



# Tree Fruit for Oklahoma

OSU  
Collector

Circular 452

EXTENSION SERVICE,  
OKLAHOMA A. AND M. COLLEGE,  
SHAWNEE BROWN, *Director*  
Stillwater, Oklahoma

## TREE FRUIT FOR OKLAHOMA

E. L. WHITEHEAD  
Extension Horticulturist

A home orchard properly planned, planted and cared for is one of the most valuable and appreciated farm enterprises. If the orchard does not receive proper care, however, it will be neither profitable nor a source of pleasure. At least 90 percent of the communities in Oklahoma do not produce their tree fruit needs.

Generally it can be said that apples, peaches, plums, pears and sour cherries are adapted throughout the state. Where the moisture supply and soil conditions are favorable, commercial production is possible. Sweet cherries do not endure our hot dry summers. Apricots and Japanese plums bloom so early that they are usually killed by late spring frosts.

Once fruit pests were not as prevalent in Oklahoma as at present. A well-planned pest control program is a necessary part of every fruit production program. Fruit production is a specialized business requiring some skilled labor, adequate spray machinery, spray materials, and proper equipment. An orchard is a long time investment, requiring a five to ten year growing period before it starts paying returns. Two of the biggest problems facing the tree fruit planter in Oklahoma are the late spring frosts and summer drouths.

### LOCATING THE ORCHARD

The home orchard should be located near the farm headquarters where it can be fenced off from the other fields. In locating a commercial orchard several factors, in addition to soil type, should be considered. Such problems as access to markets, condition of roads, available labor supply for harvest season, and ample supply of water are very important and must be considered.

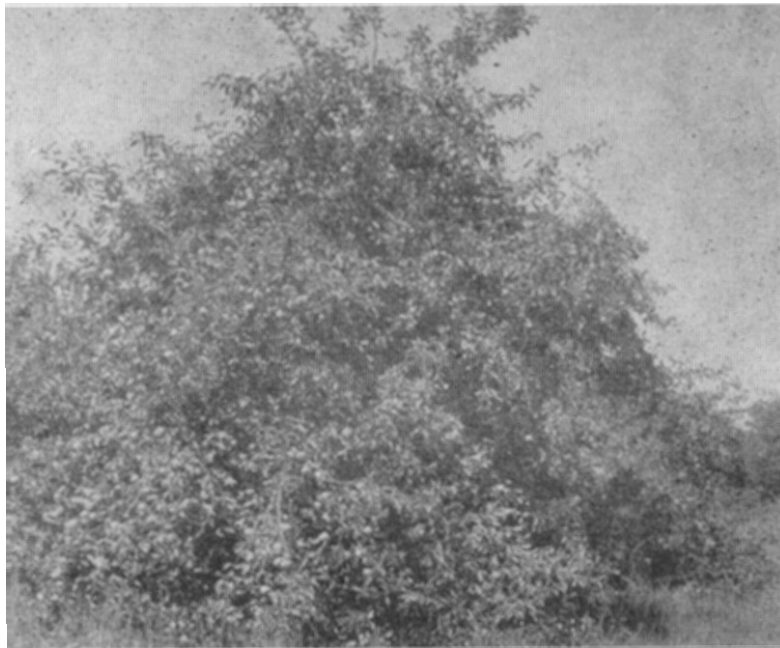
*Site*—A good orchard site is sloping enough to provide good air drainage. Fruit trees, especially peaches, bear more regular crops if planted on north slopes in Oklahoma. Soils of north slopes do not warm up as early in the spring, which causes the trees to bud out later, and, therefore, miss late spring frosts some years. Avoid locating an orchard in a low flat area where air drainage is poor. It is never advisable to plant a new orchard near old diseased fruit trees unless these are removed and burned.

Windbreaks in the west half of the state are helpful. Fruit trees should not be planted closer than 60 feet to the windbreak. The competition for moisture is too great.

*Soils*—Deep sandy loam soils, ranging from sandy clay loams to coarse sands or gravel mixtures, are good fruit soils if they meet the requirement as to location. The subsoil should be open and porous enough to permit good root development and also allow for the free movement of air and water. Fruit trees should be planted only on well-drained soils. A good guide to follow is the growth of native trees in the locality on the types of soil under consideration. Trees set on newly cleared land are likely to die from root rot and termites. Such land should be row cropped for at least three years before fruit trees are planted.

#### PLANNING THE ORCHARD

To avoid costly mistakes it is well to plan the prospective orchard with utmost care. A carefully worked out plan, drawn to scale on paper, will avoid many costly mistakes. The plan becomes a permanent record of the kinds and varieties of trees planted and their location in the orchard. It helps determine the exact number of trees of each variety needed to plant the



**Fig. 1.**—A mature well shaped apple tree supporting a heavy fruit load. This tree occupies its share of a 40 x 40 feet spacing. Note sod cover.

orchard. Identify each tree on the plan and indicate planting distances, boundaries, etc. Such explanatory notes as date of planting, age of tree, where purchased, etc., should be included in the plan as a matter of record.

*Planting Distances*—It is important to space trees properly. The universal error made in establishing an orchard seems to be the planting of the trees too close together. This is easy since trees are small when first transplanted. Give each tree adequate room for normal development. Remember that tree roots extend and feed far beyond the spread of branches. Thus, when the branches touch in the row beneath, they are competing with each other for plant food and moisture.

The following table lists the recommended planting distances for various fruits, and the approximate number of trees required to plant an acre at various spacings. The actual number of trees needed to plant an acre will vary depending on the shape of the plot and whether or not rows are contoured. Actual location of the trees to scale on the orchard plan is the only way to determine the exact number needed.

