. A cover-crop is a temporary crop grown to protect the soil or to enrich it when plowed under. Both catch-crops and cover-crops hold an important place in growing an orchard, whether large or small.

In the home fruit-garden some sort of catch-crop is almost certain to be planted each year until the trees come into bearing. Any and all vegetables may be grown among the young trees without detriment to them and to the end that the kitchen is well supplied with garden produce. Raspberries, blackberries, gooseberries, currants, and strawberries may all be interplanted with trees in the home orchard. Be it remembered, however, that land, to do duty by the two crops, must be both good and well fertilized, and that the care of both crops must be of the best.

There is no doubt of the value of the cover-crop in the orchard, when opportunity permits its planting. In home orchards, however, catch-crops of vegetables are so commonly grown that it is seldom that a cover-crop can be planted in time to be of any use. When land is vacant by the middle of the summer, some cover-crop ought to be planted to be turned under the next spring. This procedure will keep the land in better tilth, enrich it, and make it more easily worked.

Clover, vetch, oats, rape, rye, or buckwheat, all make good cover-crops. The seed must be sown in July or early August, the quantity being the same as when grown as a farm crop. The weather-map

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must be watched at sowing-time to make sure of a moist seed-bed. Whatever the crop, it should be plowed or dug under in the fall or early spring, and under no circumstances be permitted to stand late in the spring to rob the trees of food and moisture.

Clean cultivation produces a large crop

The Functions of Cultivation

The importance of cultivating the orchard is better realized when one considers the functions of that operation. The benefits derived from stirring the soil may be grouped under three heads: First, the physical condition of the land is improved because the soil is made finer, giving greater feeding surface to the plants; the depth of the soil is increased, thus enlarging the root-run of the plant; and the soil is made warmer and drier in the spring, when plant activities begin. Second, tillage conserves moisture by checking evaporation and by increasing the capacity of the soil to hold water. Third, tillage makes dormant plant-food available by decomposing organic matter, by promoting nitrification, and by making coarse soils finer.

An altogether secondary effect is the killing of weeds; but he is a sloven indeed who will permit weeds to disfigure the home orchard. The working necessary to secure the first-named conditions of the orchard will take care of the weeds.

It is true that very often the owner of the home orchard wants his trees in grass that he may better enjoy living under them, and he may not care to cultivate his small plantings. Almost every

CARE TAKING

fruit may be made to thrive in sod if special care is given. The grass in these orchards should be kept closely mown and used as a mulch about the trees. Commercial fertilizers, as well as a mulch, are absolutely necessary to sod-mulched trees, nitrogen in particular being required. The man who keeps his trees in sod must not expect as large a return of fruit, but, to offset this, it is usually better colored.

The Art of Tilling or Cultivating

There are several reliable guides to tell when trees need to be cultivated. The usual guide is the crop of weeds, but the man who waits until weeds force him to till is not doing his duty by his trees. The amount of moisture in the soil is a better guide. When soils become dry they need to be tilled. The physical condition of the land is another guide. Stir when the crust needs breaking and when there are clods to be pulverized.

Tillage should begin in early spring, when the land must be broken with a plow or deep-working harrow. This first operation is followed with a smoothing harrow, cultivator, or weeder, and tillage then proceeds at such intervals as conditions dictate, seldom less than once a fortnight, until time to sow the cover-crop in midsummer. A heavy rain should always be followed by cultivation, to prevent the formation of a soil-crust! He tills twice who tills quickly.

The depth to stir is governed by the nature of the soil and the season. Heavy soils need deep stirring; light soils, shallow stirring. In wet weather, till deeply; in dry weather, lightly. In some regions plowing and tilling may be made a splendid means of combating insects and fungi, and this regulates the depth to till.

The time and the season to stop tillage depends on the locality, the season, and the fruit. Generally, it may be said that cultivation should cease before fruits begin to attain full size

Early Richmond Cherries, half size

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and take on the color of maturity. For a mixed orchard in the North this is usually between the middle of July and the first of August—earlier the farther south. When fruiting plants are making a rank growth they do not need to be cultivated as late or as frequently as when making smaller growth. Cover-crop seed is covered the last time the orchard is gone over with the cultivator.

Is it Necessary to Fertilize the Orchard?

In the average orchard, if the land is well drained, well tilled, and well supplied with organic matter from stable-manure or cover-crops, commercial fertilizers are little needed. The exceptions are found on sandy and gravelly soils; in soils subject to drought; or on soils of such shallowness or of such mechanical texture as to limit the root-range of the plants; or in soils so wet or so dry or so devoid of humus as to prevent bacteriological activities in the soil. In the lighter soils of the South, peach trees, for example, are advantaged by the wise use of commercial fertilizers.

How may a fruit-grower know when his trees need fertilizers? He may assume that they need no additional plant-food if the plants are vigorous, grow well, and make a fair amount of new wood each season. If the plants are not of this healthful condition, the thing to

When trees are properly grown, the picking may all be done without ladders

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do is to look to the drainage, tillage, and health of the trees first, and to the more expensive and less-certain fertilizers afterward.

A Formula for Fertilizers As good a commercial fertilizer formula as any for the average plantation of fruit trees is: 350 pounds of acid phosphate and 200 pounds of muriate of potash to the acre, with 500 pounds of dried blood or 350 pounds of nitrate of soda to supply nitrogen. In lieu of these commercial fertilizers, and much better, from six to ten tons of well-rotted stable-manure might be used to the acre.

Commercial fertilizers should be applied in the spring as soon as the ground can be worked, spreading them about the trees over an area considerably greater than that covered by the spread of the branches. The manure should be put on before plowing; the fertilizers immediately after to be harrowed in. If the orchard is being double-cropped, these quantities of fertilizers must be increased somewhat to meet the double demand.

Trees Often Waste Their Substance in Riotous Living It is hard to wait for things to happen in an orchard, and the impatient tyro attempts to push his plants with heavy doses of fertilizer. Reveling in abundance, trees so treated delay fruiting still longer and lay waste their powers in luxuriant foliage and lusty wood. Truth is, the average soil of which home gardens are composed is a little too rich for most fruits. Putting fertilizer on such soils is like gilding the rose or throwing perfume on the violet.

“But fertilizers are good for farm crops and vegetables! Why not fruits?” It takes but a few words to answer the question.

Feeding Habits of Fruits Compared with Those of Farm Crops and Vegetables Trees have a preparatory time of several seasons before fruit-bearing begins; farm and truck crops make their growth, bear a crop, and pass away in a season. Trees begin early in the spring and continue to grow until late fall, so that fruit, leaf, and wood have a long time to develop; annual and biennial crops must develop in a much shorter time. The roots of trees run deeper and spread farther than those of succulent plants. Trees are very heavy drinkers and transpire water more rapidly than herbaceous plants, so that the nutritive soil-solution need not be so concentrated for fruits as for grains and vegetables.

CHAPTER V

SMALL FRUITS AND SMALL GARDENS

All the preceding suggestions relate to orchard practice adapted to small areas, it is true. They will be of little use to the man who has available only the rear of a little slice of land on which his home stands. Yet a part of a fifty-foot "estate," and even a section of a twenty-foot lot, can sustain fruit trees and plants that will add to the health and the happiness of the home-owner. Back-yard fruit-gardens are entirely worth while, and there ought to be a round million more of them in this fruit-hungry land.

Can any purchased peach, any shipped-in cluster of grapes, any market-bought strawberries or currants or blackberries ever have the flavor and the freshness of the home-grown product, watched to the moment of ripening, and gloated over with the joy of the grower? Food and flavor aside, the satisfactions, the fun, of growing one or two fruit trees to the production stage, or of hand-raising even a dozen fruit plants, are not computable in money.

