

# *Orchard Management*



TEXAS AGRICULTURAL EXTENSION SERVICE  
G. G. Gibson, Director, College Station, Texas

This bulletin was prepared in the hope that fruit growers may find in it information that will help them produce more fruit and fruit of high quality. Representatives of the Texas Agricultural Experiment Station, nurserymen and outstanding fruit growers were consulted in the preparation of the publication and many suggestions made by them have been included.

Texas has such a wide range of soil and climate that some recommendations for pruning and fertilizing of fruit trees must be modified to suit local conditions.

For a detailed list of recommendations for fruit varieties for the various parts of the state, see the Texas A. & M. College Extension Service Publication, C-150, "Fruit Varieties for Texas."

### References

- FB-1001 Growing Fruit for Home Use.
- FB-1588 Frost and the Prevention of Frost Damage.
- FB-1870 Pruning Hardy Fruit Plants.
- FB-1026 Strawberry Culture; South Atlantic and Gulf Coastal Region.
- FB-1399 Blackberry Growing.

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Texas A. and M. College System

**O**NE-HALF to one acre planted to a variety of fruits chosen to ripen in succession will supply a family of five with fresh fruits in season and a surplus to can, dry, preserve and pickle for the winter. It costs only a few dollars to prove that you can produce fruit on a small scale, at least. One must, of course, have some land, either his own or a willing landlord's. With this as a start, and with a willingness to spend a few odd hours during the year attending the trees and plants, almost any Texas farmer or farm wife may have home-grown fruit in abundance, a quantity that will provide each family member the two servings daily or 300 pounds yearly needed for good nutrition.

Fruits help to make the diet satisfactory by supplying iron and calcium and other minerals for blood and bone and body processes. Some fruits supply Vitamin A, which helps maintain a healthy condition of the eye and of the thin layer of skin covering all the internal parts of the body. They give Vitamin B, which makes for normal, steady nerves, and helps the body efficiently use the energy secured from starches and sugars. They give Vitamin C, necessary for good strong blood vessel walls and normal growth and maintenance of bones and teeth.

Fruits are a pleasing addition to the food supply. Because of their fine color, texture, aroma, and flavor, they lend themselves to being served in a variety of ways from cocktail to dessert.

## **Choose Your Location Carefully**

Some spots on the farm are better than others for growing fruit. If possible the orchard should be located within easy reach of the house, and laid out so as to add attractiveness to the home grounds. In areas of heavy rainfall, the orchard should be located on a hillside to provide good drainage. In areas of limited rainfall, the orchard should be planted where it will "catch" water. Livestock quickly ruin trees, which suggests that some places should be avoided as orchard sites, and most places fenced.

Select healthy soil and avoid old orchard sites, because serious diseases may often be found in stumps of old trees. During the growing season prior to setting the orchard, pull up and examine the roots of plants growing where the trees are to be planted. If bead-like knots are found

on the roots, it will indicate the presence of nematode (a tiny worm) in the soil. When nematodes are found in soils, do not plant fruit trees there, as most of the trees will be killed by this pest. Avoid planting the orchard where cotton dies. This disease (root rot) attacks most fruit trees.

### **Look for a Light Soil**

Fruit trees will grow in many types of soil, but if it can be found, a deep sandy loam is the choice. Heavy soils bake, crack, and become very dry, while loose soils of reasonable fertility hold moisture more uniformly throughout the season to promote root, top and fruit development. Heavy soils may be improved by plowing under a green manure crop of some sort, even of weeds, and by spreading manure before the trees are set. This treatment should be repeated every two or three years during the life of the trees.

### **Buy From Reliable Nurserymen**

The first consideration in buying a tree is to get a vigorous one. The second is to get one grafted onto the right kind of root stock. The cheapest and most profitable trees in the long run are those of medium to large size, thrifty and free from disease, when planted. Runty or weak trees are expensive at any price. No better general suggestion for buying fruit stock can be given than to get it from a recognized, reliable nurseryman.

### **Select Varieties Adapted in Your Locality**

In selecting kinds and varieties of fruit for the home orchard, consider varieties adapted to local conditions of soil and climate, preference of different members of the family and a succession of ripening fruits. So wide is the range of climate and soil in Texas that the choice of the proper kind of plant is an important factor of success.

Extension Service Circular No. C-150, "Fruit Varieties for Texas," gives detailed information on the kinds and varieties of fruit to plant in the different parts of the state.