Fruits	Suggested Planting Distances	Approximate Number trees needed per acre
Plums and Sour Cherries	20 x 20 feet*	109
	25 x 25 feet	70
	25 x 30 feet	59
Peaches	30 x 30 feet	48
	30 x 35 feet	41
Apples and Pears	30 x 35 feet	41
	35 x 35 feet	35
	35 x 40 feet	32
	40 x 40 feet	27

\* Not recommended except for semi-dwarf varieties such as Opata and Sapa plums.

Size of the orchard to be planted will depend on a number of things. Tree farming is a specialized business. Commercial orchards smaller than 10 acres are seldom desirable because of the high overhead costs of machinery. Market outlets, reasonable and adequate financing, available transportation facilities, the supply of skilled labor, equipment, and the general location of the prospective planting must all be considered. In general the commercial planting should be big enough to employ at least one skilled laborer the year around other than the owner or operator. Many orchard jobs require two men.

Most home fruit plantings are too large for strictly home requirements, and too small for a paying commercial enterprise. Thus, proper care becomes burdensome, and the result is a neglected planting. Home orchards ranging from a fourth to half an acre in size are large enough for the average farm. From 20 to 30 trees will supply all the fruit needed by the average family, even though all the trees seldom bear full crops. Plantings of 6 to 8 apple trees, 6 to 8 peach trees, 4 to 6 plums, 3 to 5 cherry trees, and 2 to 3 pear trees will supply season long fruit for fresh use, most years, plus abundant supplies for canning, freezing, storing or otherwise preserving.

*Selection of Kinds and Varieties*—Selection of kinds and varieties to plant is not easy. Every planter wants to plant dependable trees that will bear reasonable crops during the average season.

The commercial planter is interested in supplying stable market outlets, either close at hand or at some distance that can be reached quickly by dependable transportation facilities. Varieties selected for commercial planting must ripen fruit during the period when market demands are best. The fruit must also be of such quality and characteristics that it can be handled to reach the market in an attractive, usable condition. As a rule commercial plantings should be restricted to blocks of a small number of varieties that ripen close together. Too, the different kinds of tree fruits included in the planting should be selected to avoid overlapping harvesting periods insofar as possible. This does not mean that the orchard should be restricted to a planting that will have but a single marketing period. It does mean however, that the varieties planted should be selected with regard to volume production at definite periods during the season. This way marketing can be carried out in an orderly manner. A planting might include a block of early ripening white peaches and a second block of yellow mid-season varieties or blocks of early and late ripening apples might be handled along with mid-season peaches. Stagger peak marketing periods to avoid overlapping ripening seasons of the various fruits included in the planting.

Home plantings are established to provide fruit throughout the season. The selection of early, mid-season and late ripening varieties of the majority of the tree fruits is desirable. Quality is of first importance in the varieties for home planting, since the fruit does not have to be packed and shipped.

Attention must be given to pollination in both home and commercial plantings. Most tree fruit varieties are self-sterile, and many are intersterile. Also, most fruits are pollinated by insects, the principal one being the honey bee.

In selecting varieties for a commercial planting give special attention to the matter of adequate pollination. In the case of apples, at least one tree in nine should be a good pollen producer. Since home plantings contain an assortment of varieties, pollination is usually adequate. A hive of bees will assure pollination, and is an asset in any orchard. One hive to each acre of a commercial planting is regarded as standard "equipment" by successful growers.

Many tree fruit varieties are adapted to Oklahoma conditions. Varieties are available that ripen at any season desired. The following are those varieties most dependable from season to season, based on observations, growers' experiences and experimental tests. As a matter of information several varieties are described which aren't especially adapted here in the state. Varieties are listed according to their ripening season. *Those in italic type are suggested for home plantings, and those in italic type plus an asterisk (\*) are suggested as desirable for either home or commercial plantings.* The ripening time indicated is for the central part of the state.

#### TREE FRUIT VARIETY DESCRIPTIONS

##### APPLES:

1. *Yellow Transparent\**—Yellow, productive, good sauce variety, frequently used for canning. Partially self-fruitful, better if cross pollinated, is a good pollinator for other early varieties. Ripens during late June.
2. Early Red Bird or Red Bird Early—Red, fruit inclined to be sour, ripens irregularly, quality only fair. Ripens during early July. (Not recommended.)
3. Early Harvest—Yellow, small fruit, fair quality, ripens irregularly, produces too many cull apples. Ripens during early July.
4. Lodi—Yellow, similar to Yellow Transparent but larger. Not recommended as trees are quite variable in behavior. Ripens during early July.
5. *Henry Clay\**—Green, productive, develops quickly. Good cooking apple. Often sold green. Ripens during early July.
6. Early McIntosh—Red, productive, good eating quality for early variety, inclined to be alternate bearer, cannot be recommended until tested further. May be planted to limited degree in home orchards. Partially self-unfruitful. Ripens in July.
7. Wilson Red June—Red, attractive fruit of fair quality, inclined to be irregular in bearing habit. Ripens during late July.

8. *Crimson Gravenstein*—Red, medium to large size fruit, good quality apple. Not recommended due to irregular bearing habits. Ripens in July.

9. *Summer Champion*\*—Red, large cooking apple, very productive. Ripens in August.

10. *Ada Red*—Red, attractive medium sized apple, good cooking, fair quality. Ripens in August.

11. *Maiden Blush*—Pale yellow with slight blush, fruit inclined to be small, quality good, ripens irregularly, very subject to blotch disease. Ripens in August. (Not recommended.)

12. *Jonathan*\*—Only red selections such as *Black Jon*, *Jonard*, etc.,—Red, attractive, high quality cooking or eating apple. Red sports desirable. Slightly self-fruitful, requires cross pollination. Good pollinator for other varieties. Ripens in late August. May be stored.