Let no one, therefore, with even a few square yards of sun-swept ground available, miss the peculiar pleasures of home fruit-growing. Even though the place be rented, it is worth while to plant it, both for personal benefit and for increasing the fruitfulness of the land. In the hearing of the writer, a renter once berated himself for his selfish reluctance to spend a few dollars in fruit-planting the back yard of his rented property. He "saved" the trifle of money, but he lost all the benefit of fruit and pleasure his ten-year tenancy might have given him. A wiser and less selfish man, who never hoped to own, and who had lived a generation of time in a half-dozen rented homes, said, "I always stick in a peach tree and a grape-vine, and get some strawberry plants growing, and I've never regretted it."

Handling the Back Yard Theoretically, the narrow spaces, the often obtrusive fences, the aspect or the shade, are all against success with fruits in the smaller home areas. Practically and actually, astonishing prosperity often occurs to the trees, vines and plants which grow in un-ideal surroundings, having the advantage of loving care. These fruit-bearing items become the real friends of the folks who plant and tend them, and that friendliness is in evidence in the result.

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What is set down in these pages as to exposures, soils, fertilization, and the other details of fruit-growing is the truth, but it is also the truth that desirable fruit prosperity may occur under conditions which only approximate to the ideal. The man or woman with but a small area of land at his command is therefore urged to use it, going as far as he can toward providing the conditions here set forth.

Always the soil can be deeply dug, and usually some extra fertility can be supplied. A peach tree must have some sun, but a grape-vine will get along with less and can be trained up to shade the back door, if shade there is wanted. The "brambles"—raspberries, blackberries—can be grown almost against a fence. A dozen strawberry plants can be set in a square yard of space, and if the ground is fertile and the cultivation is good, the red fruit that ripens will be delightful. A dwarf pear tree can be caused to produce wonderful fruit in a corner, and for a little larger area there are fascinating possibilities in developing other dwarf fruit trees intensively.

Dwarf Fruit Trees

Indeed, the dwarf trees offer much fun and some fruit to the possessor of but a restricted area of land.

They are in variety and quality the same as the standard trees, but being grown on "stocks" or roots that restrict the plant-food supplied by the soil, they mature into fruiting at smaller size and often at an earlier date. They are advised as "fillers," and for getting a larger variety in a smaller space.

Dwarf fruit trees in a formal planting

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Even the smallest back yard can have a grape-vine

Any garden is "good" for small fruits, and almost any gardener. Lest some small fruit be left out in planning the garden, all must be named: the grape is the only vine; gooseberries and currants constitute the bush-fruits; four distinct species of raspberries (two reds, a black, and a purple) and several species each of blackberries and dewberries, together with the loganberry, make up the "brambles;" the strawberry, the only herbaceous fruit, completes the list.

Who Buys the Best, Gives Care the Best, May Have the Best

We are told that Nature is chary with her choicest products, only parting with them at the cost of much toil and trouble. She is accused, too, of spreading indifferent things before the eyes of indifferent mortals, and of reserving her loveliest and best for the few. These charges are not just as regards fruits. Choicely good fruits cost no more than poor or mediocre ones, and the labor of growing good and ordinary is much the same; so that, rich and poor, great and small, may feast on the loveliest and best.

The best varieties and good care are the fundamentals of success in growing small fruits. Methods matter less. Small fruits are easy to manage, and the grower can usually devise methods to suit his needs. The general instructions given in this primer cover all details of culture of vine, bush, and brambles, saving one—that of pruning. We come, then, to the pruning of these fruits.

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The grape literally "lives by the knife." The vine, when set, is pruned back to a stub of two eyes. Subsequent pruning depends upon how the vine is to be trained. If two fundamentals are kept in mind, the grape may be trained much as the grower wishes. These two fundamentals are:

Pruning the Grape

(1) *Grapes are borne only on shoots of the current year's growth which spring from canes of the previous year's growth.* (2) *Grapes naturally produce more bunches than will ripen well in proper size of berry and bunch and in quality of fruit.* Having selected the method of training on arbor, wall, or trellis, subsequent pruning is as follows: The spring after setting remove all but the best cane, and cut this back to three or four buds. The third spring the trunk of the vine should be established on wire or wall, and the pruner may now lay off permanent arms from the main stem to furnish a frame from which bearing shoots will grow. This third season a few bunches of grapes may be allowed to mature.

The vine is now established and subsequent pruning consists almost wholly of a thinning process whereby a certain number of buds are left for a crop for each season. The number of buds depends on the vigor of the vine and the variety. For vigorous sorts, as Concord and Delaware, from twenty to thirty buds must be left each season. These are divided equally among the bearing canes, which are usually two or four.

The pruner may further specialize by choosing between two methods of training the annual bearing shoots. These may be trained upright to wires above the canes from which the shoots spring, or they may be allowed to droop and hang down, instead of being tied to a support. In either case, it is often necessary to pinch back these shoots in midsummer to keep them within bounds, to rub off the buds that start from the main vine, and to remove such shoots as are not wanted for fruit-bearing.

Pruning the Bush-fruits

Currants and gooseberries bear fruit on wood that is two to three years old, after which the next two or three crops are the best. Pruning consists in keeping this best bearing wood constantly renewed. The plants must be kept open, also, that there may be plenty of air and sunshine. Pruning these fruits, then, consists in cutting out each year all wood more than four or five years old and all of the new growths except those necessary to replace that which is removed. The bearing wood should have all the dead and injured parts removed and should be thinned

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somewhat to let in sunshine necessary to ripen the fruit. The work is best done in the fall.

Pruning the Brambles

All brambles are heavily cut back in planting, not more than 6 to 10 inches of stem being left. The smaller and weaker the plant, the more it should be cut. Brambles are a compromise between a shrub and an herbaceous plant; that is, the canes have but one fruiting-season. Proper pruning is dependent on this habit—*old canes must be cut out as soon as they have fruited*. The work of pruning may be deferred until fall or winter, but it is better if done as soon as the crop is harvested. Brambles are all prolific in producing new canes, and these must be thinned, leaving not more than four or five for the fruiting-season. These fruiting-caness must be nipped back when they reach the desired height; that is, they should not be allowed to grow higher and then be cut back. So checking the growth causes the plants to throw out vigorous branches near the ground and makes well-balanced bushes. Red raspberries are an exception and should not be pinched back.

Directions for cultivating strawberries may be summarized as follows: The ground should be well drained if wet, plowed deeply, and enriched as for garden crops. The plants may stand as close as 15 inches apart each way, and hill cultivation is preferable. To

Set and train the berry plants properly from the beginning—

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obtain large, highly flavored fruit, pinch off the runners as fast as they appear, repeating the operation as often as necessary during the growing season. In the meantime, the ground **The Strawberry** should be frequently stirred. Where winter weather is severe, a covering of leaves, straw, or other litter is necessary. It should be placed over the plants as soon as the ground freezes and should be removed in the spring as soon as the plants begin to grow. Before the plants begin to ripen, the ground should be mulched with straw to keep the fruit clean and to prevent the ground from baking. A well-managed bed should give two full crops and should then be turned under, a new one having been prepared in the meantime to take its place.

Autumn-bearing Small Fruits The strawberry shows remarkable power to keep pace with the human family and adapts itself to human needs and moods in wonderful ways. Its latest adaptation is that of autumn-bearing, and he who will may have strawberries in September and October, as well as June and July. Autumn-bearing strawberries are planted and cared for as are ordinary sorts, with the exception that the blossoms that come in the spring must be removed, and, at the beginning of autumn weather, the plants must be stimulated into rapid growth by cultivation or irrigation.

A few sorts of raspberries bear a crop in the fall. The best of these is *Ranere* or *St. Regis*. The cultivator can do little to improve the fall-bearing habit—the variety, not the treatment, is the thing.

—and when they are old and laden with fruit you will be rewarded

CHAPTER VI

FRUIT PESTS AND ENEMIES

The proverb, "That evil is half cured whose cause we know," furnishes a text for opening the discussion of the pests of the orchard.

**Orchard
Enemies
Classified**

The subject is much simplified by a classification of orchard insects and diseases. These fall into three general types—insects, fungous diseases, and bacterial troubles.