13. *King David*—Red, very attractive, starts producing early and is very productive. Inclined to be small. Will not compete with *Jonathan* as commercial sort. May be stored. Ripens during late August.

14. *Red Delicious*—Only red selections *Starking*, *Richared*, *Double Red*, etc.—Red. Large and attractive, high eating and cooking quality. Red sports desirable. Entirely self-unfruitful. Must have cross pollination. Is, however, a good pollinator. Ripens in September. May be stored. (Plant with *Jonathan*.)

15. *Grimes Golden*—Yellow, small to medium size, good eating and cooking quality, tree none too hardy, plant only double worked trees. Partially self-fruitful, good pollinator. Ripens during late September.

16. *Golden Delicious*\*—Yellow, medium to large in size, productive, of good quality. Self-unfruitful. Must have cross pollination. Is, however, a good pollinator. Ripens in late September. May be stored. (Plant with *Jonathan*.)

17. *York*—Red with faint stripes, medium to large size, good cooking and fair eating quality, inclined to be shy bearer while young. Ripens during late September.

18. *Turley*—Red, large and productive, of good quality. Similar to *Stayman* but does not crack. May be stored. Ripens during late September.

19. *Stayman*—Also red selections *Stamared*, etc.—Red, fruit medium to large of good quality. Very subject to cracking during ripening season. Slightly self-fruitful, requires cross pollination, is poor pollinator. Ripens during late September. (Not recommended.)

20. *Mammoth Black Twig\** and *Paragon\**—Red, large apple of good quality, good keeper, somewhat irregular in bearing. Requires pollination. Ripens during October.

21. *Winesap\**—Red, medium sized apple of high eating quality. Good storage apple. Entirely self-unfruitful. Requires cross pollination. No good as a pollinator. Ripens in October. (Plant with Jonathan.)

22. *Gano*, *Black Ben* and *Den Davis*—Red striped to dark red, medium to large size, low eating quality, fair cooking apples, good keepers, good pollinating varieties. Ripen during October.

#### PEACHES:

##### *White Varieties.*

1. *Mayflower*—White clingstone, red low quality. Ripen after mid-June.

2. *Early Wheeler*—White clingstone, red, large attractive, very low quality, fairly hardy. Ripens after mid-June.

3. *Early Red Bird*—White clingstone, red, very similar to *Early Wheeler*. Ripens after mid-June.

4. *Early Rose*—White clingstone, red, only medium quality. Frost hardy in bud. Sometimes bears crops when most varieties freeze out. Ripens late June.

5. *Carmen*—White semi-clingstone, red, good quality, almost freestone when fully ripe. Frost hardy in bud. Ripens in early July.

6. *Champion\**—White freestone, red, large, good quality. Frost hardy in bud. Ripens in early August.

7. *Belle of Georgia\**—White Freestone, red, medium size, good quality canning variety. Ripens mid-August.

8. *Chinese Cling\**—White clingstone, good quality. Frost hardy in bud. Ripens in mid-August.

##### *Yellow Varieties.*

1. *Golden Jubilee*—Yellow freestone, red, medium sized fruit, one of the better early yellow sorts. Ripens in mid-July.

2. *Fair Beauty*—Yellow, semi-freestone, red, high quality peach, excellent when fully ripe but soft. May be planted for local sales. Ripens mid-July.

3. *July Elberta\**—Yellow freestone, red, medium sized fruit of high quality. Inclined to overbear during frost free years. Requires thinning, ripens after mid-July.



4. *Red Haven*\*—Yellow freestone, bright red, medium to large size, good canning and freezing peach. Inclined to overbear during frost free years. Requires thinning. Ripens after mid-July.

5. *Hale Haven*—Yellow freestone, red, large, good quality. Has tendency to overbear during frost free years. Requires thinning. Good canning and freezing peach. Ripens after mid-July.

6. *J. H. Hale*\*—Yellow freestone, red, large, good quality canning peach, requires another variety for cross pollination. Ripens early August.

7. *Elberta*\*—Yellow freestone, red, good quality. Popular commercial variety. Ripens mid-August.

8. *Shipper's Late Red*—Yellow freestone, red, fair quality. Follows Elberta season closely. Ripens after mid-August.

9. *Late Crawford*—Yellow freestone, fair quality. Follows Elberta ripening in late August.

10. *Frank*—Yellow clingstone, heavy producer of fair quality. Ripens in early September.

11. *Indian Cling*—Red Fleshed clingstone, red, medium to large in size. Frost hardy in bud. Selections ripen at different times. Majority, however, are late September peaches.

#### PLUMS:

1. *Bruce*\*—Clingstone, yellow flesh, red, large size, ripening over long season. Good local market variety, fair quality. Ripens mid-June.

2. *Opata*—Clingstone, green flesh, purplish red, medium size, heavy producer. Tree dwarf and comes into bearing early. Ripens after mid-June.

3. *Sapa*\*—Clingstone, purple flesh, purplish red, very much like Opata. Ripens after mid-June.

4. *America*\*—Clingstone, yellow flesh, red, medium to large in size, fair quality. Ripens in late June.

5. *Gold*—Clingstone, yellow flesh, yellow, medium to large size, fair quality. Ripens during early July.

6. *Hanska*\*—Freestone, yellow flesh, red, medium size, good quality eating and canning plum. Ripens in mid-July.

7. *Lombard*—Freestone, green flesh, purple, medium to large size, good canning plum. Ripens during late July.

8. *Damson*—Freestone, green flesh, purple, small very astringent until fully ripe, good for canning and preserves. Ripens in September.