Insects, in their turn, are divided into those which chew and those which suck. Chewing insects—caterpillars, worms, and beetles—are killed by poisons taken internally, of which arsenate of lead is

now sovereign of all. Sap-thirsty insects—the myriads of plant-llice and scales—are destroyed by caustic applications, of which the lime-sulphur mixture is now most used.

Fungous diseases, more diverse than the plants they grow on, for every plant has several or many, can be but roughly characterized by the damage they do. Usually a fungous disease shows in definite spots on leaf, fruit, or branch. Affected leaves and fruits often drop from the tree. Examples are apple-scab, the leaf-blights, black-knot, the mildews, and rots. Treatment is preventive and consists of covering the plant with some fungicidal mixture which stops the fungus from obtaining an entrance into the tissues of the host plant. Lime-sulphur and bordeaux mixture are the best two fungicides.

Bacterial diseases are the

A portable knapsack sprayer should be part of the equipment of every home garden.

FRUIT PESTS AND ENEMIES

troubles that wither, shrivel, or dry plants up like so many mummies. Pear-blight, peach-yellows and "little peach," the last two possibly not bacterial but at least constitutional troubles, are the best known. These desperate diseases require a desperate cure. The affected parts of plants must be destroyed to the uttermost. The lurking principle of death in these troubles may often be kept out by thorough orchard sanitation.

**A Pest for
Every Fruit—
A Spray for
Every Pest**

The destruction and annoyance wrought by insects and fungi are now the chief deterrents to amateur fruit-growing. Literally, there is a pest for every fruit, and for some there are several. Pests are more troublesome now than ever before, and new ones are still coming. Yet means have been devised to combat the old-timers, and as new ones come we learn how best to contend with them.

It is a fact that the result of this intelligent fight against orchard enemies has given us better fruit than our fathers ever knew. The spray-pump is a machine-gun, and there is ammunition for every pest. The advent of sprays for the pests of fruits is due almost wholly to the splendid efforts of experiment station workers. To the experiment stations the fruit-grower should go, then, for the latest and best advice on controlling pests. Bulletins, circulars, calendars, and leaflets describe every known enemy of cultivated plants and give information for their control; these may be had from a station in every state. A few pests are cosmopolitan and may be kept under, the

Even on the larger fruit-grounds the portable sprayer has its uses

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country over, by much the same treatment. For these front-line enemies the following spraying schedules furnish advice for effective control:

SPRAYING SCHEDULES FOR FRONT-LINE ENEMIES

Sprays for the Apple

1. *Dormant spray.*

Preferably when buds begin showing green tips.

Lime-sulphur diluted 1 to 9. For scale, blister-mite, and scab.

If aphids are hatching, add a tobacco extract, as in No. 2.

2. *Pink spray.*

When the blossoms first show pink, and flower-clusters are spreading.

Lime-sulphur, diluted 1 to 30. For scab or other diseases.

Add tobacco extract (40 per cent nicotine sulphate as "Black-leaf 40" commercially), $\frac{1}{2}$ pint to 50 gallons of water (1 tablespoonful to 3 gallons), for red bugs and aphids.

If leaf-eaters are present, add 3 pounds lead arsenate paste ($1\frac{1}{2}$ pounds powder) in 50 gallons of water. (About 1 oz. paste to each gallon of water.)

3. *Calyx spray.*

Start when two-thirds of the petals are off.

Lead arsenate, as in No. 2, for codling moth, and all eating insects.

Lime-sulphur, as in No. 2, for scab and leaf-spot.

If red bugs or aphids are present, add nicotine as in No. 2.

4. *Codling spray.*

If necessary, about two weeks after the completion of No. 3.

Lead arsenate and lime-sulphur as in Nos. 2 and 3.

For codling moth, all eating insects, scab, sooty blotch, apple-blotch, and fruit-spot.

5. *Late summer spray.*

If necessary, about last week in July.

Materials same as in No. 4. For second brood of codling moth, late-feeding caterpillars, scab, sooty blotch, apple-blotch, and fruit-spot.

Sprays for the Pear and the Quince

1. *Dormant spray.*

Preferably just as buds begin showing green tips.

Lime-sulphur, diluted 1 to 9. For scale, blister-mite, scab, and other diseases.

For pear psylla, apply the spray in a warm period in March or early April.

2. *Scab, or blossom spray.*

Lime-sulphur, diluted 1 to 30. For scab, leaf-blight, and leaf-spot. If eating insects are present, add 3 pounds lead arsenate paste ($1\frac{1}{2}$ pounds powder) in 50 gallons of water. (About 1 oz. paste to each gallon of water.)

For pear psylla, add tobacco extract (40 per cent nicotine sulphate), $\frac{1}{2}$ pint to 50 gallons of water. (1 teaspoonful to $1\frac{1}{2}$ gallons.)

3. *Calyx spray.*

Start when two-thirds of the petals are off.

Lead arsenate, as in No. 2, for codling moth, leaf-slug, and all eating insects.

Lime-sulphur, as in No. 2, for scab, leaf-spot and leaf-blight.

For pear psylla, add tobacco extract as in No. 2.

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4. *Codling spray.*

If necessary, about two weeks after the completion of No. 3.

Lead arsenate and lime-sulphur as in Nos 2 and 3.

For codling moth and all eating insects, scab, black-spot, and black-rot.

5. *Late summer spray.*

If necessary, about five to six weeks after No. 4.

Materials same as in No. 4. For second brood of codling moth, late-feeding caterpillars, scab, black-spot, fruit-spot, and black-rot.

Sprays for the Peach

1. *Dormant spray.*

In spring, before buds start.

Lime-sulphur, diluted 1 to 9. For San José scale and leaf-curl.

2. *Curculio spray.*

When calyces are dropping.

Lead arsenate paste, 3 pounds to 50 gallons of water, and 2 pounds lime, slaked (1 oz. paste to each gallon, and 2 ozs. lime to 3 gallons.)

Add tobacco extract (40 per cent nicotine sulphate), $\frac{1}{2}$ pint to 50 gallons, if aphids are serious.

A practical spray outfit for the small orchard or the community club

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3. *Brown-rot and scab spray.*

If necessary, three to four weeks after No. 2.

Self-boiled lime-sulphur (8-8-50).

If curculio is serious, add 2 to 3 pounds of lead arsenate paste to 50 gallons of water (up to 1 oz. per gallon of water.)

4. *Brown-rot and scab spray.*

If necessary, about four weeks before fruit ripens.

Self-boiled lime-sulphur (8-8-50).

Sprays for the Plum

1. *Dormant spray.*

Preferably just before buds open.

Lime-sulphur, diluted 1 to 9. For San José scale.

2. *Curculio and brown-rot spray.*

Just before blossom buds open.

Bordeaux (3-3-50) or lime-sulphur, diluted 1 to 40.

Add 3 pounds lead arsenate paste (1½ pounds powder) to 50 gallons, for curculio, bud-moth, green fruit-worm, and leaf-roller.

If aphids are serious, add tobacco extract (40 per cent nicotine sulphate), ½ pint to 50 gallons of water. (1 tablespoonful to 3 gallons.)

3. *Curculio and brown-rot spray.*

When the calyces are dropping.

Materials and pests same as in No. 2.

4. *Brown-rot spray.*

If necessary, two weeks after No. 3.

Materials as in No. 2. For brown-rot, leaf-spot, leaf-roller, green fruit-worm, and aphids, if serious.

Sprays for the Cherry

1. *Dormant spray.*

Preferably when buds begin bursting.

Lime-sulphur, diluted 1 to 9. For scale insects and fungous diseases.

For aphids, add tobacco extract (40 per cent nicotine sulphate), ½ pint to 50 gallons of water. (1 tablespoonful to 3 gallons.)

For tent caterpillar or curculio, add lead arsenate as in No. 2.

2. *Curculio spray.*

Immediately after petals fall.

Lime-sulphur, diluted 1 to 35, or bordeaux (3-3-50), for leaf-spot and brown-rot.

Add 3 pounds lead arsenate paste (1½ pounds powder) to 50 gallons, for curculio and slugs. (1 oz. paste to each gallon.)

Add tobacco extract as in No. 1, if needed for aphids.

3. *Brown-rot spray.*

When calyces are dropping.

Materials and pests as in No. 2, and especially for brown-rot and fruit-fly or maggot.

4. *Leaf-spot spray.*

Shortly after fruit is picked.

Lime-sulphur or bordeaux as in No. 2, to prevent defoliation by leaf-spot. Repeat about a month later if this disease is serious.

FRUIT PESTS AND ENEMIES

Sprays for the Grape

1. Shortly before blossoms open.
Bordeaux mixture (3-3-50), for mildew and black-rot.
Add 3 pounds lead arsenate paste ($1\frac{1}{2}$ pounds powder) to 50 gallons, if flea-beetles or curculio are prevalent. (1 oz. paste to each gallon.)
2. Just after fruit is set.
Materials and pests as in No. 1, but especially to control berry-moth larvæ and root-worm beetles.
3. Ten to fourteen days after No. 2.
Materials as in No. 2, for rot mildew, berry-moth, and root-worm.
For leaf-hopper, add tobacco extract (40 per cent nicotine sulphate), $\frac{1}{4}$ pint to 50 gallons (1 teaspoonful to 3 gallons), and apply so as to hit the young before they can fly.
4. If berry-moth, mildew, or rot is serious, repeat bordeaux and arsenate in two to three weeks.

Sprays for the Currant and Gooseberry

1. Soon after fruit sets.
Lime-sulphur diluted 1 to 40 and 3 pounds of arsenate of lead paste ($1\frac{1}{2}$ pounds powder) in 50 gallons of water (1 oz. to 1 gallon), for currant-worm and fungi.
2. After the fruit has been harvested.
Lime-sulphur as in No. 1, for fungi.

Spraying Material and Spraying Machinery

The owner of a home fruit-garden can hardly afford to prepare his own spraying material. There are but few communities in the country where ready-made sprays cannot be purchased better and cheaper than they can be made in a small way. Methods of using

usually accompany the material. It adds zest to the game, however, to prepare one's own material, and those so minded should begin the season's campaign during the previous winter by reading the latest teachings in experiment station literature.

It is well for every grower, no matter how small his plantation, to own his own spraying machinery. Here is a case, indeed, where "borrowing dulls the edge of husbandry." Spraying machinery is easily got out of gear and needs the particular attention of its owner to keep it ready for the fray. Pump and accessories must be kept complete, convenient, and clean, that the enemy may be attacked at the first advance. Handy and efficient spraying machinery is now common and cheap, and may be purchased from local dealers in nearly all farming communities. There is no one "best outfit."

FRUITS FOR THE HOME GROUNDS

1. Forewarned is forearmed. The grower must inform himself in advance as to the enemy he must fight, and be ready for it.

Slogans for Fighting Front- line Enemies

2. An ounce of prevention is worth a pound of cure. Most spraying is preventive rather than remedial, so that the grower must take advantage of time and the enemy.

3. Be a Gideon! The enemy is seldom seen, and his destruction is taken on faith. Gideon conquered by the might of his faith.

4. Make it hot for the enemy. Start the offensive and keep it.

5. A slacker makes a poor sprayer. All efforts go for naught unless the job is thoroughly done.

6. Straight shooting is a prime essential in spraying. The part to be protected must be hit.

7. Exterminate the enemy. Ruthless warfare in an orchard is not a crime.

8. He sprays twice who sprays quickly. The man who delays it is at the mercy of the enemy.

9. Be sure of your ammunition. A mistake in ammunition is a sword in the hands of a child.

Get the kind of sprayer to fit your needs and make spraying easy and effective

10. Make a sure base for the attack by studying the psychology of the enemy. Find out when and where and how he is going to attack; you can't study him in fighting-time.

Orchard Enemies Are a Filthy Crew Insects and fungi thrive in foul and filthy orchards. To

keep pests under, the grower must keep his grounds clean—free from weeds and dead, diseased, infested and infected parts of plants. Indeed, many pests can be kept under only by orchard sanitation, as, the dreaded peach-yellows, pear-blight, and several insects of the grape and apple.

CHAPTER VII

THE ART OF PRUNING

What is pruning? Why prune? The answer is that pruning is the removal of a part of a plant which is superfluous. The art, by the way, is an adaptation from Nature, who is a most pitiless pruner, as dead and dying wood in every tree and shrub proclaims.

Definitions

Taking a lesson from Nature, we can best make plain why trees must be pruned. Buds, twigs, and branches grow in such abundance in unpruned vegetation that they crowd, choke, and kill one another, only those stronger than the rest, or more fortunate in position, surviving. An unpruned orchard is full of dead or dying branches vainly stretching toward the light.

Pruning and Training Distinguished

Two quite distinct ends are obtained by pruning—to increase productiveness, and to increase the size and quality of the crop—this is pruning proper.

Plants are also pruned to make them well-proportioned and to give them such form that they may be easily managed in the orchard; this is training.

Pruning When Setting

When the tree is ready to plant, it is necessary to cut away part of the branches to enable the injured root-system to supply the remaining branches with water. The less the roots are injured the less the top need be cut away. Many make a mistake by cutting back all of the branches.

Stop a moment and think. The top buds on a branch develop soonest and produce the largest leaves. Now a newly set tree will grow best if it can develop a large leaf-surface before dry, hot weather sets in. Therefore, instead of shortening in all branches, cut away some of the branches entirely. The tree so pruned will start growth and acquire vigor more quickly, and a better top can be formed.

The peach is an exception, and young peach trees must have their branches cut back to two or three buds. Of course, too, very long branches of any fruit may be better cut back to reduce the tree to symmetrical or manageable shape.

The Height of the Head

A decisive choice must be made at the very start as to the height of the head. Shall the tree be low- or high-headed? The choice should usually be for a low-headed tree, for the reason that such a tree is more easily sprayed and

FRUITS FOR THE HOME GROUNDS

pruned; the fruit is more readily thinned and harvested; crop and tree are less subject to injury by wind; the trunk is less liable to injury by sun-scald, winter-killing, and parasites; the top is more quickly formed, and the low-headed tree soonest bears fruit.

By low-headed is meant a distance from earth to the first limb of from 1 to 2 feet. The peach may be headed at a lower distance; the plum, pear, and cherry somewhat higher; while the apple should approach the upper limit.

The Form of the Top

Two types of top are open to choice—the vase-form and the globe-form. In the vase-form the framework of the tree consists of a short trunk surmounted by four or five main branches ascending obliquely. In the globe-form the trunk is continued above the branches, forming the center of the tree. There are several modifications of each of these. In most climates the open-headed, vase-formed tree is best for the peach, and the close-centered, two-story tree is best for all other fruits. Whatever the form, the lowest branches should be longest, so that the greatest possible leaf-surface will be exposed to the sun and light.

Too Much Pruning

For several years after planting, the peach alone excepted, fruit trees need to be pruned only to train the tree. Just how much to prune young trees depends upon the fruit, the variety, the soil, and the climate. Fruit-

Prune so as to let in the sunshine

growers, as a rule, prune trees far too much, thereby increasing the growth of wood and of leaf-surface and delaying the fruiting of the plant. If trees were originally well selected, all that is needed is to remove an occasional branch which starts out in the wrong place—the sooner done the better—and to take out dead, injured, or crossed limbs. The peach, some plums, and some pears may need heading-in, and a weak or sickly tree may require somewhat more severe pruning.

THE ART OF PRUNING

A plant is "headed-in" when the terminal growths of its branches are taken off. Heading-in makes the top of a tree thicker and broader. In American climates this form of pruning is practised only with peaches and some plums, and is but little needed with other fruits.

The Use and Abuse of "Heading-in"

Peaches and some plums bear fruit on the wood of the past season. The crop is borne progressively away from the trunk. It is necessary to head-in these fruits to keep the bearing wood near the trunk. Apples, pears, most plums, and cherries are borne on spurs from wood two or more years old and, therefore, with these, heading-in need not be a regular practice.