**SOUR CHERRIES:**

1. *Dyehouse*—Small size, dark red, sour, good quality, shy bearer. Ripens during early May.
2. *Early Richmond*—Small, light red, sour, fair quality. Ripens around middle of May.
3. *Montmorency*\*—Medium sized, dark red, sour, good quality canning cherry. Ripens during late May.
4. *Suda*—Small red, sour, fair quality, hardy tree, adapted in western counties. Ripens early June.
5. *Wragg* or *English Morello*—Small, dark, red, sour, good quality when cooked. Hardy tree. Ripens early June.

**PEARS:**

1. *Douglas*—Early bearer, medium size fruit, low quality, somewhat resistant to pear blight. Ripens during late August.
2. *Lincoln*—Good quality early ripening pear, subject to pear blight. Ripens during August.
3. *Garber*\*—Large apple shaped pear, fair quality, tree large and late in bearing habits, subject to pear blight. Plant with *Kieffer* for pollination. Ripens during mid-September.
4. *Kieffer*\*—Hardy variety of medium quality, should be ripened off the tree, somewhat resistant to pear blight. Requires cross pollination. Ripens in late September.
5. *Seckle*—Small high quality pear, somewhat tolerant of pear blight, its small size and late bearing are main disadvantages. Requires cross pollination. Ripens during late September.
6. *Bartlett*—Yellow pear of high dessert quality. Not adapted to Oklahoma climatic conditions. Susceptible to pear blight. Ripens during late September.

*Purchasing Trees*—Deal direct with reliable nurseries, preferably those near at hand. There is no advantage in securing trees from a distance. The important item is to get live healthy, well grown trees of the varieties specified. Buy trees of first quality. Apple and pear trees five to seven feet high, having a few side branches and trunks from 9/16 to 11/16 of an inch in diameter at the ground line are best. Such trees will usually be two years old, although some nurseries produce them in one season. Use well grown one to two year old peach, plum, and cherry trees. Do not accept variety substitutes. Determine varieties to be planted with care and insist on them. Submit the complete list of trees

needed for the orchard to several reliable nurserymen and ask for bids. Savings are often realized on bulk orders. Place tree orders well ahead of the time they are to be planted. Early orders are more readily filled, especially if some of the varieties needed are scarce.

#### PREPARING THE SOIL

If the orchard site is sloping enough to be subject to erosion, and most sites will be, terrace it well in advance of planting to prevent erosion and to conserve moisture. Contour farming is as important in the orchard as in any other field on the farm. Trees should be set in contour rows between the terraces, or set in straight rows as if terraces were not present, offsetting or leaving out those trees that fall directly in the drainage channel of the terrace. In many terraced orchards trees are set directly on the terrace ridge where they grow well, but it is more difficult to cultivate uniformly and equally difficult to maintain or repair the terraces. It is well to leave enough space along the terraces for them to be reworked in case they need repairs. In no case should trees be set in the drainage channel of the terrace.

Before trees are planted, plow the soil around eight inches deep and prepare it as though it were to be seeded to a grain crop.

Since trees do best on soils of medium fertility it is desirable to seed the orchard site to a soil-building crop such as hairy vetch, sweet clover or a summer legume during the season before the trees are planted. This practice would provide an opportunity for applying lime and phosphate the legumes require before establishing the orchard.

#### PLANTING THE TREES

In Oklahoma trees may be set in the fall, winter, or early spring. Except during dry seasons and in high, wind-exposed areas, fall setting is preferable. It occasionally happens that a dry fall prevails, in which instance it would not be advisable to set trees. This is particularly true in the central and western parts of the state.

Where trees are transplanted in the fall, new roots develop earlier, the soil has time to settle, and growth begins earlier in the spring. Tree roots make some growth during the warm periods which are characteristic of Oklahoma winters. A complete variety list of trees, as well as better quality trees, can usually be procured more readily in the fall than in the spring.

Do not leave trees in the shipping bundle. Open them and untie the large bundles, leaving the same varieties tied together. Dig a trench and "heel" them in; that is, bury the roots and firm the soil well about them. In case the soil is dry, water after a layer of soil has been placed over the roots. Permit the water to soak in, and then finish filling the trench. In order to protect the trees from the wind and direct rays of the afternoon sun, they should be placed in a sloping position, the tops pointing toward the southwest. Protect heeled in trees from rabbits by covering them with hardware cloth or inch-mesh poultry wire.

In planting, lay off rows and mark the place for each tree with a stake or shovel. Where furrows are laid out, holes can be easily enlarged with a shovel. Make the holes large and deep enough to accommodate the trees without cramping the roots. A good rule to follow is to set trees about one inch deeper than they grew in the nursery row. Do not expose the roots to the sun or wind. This may be avoided by wrapping their roots in moist sacks or hauling them to the orchard with their roots in a tub or barrel of water. In setting trees in Oklahoma, especially in the windier sections, it is advisable to lean the trees slightly to the southwest and to turn a low side branch in that direction.

Cut off all broken or badly bruised roots, place the tree in the hole, and cover the roots with well pulverized topsoil. A limited amount of well pulverized, rotted manure may be thoroughly mixed with the soil and placed around the tree roots. Fresh manure should not be mixed with the soil which is placed among the roots of the trees. Where fresh manure is used, apply it to the surface soil after the trees are set and gradually work it into the soil. Pack the soil firmly around the roots and add and pack a second layer. Water if the soil is dry, and fill the hole after the water has settled. Firm the soil well but leave two or three inches of loose soil on top as a mulch. The next job is to cut the top of the trees back to a bud facing into the southwest. Peaches and plums are cut back to 18 to 24 inches, apples and pears to 30 to 40 inches. (See section on pruning.)