Prune for Wood to Insure Vigor When the top of a tree contains dead or dying branches, or when the seasonal growth is short and scant, it may be taken for granted that the tree lacks vigor or, in old trees, is passing into decrepitude. Such trees may be rejuvenated by judicious pruning. In professional terms, they must be "pruned for wood." Such pruning consists in cutting back a considerable number of branches and in wholly removing others.

Pruning to increase vigor is based upon the fact that the development of leaves and shoots—vegetative activity—is dependent upon a constant supply of the soluble nutriment—the sap. Therefore, when the size of the tree-top is diminished, the remainder grows more.

When trees are enfeebled by age, injured by insects or fungi, or neglected in any way, there is nothing that will more quickly stimulate them and renew their youthful vigor than conservative surgery. Such pruning should usually be extended over two or more years.

In pruning for wood, the following rules must invariably be observed:

Weak-growing varieties should be pruned generously; strong-growing kinds, lightly.

Varieties which branch freely need little pruning; those having unbranching limbs should be pruned closely.

Be sure to have good pruning tools

FRUITS FOR THE HOME GROUNDS

In cool, damp climates, trees run to wood and need little pruning; in hot, dry climates, they need much pruning.

Rich, deep soils favor growth; prune trees in such soils lightly, so that growth is not stimulated excessively. In shallow, sandy soils, trees produce short shoots; the wood should be closely cut.

Pruning for Fruit

A barren tree can sometimes be made to bear fruit by proper pruning. Not infrequently barrenness is caused by over-manuring or over-stimulation of some kind, because of which the number of shoots and leaves are greatly increased, but flower-buds do not form. This over-production of wood and leaf can sometimes be stopped by breaking or cutting off the greater portion of the season's growth in late summer.

Summer-pruning must be done when the elongation of shoots has ceased for the season. If the tree is pruned too early the shoots cut back start growth and the operation has been useless. On the other hand, if the pruning is done too late there is not sufficient time to enable the food material to accumulate for the proper production of fruit-buds.

In America's inequable climate it is very difficult to practise summer-pruning successfully, and it is probably best, instead of cutting off the ends of the young shoots, to break them off and let them hang, cutting them in the winter.

Pruning Paraphernalia

A knife, a saw, and a pair of shears is the smallest possible equipment for tree-fruits, and to these must be added ladders for large trees. The cutting edges of all tools must be keen, so as to leave a clean, smooth cut that will heal quickly. Only a sloven will prune with a rusty tool.

Newly set 2-year
Apple ready to be
pruned

Same Apple tree
pruned

Newly set Peach
ready to be
pruned

Same Peach pruned.
Prune 1-year Apple
same way

THE ART OF PRUNING

The cut should always be made parallel with the main branch or trunk and as close to it as possible. A stub, even a short one, delays healing and leaves a place for rot-fungi. An

Making the Cut elementary rule of pruning is that the cut should be made just beyond a healthy lateral branch.

Large branches must be removed with exceeding care to avoid splitting or stripping the bark from the remaining parts, leaving bad wounds that can never heal. To prevent such a calamity, make an undercut a few inches out from the main cut, and then cut above; this leaves a stub which can then be removed, sawing close to the trunk without fear of disaster to the tree.

Nature's "Balm of Gilead" Professional pruners make a great ado about salving the wounds of pruned trees, for which purpose each has a particular "Balm of Gilead" to his fancy. At the New York Agricultural Experiment Station as many of these salves, ointments, paints, and waxes, as

Better than Man's could be collected were tried for a period of years on the apple, and lo, Dame Nature's balm was better than any of man's—wounds untreated healed more quickly and smoothly than any that were treated! If wounds, however, are larger than three inches in diameter, there is a danger-spot in the center of the wound where decay often sets in. It suffices to cover this spot with a good lead paint, keeping the paint at least half an inch from the outer edge.

The Time to Prune Pruning is often left to "time and chance," but there is a best time, which is late winter before the sap flows. The objection to early winter-pruning is that

there may be injury to the tissues near the wound from cold or from checking. The objection to late spring pruning is the loss of sap, and because the sap, in running down the bark, keeps it wet and sticky, making a suitable place for the spores of various rot-fungi.

Suckers or Water-sprouts When a tree on the decline is severely pruned, a growth of long, vertical, nearly leafless shoots often follows. Such shoots may also arise from over-manur-

ing or other causes which upset the equilibrium of the tree. These are suckers, or water-sprouts, and since the sparseness of foliage prevents the shoots from elaborating food, they appropriate it from the parts upon which they grow. Suckers are, therefore, robbers, true parasites, and should be removed whenever and wherever found.

CHAPTER VIII

FRUITS SUITABLE FOR CERTAIN SECTIONS

The attempt is made to put here in a few pages, by abbreviations, what, if written in full, would fill a sizable book. The plan is so simple that it needs no explanation except as to abbreviations and an outline of the fruit-regions of the territory embraced.

No sensible person will look upon such a list as infallible, and all will, the writer is certain, take the recommendations of varieties for regions as merely suggestive, to be qualified by opinions and experiences of fruit-growers and particularly in consultation with capable nurserymen within the regions.

FRUIT-REGIONS OF NORTH AMERICA

For the purposes of this booklet, North America has been broadly divided into six great regions as follows:

District No. 1, Northeastern America; No. 2, Southeastern America; No. 3, North Mississippi Valley; No. 4, South Mississippi Valley; No. 5, Northwestern America; No. 6, Southwestern America.

We repeat that consultation with the nurseryman and fruit-grower is the commonsense procedure.

Every home garden should have them as good

KEY TO ABBREVIATIONS

Form: c, conical; cp, compressed; h, heart-shaped; o, ovate; ob, oblate; obl, oblong; ov, oval; r, round; p, pyriform; obt, obtuse; obo, obovate. *Color:* a, amber; b, blushed; bl, black; c, crimson; d, dark; g, green; o, orange; p, pale; pu, purple; r, red; ru, russet; s, striped; w, white; y, yellow; v, very. *Size:* l, large; m, medium; v, very; s, small. *Quality:* b, best; g, good; p, poor; v, very. *Adhesion*—(stone-fruits): c, cling; f, free; sc, semicling. *Season:* e, early; l, late; m, medium; v, very. *Flavor:* a, acid; su, subacid; s, sweet; r, rich; v, very; m, medium.

Recommendations.—Varieties that will succeed in a given district are indicated by an asterisk (*); varieties highly recommended, by two asterisks (**).

POME FRUITS

APPLES

Name	Description						District recommendations					
	Form	Size	Color	Flavor	Quality	Season	1	2	3	4	5	6
Alexander	r-c	vl	g-y,r-s	a	g	m	**	*	**	..	**	*
Bailey Sweet	r-obl-c	l	vr,s	vs	vg	m	**	*	..	*	*	*
Baldwin	r-c	m-l	y,rs	su	vg	l	**	*	..	*	*	*
Banana	ob	m	y,b	msu	vg	l	**	*	*	..	**	*
Ben Davis	r-obl-c	m-l	y,rs	su	g	l	*	*	*	*	*	*
Blue Pearmain	r-c	vl	dr,s	su	vg	l	**	*	*	*	*	*
Bough	obl-c	m-l	g-y	s	vg	e	**	*	..	*	**	*
Buckingham	ob-c	m-l	g-y,rs	su	vg	ml	..	**	..	**	..	*
Chenango	obl-c	m	w,rs	su	vg	me	**	*	..	*	*	*
Delicious	obl-c	m-l	y,rs	ma	vg	l	**	**	*	*	**	*
Esoopp	r-obl-c	l	y,r	su	vg-b	ml	**	*	..	*	**	*
Fall Pippin	r-obl-ob	vl	y,g	psu	g-vg	m	**	*	*	*	*	*
Fameuse	r-ob	m-s	g,y,rs	su	vg-b	me	**	*	*	*	*	*
Gravenstein	r-ob	l	y,rs	su	vg	m	**	*	*	*	*	*
Grimes	r-ob	m	y	r,su	vg-b	ml	**	*	*	*	*	*
Jonathan	r-obl-c	m	y,rs	msu	vgb	ml	**	*	*	*	*	*
Lady	ob	vs	py,b-	su	vg	l	**	..	**	..	**	*
McIntosh	r-ob	m-l	w,y,r,c	su	g-vg	ml	**	**	**	*	**	..
Maiden's Blush	r-ob	m	py,b	su	g	m	**	**	*	*	**	*
Northern Spy	r-ob-c	l	g,y,rs	su	vg-b	l	*	*	**	*	*	*
Northwestern	r	l	y,g	su	g	ml	*	*	**	*	*	*
Oldenburgh	r-ob	m	w,y,rs	ba	g	me	**	*	**	*	**	*
Red Astrachan	r-c	m-l	g,y,r,s	a	g-vg	e	**	**	*	*	*	*
Red June	obl-c	m-s	y,r,c	msu	g-vg	e	**	**	*	*	*	*
R. I. Greening	r-ob-c	l	g-yg	ra	vg	ml	**	*	**	*	**	*
Rome Beauty	r-ob-c	l	y,rs	p,su	vg	ml	**	*	..	*	**	*
Stayman's Winesap	ob-c	m-l	gy,rs	rma	vg	l	*	**	..	*	**	*
Tolman	r-c	m	w,y,b	s	vg	vl	**	*	*	*	*	*
Tompkins King	ob-r-c	l	y,rs	su	vg	l	**	*	*	*	**	*
Wagener	r-ob	m-l	y,rs	bs	vg	l	**	*	*	*	**	*
Wealthy	r-ob	m	w,rs	bsu	vg	m	**	*	**	*	**	*
Williams	r-obl-c	m-l	dr	su	vg	me	**	**	**	..	*	*
Winesap	r-obl-c	m	dr	msu	vg	vl	**	**	**	**	**	*
Wolf River	r-ob-c	vl	g,y,rs	su	g	ml	**	*	**	*	**	*
Yellow Transparent	r-ob-c	m	py	su	g-vg	me	**	**	**	*	**	*
York Imperial	r-ob	m-l	w,cs	su	g-vg	ml	*	*	..	*	*	**

CRAB APPLES

Florence	ob	m-l	rs	a	vg	m	**	**	*	*	**	*
Hyslop	r-c	l	dr	su	g	..	**	*	**	*	*	*
Martha	ob	m-l	y	..	vg	..	**	*	**	*	*	*
Transcendent	r-obl	m-l	g,y,b	su	g	me	**	**	**	*	**	**
Whitney	r-c	l	y,rs	su	g	ml	**	*	**	*	*	*

POME FRUITS, continued

PEARS

Name	Description					District recommendations					
	Form	Size	Color	Quality	Season	1	2	3	4	5	6
Angouleme	obt-p	vl	g-y,ru	vg	m	**	**	*	*	*	*
Anjou	obl-p	l	g-y,ru	vg	ml	**	*	*	*	**	*
Bartlett	obl-p	l	y,b	vg	m	**	**	*	**	**	**
Bosc	obl-p	l	y,ru	vg-b	ml	**	*	..	**	**	**
Clairgeau	p	l	y,ru,b	g	ml	**	*	..	*	**	*
Clapp's Favorite	obl-p	l	y,r,b	g	m	**	*	*	*	**	**
Comice	r-o-p	l	g-y,ru	vg-b	ml	**	..	..	**	**	**
Flemish Beauty	obl-p	l	y,rb	vg	me	**	*	*	*	**	*
Garber	r-obl-p	l	y,ru	p	m	..	**	..	**	..	..
Kieffer	r-p	m-l	y,ru,b	p	ml	..	**	*	**	..	..
Lawrence	obo-p	m	y,ru	vg-b	l	**	..	..	**	**	**
Le Conte	obl-p	l	y	p	ml	..	**	..	**	..	..
Seckel	r-p	s	y-g,b,ru	b	ml	**	**	*	*	**	**
Sheldon	r-obl	m-l	g,ru	vg-b	ml	**	..	..	..	**	*
Winter Nelis	r-obo-p	m-s	y-g,ru	vg-b	l	**	..	..	..	**	**
QUINCES											
Champion	obo-p	l	y	g	l	**	*	..	*	*	*
Orange	r-ob	vl	o-y	vg	e	**	**	..	*	*	*

STONE FRUITS

APRICOTS

Name	Description						District recommendations					
	Form	Size	Color	Adhesion	Quality	Season	1	2	3	4	5	6
Blenheim	ob	m-l	o-y	..	g-vg	m	..	..	..	..	**	**
Hemskirke	r-ob-c	vl	o,rb	f	g-vg	ve	..	..	..	..	**	**
Moorpark	r	vl	o,rb	f	g-vg	m	*	*	..	*	**	**
Peach	r-c-oc	vl	y-o	..	vg	m	*	..	..	..	**	*
Royal	r-ob-c	l	y,o,rb	..	vg	ve	*	*	..	*	**	**

CHERRIES, Sweet

Name	Description					District recommendations					
	Form	Size	Color	Quality	Season	1	2	3	4	5	6
Bing	..	vl	b	vg	l	*	..	..	..	**	**
Centennial	o-h	vl	y,r	vg	..	*	*	..	..	*	**
Early Purple	r-h	s-m	p-bl	g-vg	ve	*	..	..	..	**	**
Lambert	h	l	pr	vg	ml	*	..	..	..	**	**
Napoleon	h	l	y,r	g-vg	m	**	*	..	*	**	**
Republican	..	m-l	b	..	vl	*	..	..	..	**	**
Schmidt's	..	vl	bl	vg	m	**	*	..	..	*	*

Ask the Nurseryman

He knows varieties

STONE FRUITS, continued

CHERRIES, Sweet, continued

Name	Description					District recommendations					
	Form	Size	Color	Quality	Season	1	2	3	4	5	6
Spanish	o-h	vl	py,b	vg	me	**	*	..	*	*	*
Tartarian	h	l	bl	vg-b	me	**	*	..	*	**	**
Windsor	h	m-l	bl	gog	l	**	*	..	*	*	*
Wood	r-h	m-l	y,b	vg	me	**	*	..	*	**	*

CHERRIES, Duke and Sour

Hortense	r-h	vl	r	vg	ml	**	*	..	..	..	..
Late Duke	oh	m-l	r-dr	g-vg	l	**	*	*	..	**	*
May Duke	r-h	m-l	r-dr	vg	e	**	*	*	..	**	*
Montmorency	r	l	r	vg	me	**	*	*	*	*	*
Morello	r-h	m-l	r-bl	g	l	**	**	**	*	*	*
Ostheim	o-r	m-l	dr	g	m	*	*	*	*	*	*
Philippe	r	m	dr	g	e	**	*	..	*	*	*
Richmond	r-ob	m	r	g	e	**	**	**	*	**	*

NECTARINES

Name	Description						District recommendations					
	Form	Size	Color	Adhesion	Quality	Season	1	2	3	4	5	6
Boston	r-ov	l	y,r	f	g	m	*	..	..	*	*	**
Downton	r-ov	m	g,r	f	g	ve	*	..	..	..	*	**
Early Newington	r-ov	l	g,r	c	vg	e	*	*	..	..	*	**