#### CULTURAL PRACTICES

*Cultivation*—Trees require cultivation just the same as other farm crops. Cultivated row crops, such as potatoes, may grow between the rows of the young trees. As trees increase in size, however, fewer rows should be grown until the entire space is left to trees. A soil mulch, established with whatever practical tool is available, should be maintained about young

trees from early summer until the last of July during the average season. During a dry year, continue cultivation into August. Do not cultivate in such a way to allow the soil to ridge up at the tree row. A cultivation cover crop system that has been practiced successfully is seeding hairy vetch in the fall and allowing it to remain on the land the next summer instead of plowing it under. Vetch will mature seed in May and die, leaving a mulch cover on the soil during the summer. Late in August or early in September, disc dry vetch vines into soil to reseed the cover crop for the next year. If a good stand of vetch is secured from the first planting, this system may be continued for three or four years before summer weeds and grass get bad and clean cultivation becomes necessary for a season or two to control them. Vetch should not be planted up under the trees because the vines often grow up into the trees. This is especially true in the case of peaches. A clean cultivated strip about the width of a disc on each side of the tree row is advisable.

*The orchard should never be cultivated more than four or five inches deep, and three inches is better.* It is a mistake to think that deep cultivation forces tree roots downward. Trees will grow roots in all of the soil that is open and porous enough for root growth, regardless of cultivation. Cultivate shallow, using a disc or spring tooth harrow. If plowing is necessary, never go deeper than five inches.

*Cover Crops*—Seed a winter legume cover crop the last of August or the first of September. The most popular winter legume cover crop for orchards is hairy vetch. If the soil is dry in the fall, excellent stands can usually be obtained by seeding the cover crop with a cotton or corn planter, opening a furrow deep enough to put the seed in moist soil. Plant in three-foot rows, then double back, splitting the rows in half. This seeds the cover crop in 18-inch rows. Ten to fifteen pounds of seed per acre is sufficient for a good stand when this method of seeding is followed. In most soils, vetch is greatly benefitted by applying phosphate fertilizer—either superphosphate or rock phosphate—at the rate of 100 to 150 pounds per acre. With a fertilizer attachment on the planter it may be applied when the seed is planted. If there is a phosphorus deficiency in the soil, vetch may not survive the winter.

Rye or wheat may also be used as winter cover crops either alone or mixed with vetch. It is not advisable to use these mixtures if conditions are favorable for the growth of vetch, however.

In the absence of special tools for planting, the winter cover crop may be seeded broadcast. This method of planting

is wasteful of seed, and good stands are difficult to secure. If the seed must be planted by broadcasting, the following quantities should be used per acre; vetch alone, 30 pounds; rye or wheat alone, 100 pounds; mixture of vetch and rye—vetch 20, rye 30 or 35 pounds. The first time a field is planted to vetch, the seed should be inoculated.

*Organic Matter*—Organic content of orchard soils should be maintained at a high level. It improves the water-holding capacity of soil, prevents wind and water erosion and also supplies some plant food elements. Barnyard manure is one of the best sources of organic matter for fruit trees because it not only adds organic matter but also contains about 10 pounds of nitrogen per ton. It should be applied at the rate of about 300 pounds per mature tree. The material should be spread in the winter or early spring under the branches of the trees, but not closer than four feet to the trunk.

*Fertilizers*—Fruit trees, with the exception of pears, often need applications of fertilizers high in nitrogen. The nitrogen can be supplied as barnyard manure, legume cover crops, or nitrogen fertilizers. There is little evidence that phosphate or a complete fertilizer is of much benefit except in improving the soil for the production of winter legume cover crops.

Nitrate of soda, sulfate of ammonia and ammonium nitrate are common nitrogen fertilizers used around fruit trees. They contain nitrogen in a very soluble form and must be applied when the trees can take up the nitrogen they supply or some loss will occur by leaching. Use one-fourth pound of nitrate of soda or sulfate of ammonia for each year of the tree's age about three weeks before the blooming date, for best results. If ammonium nitrate is used, cut the application one-half. If the orchard is handled in sod, use twice the normal amount of fertilizer. Trees with light colored foliage growing on poor soil or those recovering from disease or insect attacks as well as those making only weak short annual growth respond well to applications of nitrogen fertilizer. Sow the nitrogen in a wide band, starting near the trunk of the tree and extending just beyond the spread of the branches.

Since the peach fruit set is often very light, the practice of making a split application of nitrogen fertilizer is sometimes followed. In this case one-half of the nitrogen is applied before blooming and the balance applied after a good fruit set is in evidence.

Pear trees should not be fertilized because any rapid succulent growth produced is more susceptible to the disease pear blight.

The use of nitrogen fertilizer increases the leaf area of the tree. Therefore, the water requirement of the tree is increased. In orchards where the trees are normally affected by summer drouths, fertilizer should be used with caution.

*Sod Culture*—In eastern Oklahoma where the annual rainfall is 40 inches or more, sod culture has been used successfully. This practice with the use of lespedeza to form the sod in orchards of matured trees appears satisfactory. More information is needed before too much can be said about sod culture, however, apples and pears appear to be better adapted to sod culture than peaches and plums.

#### PRUNING TREE FRUITS

Pruning is equally as important as cultivation and pest control. To prune properly the fruit producer must have a definite plan in mind. This applies whether the trees are young or old and regardless of the kind of fruit. Pruning itself retards the growth of trees and delays fruiting. Pruning is necessary, however, for two reasons. First, to develop a strong tree with a framework of branches capable of bearing heavy crops of fruit over a long period of years. Second, to maintain bearing age trees in a healthy growing condition so that they will produce annual crops of high quality fruit. Good annual growth is required for satisfactory fruit yields. *Prune only enough to accomplish the specific purpose for which the pruning is undertaken.* Pruning at no time means butchering, and overpruning is much more serious than underpruning. Prune regularly and wisely with a definite objective in mind. When tree fruits are first planted a general pruning and training plan should be adopted and followed throughout their life.