PEACHES

Alexander	r	m	w,rb	s-c	g	ve	*	*	*	*	**	**
Beer's Smock	ov	m-l	y,o-rb	f	g	..	**	*	..	*	..	*
Belle of Georgia	r-ob	m-l	w,rb	f	vg	e	**	**	..	*	..	..
Carman	r	l	w	..	g	e	*	*	*	*	*	..
Champion	r	m-l	w,rb	f	vg	me	**	*	*	**	*	*
Crawford's Early	r-ov	vl	y,rb	f	vg	me	**	*	..	**	**	**
Crawford's Late	r-ov	vl	y,rb	f	vg-b	l	**	*	..	**	**	**
Crosby	r	m-l	o-y,rb	f	g	ml	**	*	*	**	*	*
Elberta	r-ov	m-vl	y,rb	f	g	m	**	**	..	**	**	**
Greensboro	r	m	y,rb	s-c	g	e	**	**	*	**	..	..
Heath	obl-ov	vl	py,rb	c	vg	l	*	*	..	*	**	**
Lemon Cling	r-ov	vl	dy,rb	c	vg	m	*	*	..	*	**	**
Mountain Rose	r	l	w,rb	f	vg	me	**	**	..	**	*	*
Muir	r-ov	l-vl	y	f	vg	m	**	*	..	**	*	*
Oldmixon Free	r-ov	l	y-w,rb	f	vg	m	**	*	..	**	..	*
Salway	r-ob	l	y,rb	f	g	l	**	*	..	**	*	**
Smock	ov	l	y,o-rb	f	g	l	**	*	..	*	..	..
Stevens	r-ov	m	w,rb	f	g	ml	**	*	..	*	..	..
Stump	r-ob	vl	w,rb	f	g	ml	**	**	..	*	**	**
Triumph	r	m-l	o-y,rb	f	g	e	*	*	..	*	**	**
Tuskena	r-obl	m	y,rb	c	g	m	..	..	..	..	**	**

Many other varieties of the Peach are excellent, and it is always advisable to ask the Nurseryman to recommend those best adapted to the locality

STONE FRUITS, continued

PLUMS

Name	Description						District recommendations					
	Form	Size	Color	Adhesion	Quality	Season	1	2	3	4	5	6
Abundance	r-ov	m-l	o-y,br	c	g	me	**	**	*	**	..	*
Agen	obo	m-s	r-p	f	vg-b	l	**	..	..	..	**	**
Bavay	r-ov	m	y-g,r	f	b	ml	**	*	*	..	**	**
Bradshaw	obo	m-l	dpu	f	g	m	**	*	..	..	**	*
Burbank	r-c	m	o-y,r	c	g	ml	**	*	*	**	**	*
De Soto	r-obl	l-vl	r	c	vg	m	..	..	**	..	..	..
German	ov	l	pu	f	g	m	**	..	..	..	**	**
Giant	r-obl	vl	dc	f	g	m	..	..	..	..	**	**
Golden Drop	ov	l-vl	ly,r	s-c	g	m	*	..	..	..	**	**
Green Gage	ov	s	g-y-g	s-c	b	m	**	*	..	..	**	**
Imperial Gage	r-ov	m	y-g	f	vg-b	l	**	*	..	..	**	**
Italian Prune	obl-ov	m	dpu	f	vg	m	**	..	..	*	**	**
Lombard	r-ov	m-l	r-pu	c	g	me	**	*	*	**	*	*
Pond	ov	vl	r-pu	..	..	m	**	..	..	..	**	**
Red June	ov	m	pu-r	s-c	g	ve	**	**	*	*	*	*
Satsuma	r-c	m-l	dr	c	vg	ml	*	*	..	*	*	**
Shropshire	ov	s	pu	c	g	m	**	..	..	..	*	*
Washington	r-ov	m-l	g-y	f	vg	me	**	*	..	*	**	**
Wickson	r	m	r-p	..	vg	m	**	*	*	**	**	**
Wild Goose	r	m	r	c	g	m	*	*	..	..	..	..
Wolf	r	m	y,rb	f	g	m	*	*	**	*	..	..
Yellow Egg	ov	vl	py	c	vg	m	**	..	..	..	**	**

SMALL FRUITS

Name	Description					District recommendations					
	Form	Size	Color	Quality	Season	1	2	3	4	5	6
BLACKBERRIES											
Briton	r-ov	m	bl	g	m	**	..	*	*	*	*
Early Harvest	r-obl	s	bl	vg	e	**	**	..	**	*	*
Eldorado	obl	m	bl	vg	e	**	*	*	**	*	..
Erie	r-obl	m	bl	g	m	*	*	..	**	*	*
Kittatinny	r-obl	l-vl	bl	vg	ml	*	*	..	*	**	*
Mersereau	r-obl	l-vl	bl	vg	l	**	**	..	..	**	*
Loganberry	r-obl	l	pu	vg	..	..	..	..	..	**	**
Snyder	obl-ov	m-l	bl	vg	ml	**	*	*	*	*	*
DEWBERRIES											
Lucretia	obl-ov	vl	bl	vg	e	**	**	..	**	*	*
Mayes	c-ov	vl	bl	vg	vc	*	*	..	*	*	*
RASPBERRIES, Purple											
Columbian	r	vl	pu	g	e	**	*	*	*	..	*
Shaffer	r-ob	vl	pu	g	m	**	*	*	*	*	*
RASPBERRIES, Black											
Cumberland	r	l	bl	g	m	**	**	..	..	*	*
Gregg	r-ob	l	bl	g	m	**	*	*	*	**	*
Kansas	r	l	bl	vg	m	**	*	*	*	*	*
Ohio	r	m	bl	g	e	**	*	*	..	*	*
Plum Farmer	r	l	bl	vg	e	**	*	*	..	*	*

SMALL FRUITS, continued

Name	Description					District recommendations					
	Form	Size	Color	Quality	Season	1	2	3	4	5	6
RASPBERRIES, Red											
Cuthbert	r-c	m-l	r	vg	m	*	**	*	*	**	**
June	r-c	l	r	vg	m	**	**	*	*	*	*
Loudon	r-c	m-l	r	g	m	**	*	*	*	*	*
Marlboro	r-c	l	r	g	m	**	..	*	*	*	*
CURRANTS											
Cherry	r	vl	dr	g	m	**	*	**	*	**	*
Diploma	r	vl	r	g	m	**	*	**	*	**	*
Fay	r	vl	r	g	m	**	*	**	*	**	*
Perfection	r	vl	r	b	m	*	..	..	*	*	..
Red Cross	r	vl	r	vg-b	m	**	*	*	*	**	*
Red Dutch	r	m-l	r	vg	m	*	*	**	**	*	*
White Grape	r	l	w	vgb	m	**	*	*	*	*	*
Wilder	r	vl	y-w	g	m	**	*	*	*	*	*
GOOSEBERRIES											
Chautauqua	r,obl	l	y-w	vg-b	m	**	..	*	*	*	*
Downing	ov	m-l	pg	g	m	**	*	**	*	*	*
Industry	r-ov	vl	dr	vg	m	**	*	**	*	*	*
Pearl	r	m	g-w	vg-b	m	**	..	*	*	..	*
Poorman	..	..	..	..	..	..	..	..	*	..	..
Whitesmith	r-ov	l-vl	y-w	g	e	**	..	..	..	*	*
GRAPES											
Alexandria	obl	vl	y-w	vg	l	..	..	..	..	**	**
Black Hamburg	r-o	vl	bl	vg	m	..	..	..	..	**	*
Black Morocco	o	vl	bl	vg	l	..	..	..	..	*	**
Black Prince	o	ml	bl	vg	e	..	..	..	..	**	*
Brighton	r	l	r	vg	e	**	**	*	*	*	*
Campbell	r	l	bl	vg	e	**	*	*	*	**	..
Catawba	r	l	r-pu	vg	vl	**	*	*	*	*	*
Concord	r	m-l	bl	vg	m	**	**	*	**	**	*
Cornichon	obl	vl	bl	vg	l	..	..	..	..	*	**
Delaware	r	s	r	b	m	**	**	*	**	**	*
Diamond	r	l	g-w	vg	m	**	*	*	*	*	*
Emperor	obl	vl	r	g	l	..	..	..	..	*	**
Flame Tokay	r-o	vl	r	vg	m	..	..	..	..	**	**
Gordo Blanco	r	vl	w	vg	m	..	..	..	..	..	**
James	r	vl	bl	vg	vl	..	**	..	..	..	..
Janesville	r	m	bl	gp	e	..	..	**	..	..	..
Lindley	r-o	m	r	vg	m	**	*	..	*	*	*
Malaga	o	vl	w	vg	m	..	..	..	..	..	**
Memory	obl	ml	br	g	m	..	**	..	..	..	..
Mish	o	l	bl	g	ve	..	**	..	..	..	..
Mission	r	ml	bl	g	m	..	..	..	..	*	*
Moore	r	vl	bl	g	e	**	**	*	**	**	*
Niagara	o-r	l	pg	vg	m	**	**	*	**	**	*
Peru	r	vl	y-g	vg	e	..	..	..	..	**	**
Scuppernong	r	vl	pg	g	m	..	**	..	**	..	..
Sultana	o	m	y	vg	m	..	..	..	..	..	**
Sultanina	o	s-m	w-y	vg	e	..	..	..	..	*	**
Sweetwater	r	m-l	w	vg	e	..	..	..	..	**	**
Vergennes	o	l	r	vg	m	**	*	..	*	*	*
Winchell	r	m	w	vg	e	**	*	*	*	**	*
Worden	r	l	bl	vg	em	**	**	*	**	**	*
Zinfandel	..	..	bl	g	m	..	..	..	..	*	**