Prune during the dormant season any time after the leaves have fallen, up until growth starts in the spring. Peach trees are an exception. It is often desirable to prune peach trees to thin the crop after fruit is set. Especially is this true during years when they escape late spring frost damage, and to head them back to develop a low tree during years when the crop is entirely destroyed by a late spring frost. It is desirable to prune before the dormant spray is applied. This makes the months of December and January the main pruning months in Oklahoma, with February the month for finishing the job.

Wounds made by pruning do not usually need to be painted. In fact, most materials used for this purpose are harmful rather than beneficial. If large branches are removed leaving cuts 3 inches or more in diameter, it is helpful to paint them. Use a regular tree paint, such as emulsified asphalt or common shellac. The best procedure, however, is to handle the pruning

job in such a way as to avoid having to cut large branches, and to make clean smooth cuts flush with the trunk or branch. These smooth clean cuts will heal quickly without protection. Make cut sloping and never leave stubs.

Three tools are needed to do the pruning job. (1) A good pair of lopping shears with 24 to 30 inch handles preferably wooden. (2) A good pruning saw preferably one with a swivel blade that can be turned to saw at different angles. (3) A pair of small hand shears. Many workers like to use a small saw with a curved blade that saws toward the handle and as the trees get larger a 6 to 8 foot pole pruner of some sort. However, 90 percent of the pruning job can be done with a good pair of lopping shears. Keep tools sharp. Be sure the saw is sharpened with enough "set" in it to cut green wood.

*Types of Trees*—Tree fruits usually are developed into either an "open center" or modified leader type tree. In the open center tree the trunk is divided into from three to five major branches at from 18 to 36 inches of the ground. These three to five scaffold branches become the framework upon which the fruit bearing wood is developed. As the tree grows each scaffold is handled as an individual and is developed as a modified leader. From a distance an open center type tree looks a great deal like a round bottom bushel basket setting on a stump. Its fruit can, as a general rule, be harvested from the ground. Peaches are usually trained to open center type trees. If developed and maintained properly, a tree of this type will always be low.

A modified leader type tree is one having from 6 to 12 major branches spaced up and down and around a main trunk, the height depending on the spacing of branches. These scaffold branches should be from 8 to 12 inches apart with the first one around three feet from the ground. Because of the wind it is best to face the lowest scaffold branch into the southwest. To develop such a tree permanent scaffold branches are selected as the tree grows and all other branches are headed back or removed entirely. To develop a strong tree it is best to carry excess branches as temporary as long as they do not crowd permanent ones. As soon as main scaffolds need the space temporary branches should be removed entirely. All tree fruits may be trained into modified leader type trees. Apples, pears, plums, and cherries are especially adapted to this type of pruning. From a distance the modified leader type tree looks like an egg with its large end resting on a stump.

To prune wisely, the orchardist must understand how fruit trees bear, that is, know in general the age wood on which fruit is borne. Tree fruits adapted in Oklahoma divide themselves



into two general classes—those that *bear fruit on one year wood* and those that *bear on two year or older wood*. Peaches and a few plums fall in the first group, while apples, pears, and plums fall in the second. Sour cherries are produced on both one and two year wood. Fruit buds are always developed the season before the fruit is borne. Thus, buds for the crop a year hence are actually developed while the tree is maturing a crop of fruit already on its branches. In the case of peaches the fruit buds are laid down on the wood of the current season's growth. In the case of the other tree fruits mentioned, buds are developed mostly on fruit spurs that arise only from two year wood or older. These spurs are knotty rough looking

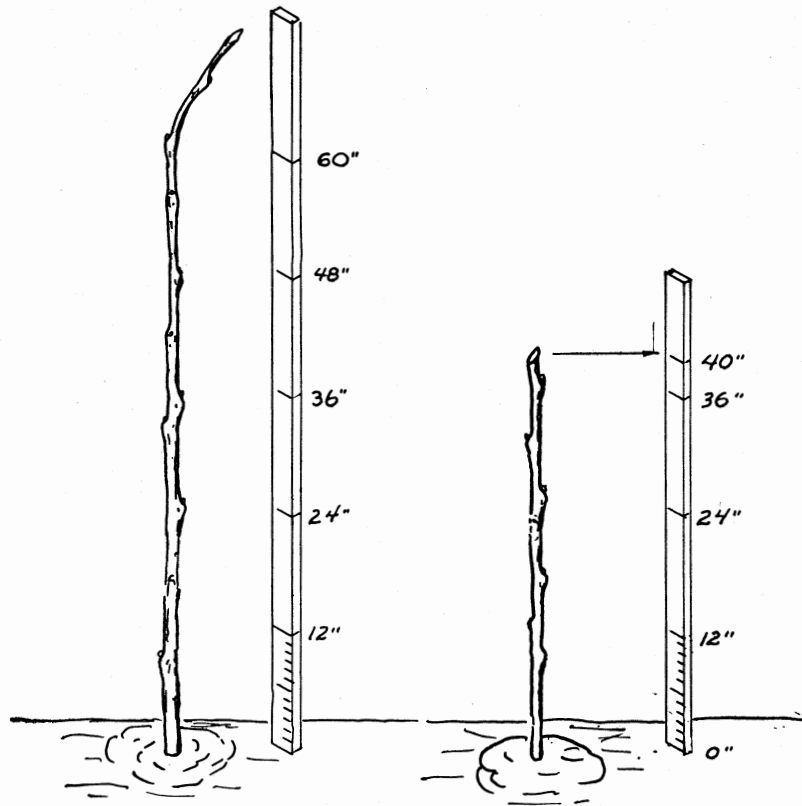
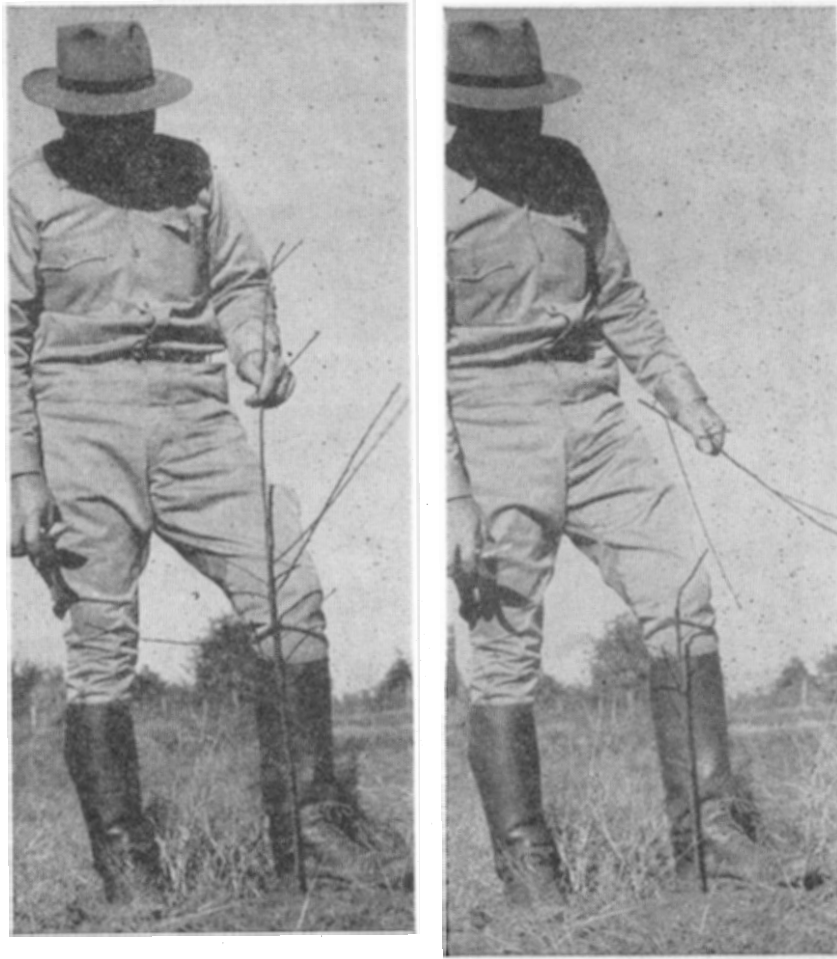


Fig 2.—Apple whip before and after heading back.

twigs, and are very noticeable in old apple, pear and cherry trees. Prune to encourage development of an abundant supply of fruit bearing wood on a strong framework of healthy branches.

*The Pruning Program*—Pruning starts at transplanting time and is an annual job thereafter. As soon as the tree is **planted prune it back to start it properly.** One-year-old peach trees should be cut back to a height of from 18 to 30 inches



**Fig. 3.—Branched peach tree before and after pruning.**

to force branching near the ground. If the tree has side branches, leave a heavy one toward the southwest and head back to half their length all branches except those selected as permanent scaffolds. If any of these are larger than the others, head them back enough to balance the tree. In cutting back side branches always cut to a healthy bud and at an angle. In the case of one-year-old apple or pear trees without side branches, head them back to a strong bud facing into the southwest at a height of from 30 to 40 inches above the ground. This will cause the development of side branches from which permanent scaffolds are selected. It is well to always force the top bud on the leader into the wind and those on lateral branches toward the outside of the tree.

In the case of branched trees, head them enough to cause the development of laterals on the main stem. Height at which they should be headed will be determined by side branches already present which are spaced right for permanent scaffolds. This procedure applies to all fruits to be developed into modified leader type trees, especially plums and cherries. Never remove a branch if it is growing where it is needed. Head it back if it is growing out of proportion to the others, but do not remove it.

During the years trees are growing the selection of permanent branches and their development is the main objective of all pruning. Proper spacing and the angle between trunk and branch are important things to consider in selecting scaffold branches. No branch directly above another should be selected for a permanent scaffold. Select and encourage development of scaffolds in a sort of loose spiral around the tree trunk. Pick those that come out nearly straight from the trunk, forming a wide angle. Such branches are much stronger than those forming narrow crotches. Permanent branches of apples and pears should be from 8 to 12 inches apart up and down the trunk.



**Fig. 4.—This matured apple tree was destroyed because of narrow angles between the branches and the trunk. Branches located too close together also weakened the tree.**

Those of other fruits will be closer together due to growth habits, but the same characteristics should be considered in their selection. Select as many permanent branches as possible each season. Head back all others as temporary and prune those selected just enough to balance them with each other. Temporary branches should be headed back to about half the length of permanent ones. It is desirable to keep all permanent branches, selected the same year, at about the same length. Thus, the shorter branch selected determines the approximate length of others.

During some years while trees are growing very little pruning will be necessary. Never prune unless there is a definite reason for removing or cutting back a branch. Leave the small leaf bearing twigs on trees. Leaves are the food manufacturing plant. Thus, small branches up and down the trunk and main branches inside the trees are an asset and should be left alone so long as they don't interfere with the development of the permanent branches.