CHAPTER IX

CONSERVATION AND THE HOUSEWIFE

To get the most out of the home fruit-garden, the housewife must promote the good works of the husband by generous use of fruit throughout the year for the family good. Production and conservation are being preached everywhere. To do his duty by his family and his country, the man who owns land must produce, and the housewife, to do her home and civic duty, must preserve.

The Housewife's Part

Conserving by Storing

The preferred use for any fruit is to eat it as Nature produced it, unsullied by the arts of man. Now, fortunately, greenness, maturity, and decay grade so slowly and insensibly into each other that some fruits may be kept months without deterioration, and, quite to the contrary, improve by the keeping.

The ideal method of keeping apples and pears is to put them in cold-storage, bringing them out as needed. So kept, apples and pears are as fresh and delectable, for the most part, the winter through as when they naturally come to maturity. Few, however, have cold-storage facilities and must rely on common storage.

Common storage for winter varieties of apples and pears is simple if a few requirements can be met. These are, that the fruit be kept in a cool place, neither too wet nor too dry, where it cannot absorb odors from vegetables or other products. The ideal temperature is just above the freezing-point, but these fruits may be kept long and well in cellars where the temperature occasionally goes up even to 45° or 50° Fahr. Windows that can be opened and closed, as occasion requires, help wonderfully in controlling the temperature. The moisture can be controlled by having a dirt-floor or by occasionally sprinkling a cement floor. In such a cellar, fruit may be stored unwrapped. More often, however, each apple or pear will better be wrapped with paper to conserve moisture, which, at the same time, keeps out odors and prevents the spread of decay.

In any case, the safest procedure is to wrap choice fruit in newspaper and pack in barrels, boxes, baskets, or bins. In a very dry room it pays to line the boxes and barrels with paper and to keep them tightly covered. Pears are preferably stored in shallow trays or drawers. Late-ripening grapes, by the way, protected as described

CONSERVATION AND THE HOUSEWIFE

above and put in shallow receptacles, may easily be kept until mid-winter. It is useless to store bruised, diseased, decayed, or over-ripe fruit, thus courting failure.

Canning— Conservation in Excelsis

Canning is the simplest of operations. It consists in keeping a food-product airtight after the bacteria have been destroyed by heat. Modern methods make canning so easy that children can foods, as children's canning clubs the country over attest. Fruits, in particular, are easily canned, every fruit of the orchard being suitable. Principally, the fruit is canned either by the open-kettle or the cold-pack methods.

In the open-kettle method the product to be canned is cooked in an open kettle and then put into sterilized jars and sealed. All fruits may be so canned. The jars, and also the rubbers and covers, must be sterilized by boiling for ten minutes, before the fruit is put in them. Usually, the fruit is cooked in a sugar syrup of varying sweetness. This is the old-fashioned method, known by every housewife.

The cold-pack method consists in packing the raw or blanched product into the jar, surrounding the material with liquid, and cooking in boiling water. It is, on the whole, the more satisfactory method, because it saves time and labor, and because either fruit, vegetables, or meat keep indefinitely if sufficient time is given to the processing. A wash-boiler, or a deep pan with a tightly fitting cover, makes a good home-made canner, if a rack is used to prevent the jars from resting on the bottom. There are excellent commercial

Kieffer Pear

FRUITS FOR THE HOME GROUNDS

outfits now available. Fruits canned by the cold-pack method are usually packed with syrup, but hot water alone may be used and the sugar added when the fruit is served.

Drying the Cheapest Method of Conservation

This is the cheap and easy way of conserving surplus fruits from the home fruit-garden, for drying requires neither sugar, spice, nor special containers; the product is condensed, thereby saving storage-space; and it may be kept indefinitely.

Fruits are easily dried in four ways: In the sun; by artificial heat in an oven or dryer; by an air-current made by an electric fan; or by combining any of these methods.

In dry, hot weather, sun-drying is cheapest and easiest. The prepared fruit is spread on wire or netting trays, covered with netting to protect them from insects, and exposed to the sun in open air.

In cloudy weather, artificial heat must be used in oven or dryer. Full directions for use come with the commercial dryers. In the kitchen, the prepared fruit is kept in a warm oven, on platter or pan, with the oven-door open for thorough ventilation; or the drying process may be started in the oven and completed in the sun.

The following rules must be observed in drying: 1. Use the best material. 2. Work as rapidly as is consistent with good results. 3. Slice large fruits to get large drying surfaces. 4. Do not overheat in oven or dryer—the heat should never

exceed 140° Fahr. 5. Stir frequently to insure even drying. 6. Keep the fruit free from dust and insects. 7. Bring sun-dried fruit indoors at night to avoid dampness. 8. Dry thoroughly before storing and so prevent molds.

Preserves How preserve? Before me lies a treatise giving, 1,001 recipes for preserving fruits. Bulletins, circulars, magazines, newspapers, and demonstration schools vie in giving recipes. All who will may learn how to preserve—even in the manner of the old days and with the old-time flavors. We urge that the times are now propitious for a groaning pantry of jams, jellies, fruit-butters, fruit-pickles, fruit-juices, marmalades, shrubs, compotes, ratafias, spiced fruits, and candied fruits.

Fruit-juices A long-neglected resource of the fruit-grower is just coming into its own—unfermented fruit-juices. Cider, it is true, has been a drink for the thirsty of all ages. And what drink goes better on a cold winter's night?

Much of the fruit that is lost each year through inability to make use of it at once may be saved by making wholesome, pleasant fruit-juices. These juices can be used as daily drinks, in sickness, convalescence, and in many ways in the preparation of foods and ices. Moreover, fruit-juices are true liquid foods, second only to milk.

Making fruit-juices is as simple as canning. As in canning, a sterilized product is hermetically

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sealed in a sterilized container. Juices, however, can be satisfactorily sterilized without boiling, a temperature of 200° Fahr., or a little less, sufficing. Boiling, it is well to remember, impairs the flavor. Methods of expressing the juice and sterilizing juice and container are varied, but all are simple. Observing the principles set down above, any ingenious person can devise methods and expect success.

A LAST WORD

The fruit-grower may escape from many pitfalls and avoid many quagmires by keeping in touch with his state experiment station. The true fruit-grower, too, must have books—not one, but many—for he must see his orchard through many eyes. He must have, too, illustrated catalogues of nurserymen, and makers of horticultural implements.

Another last word! The fruit-garden must never be finished. To change and plant and plan constitute the chief delights of gardening. “To travel hopefully is a better thing than to arrive,” says Stevenson. Traveling hopefully in an unfinished orchard is better than arriving, no matter how happily one arrives. Even frustrated hope and brave failure have their rewards. But away with failure! The hopeful traveler ever leans to the sunny side.

This little treatise has been prepared for the American Association of Nurserymen by an impartial fruit authority. The suggestions given are from long experience, and they may be used best when consultation also is had with a capable nurseryman.

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