Select new scaffold branches each succeeding year as the tree grows, and shorten back surplus laterals to carry them as temporary. Scaffolds selected the year before will have lengthened and produced laterals of their own. Laterals immediately on top of these branches should be removed, but the others should be kept. Don't cut back any of the scaffold branches unless they are excessively long or are outgrowing the lead



Fig. 5.—Three year peach before and after pruning.

er. Prune only enough to maintain balance. There will usually be several branches near where the leader was headed back. Select the strongest of these for the leader and remove or head back others. When two branches near each other start to develop at the same rate, one of them should be headed back to prevent formation of a bad crotch.

As trees grow higher year by year, select new scaffolds and follow the general plan as suggested until the desired number of scaffolds have been secured. For modified leader type apple and pear trees this will be 8 to 12, and for peaches, plums and cherries 6 to 8. For open center peaches the number will be 3 to 5. The right number having been selected, the leader or topmost portion of the trunk should be removed.

Growth is thus diverted outward into the topmost scaffold branch.

During years trees are making their growth, branches may appear to be thick and crowded. Upward growth of the branches produces this effect. Fruit production will change the shape of the young tree as the weight of the fruit will pull the branches downward. If excessive thinning is done previous to the time trees start bearing fruit, trees to appear thick before and at the time they come into heavy fruit production. *This is the period when very little pruning will be required.*

As the top is spread due to the weight of succeeding crops, lower branches become crowded and the new



Fig. 6.—Pruned three year old apple tree.



Fig. 7.—Three year old pear tree. Note how pruning was done to an outside bud.

growth gradually loses vigor and quality. A gradual resumption of pruning now becomes necessary. Thin, spindly and unthrifty growth should be removed. If branches crowd each other and room for the proper development of laterals is not available some of the surplus larger branches may be removed. If branches starting from a low point upon the trunk are weighted down to the ground such branches should be removed. But the trunk of the tree should never be exposed to the sun by the removal of lower branches. Shade produced by low branches is the best insurance against sunscald and borer damage to the trunk of the trees. This is especially true of apples, pears, cherries and plums.

Old apple trees will need to have the thin wood growth removed from the inside of the tree each year. Branches falling in this category are those long ones arising inside the tree and extending outward usually resting on the main scaffold branches. They will usually range from a half to an inch and a half in diameter and will have but a few side branches. They branch at the end in the outer canopy of the tree making it thick. Thus, by removing them the outer third of the tree is opened up to some extent and sturdy lateral growth on the main scaffold branches is encouraged. Removal of thin wood from the interior of old apple trees is 90 percent of the pruning job in old properly developed trees.

Pruning of pears in Oklahoma is a problem due to the bacterial disease "fire blight." As a rule it is desirable to start

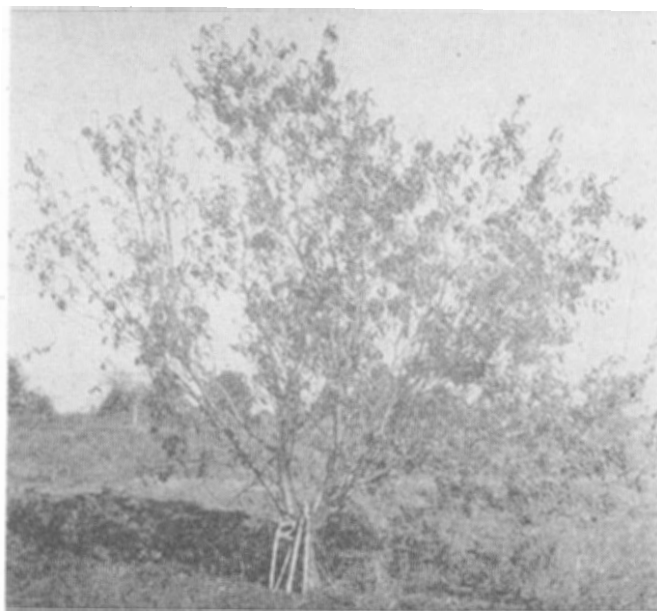


Fig. 8.—Normal pruning mature peach tree.

them as suggested for apples, pruning as little as possible until the trees reach four to six years of age. Then stop pruning altogether except from the removal of broken branches. If fire blight disease gets bad at any time stop pruning altogether and also turn pears to sod. Slow, tough growth is the only way yet discovered to get along with fire blight in pears.

Cherry and plum trees will always look thick because of the type of fruiting wood they develop. After they reach bearing age, very little pruning will be required except the removal of branches that are interfering with each other. The more carefully the tree is developed from the time it is planted until it comes into fruiting the less it will need to be pruned after it starts bearing.

Peach trees require more severe pruning than other tree fruits because of their fruiting habit. Annual growth should measure around 14 inches, and this means removing, by thinning back the laterals on the main scaffold branches, about a third of the top each year. In the case of neglected peach trees, it is often necessary to dehorn them to bring the trees back in bounds. This can be done either during the dormant period, if the chances of a fruit crop are to be skipped, or in the spring after a late frost has killed the fruit crop.



**Fig. 9a.**—Peach tree before pruning.

Late spring or delayed pruning of peaches is also a desirable practice in Oklahoma because of late spring frosts. In following this type of program the trees are pruned very little during the dormant season. Just the broken branches and those interfering with the main scaffolds are removed. The main thinning back pruning is not done until after danger of frost is past in the spring and a crop of fruit is or isn't on the tree—as the case may be. If a heavy crop of fruit has been set, it is thinned with the pruning shears, and the tree's branches are cut back to encourage the development of new growth nearer the center of the tree. The same type of thinning back pruning is done as suggested for the dormant season. The difference being that the tree is in full leaf.

If only a light crop of fruit has been left on the tree due to a late frost, no pruning is done in order to salvage all the fruit. If no fruit is left, the tree is pruned severely to shape it as desired. In such cases trees may be dehorned if they are getting out of hand.



**Fig 9b.—Same as Fig. 9a after pruning.**