### **Treat Trees Carefully On Arrival**

It is preferable to plant trees during January and February. Trees should be unpacked immediately upon receipt from the nurseryman. Every precaution should be exercised to prevent the roots from becoming dry. If the trees cannot be planted at once, they should be "heeled in" by digging a trench sufficiently wide and deep to receive the roots. In covering the roots with soil, care should be taken to work the soil into the spaces where the roots are massed together; otherwise there is danger of drying out, even though the tops of the roots are apparently well covered. If the soil is dry, a few pails of water poured into the trench may prevent the roots from drying out. Occasionally the trees may be frozen in transit. Upon arrival such trees should be completely buried (tops and roots) in moist soil so that they may thaw slowly. Avoid wet spots where the soil is poorly drained as a site for heeling in trees.



## Plow Soil Deep Before Planting

The soil where the trees are to be planted must be thoroughly prepared, even though the planting be delayed in order to do so. Deep plowing is advocated, and should be done in the fall or early winter, at which time a cover crop such as vetch, clover, rye or oats may be sown. The hole should be wide and deep enough to accommodate the entire root system of the tree easily. Broken or torn roots should be removed before the tree is set in the hole. Plant the tree at the same depth that it was in the nursery. In filling in the hole, spread the roots of the tree normally and pack the soil firmly around it.

## Let Soil, Rainfall and Slope Determine the Planting Plan

In laying out even a small orchard, spacing between the trees should be decided carefully. Where terraces are needed, they should be prepared some time before the trees are planted to allow the soil to settle. A terrace for each tree row is a sure way to avoid loss of moisture and plant food. Trees planted on top of terraces do especially well. If the trees are not to be planted on terraces, the rows should follow the contour of the terraces.

In areas where the topography of the land is level, the trees may well be planted by the square method. Where the trees are planted in squares, cross cultivation may be employed, thereby making the task of cultivating the orchard much easier.

Suitable planting distances and the number of trees or plants that may be planted per acre by square or triangular methods according to planting distances are shown in the accompanying table.

## Give Plants Enough Room

|              |                     |
|--------------|---------------------|
| Apples       | 30 to 40 feet apart |
| Pears        | 30 to 40 feet apart |
| Pecans       | 40 to 60 feet apart |
| Peaches      | 25 to 30 feet apart |
| Plums        | 20 to 25 feet apart |
| Cherries     | 20 to 25 feet apart |
| Cherry-Plums | 20 to 25 feet apart |
| Figs         | 20 to 25 feet apart |
| Grapes       | 12 to 16 feet apart |

### Berries:

|              |   |
|--------------|---|
| Blackberries | Plants 3 feet apart in row<br>Rows 6 feet apart     |
| Dewberries   | Plants 4 feet apart in row<br>Rows 6 feet apart     |
| Strawberries | Plants 10 inches apart in row<br>Rows 2½ feet apart |

## Number of Plants Per Acre

| Distance Apart<br>(No. Feet) | Square Method<br>(No. Trees) | Triangular Method<br>(No. Trees) |
|------------------------------|------------------------------|----------------------------------|
| 10x10                        | 435                          | 500                              |
| 15x15                        | 194                          | 223                              |
| 20x20                        | 108                          | 124                              |
| 25x25                        | 69                           | 79                               |
| 30x30                        | 48                           | 55                               |
| 35x35                        | 35                           | 40                               |
| 40x40                        | 27                           | 31                               |
| 60x60                        | 12                           | 13                               |

## Cut Back Trees at Time of Planting

Trees should be cut back at the time they are planted to more nearly maintain a balance between the roots and tops. Cutting back should be done to the height at which the permanent branches are expected to develop. (Exceptions to this rule are pecans, figs, citrus and grapes.) Small trees 12 to 14 inches in height do not need to be pruned when planted. Medium to large trees should be pruned at planting time as follows:

Apples—cut back to 30 inches.

Cherries—cut back to 18 to 26 inches.

Citrus—(bare root trees) cut back to 26 to 30 inches.

Figs—cut back to one-third to one-half of top.

Grapes—cut off all except one branch leaving two to three buds.

Peaches—cut back to 18 to 20 inches.

Pears—cut back to 30 inches.

Pecans—cut back one-third of top of tree.

Plums—cut back to 18 to 20 inches.

## Prevent Rat and Rabbit Damage

Damage to fruit trees from rabbits gnawing on the trunks has long been a problem to orchard owners. The damage is not only disfiguring to the appearance of trees, but is also detrimental to their growth and development, and sometimes causes total loss of a newly set orchard.

Young fruit trees that have just been set out in the orchard may be wrapped with several thickness of newspaper or wrapping paper around the slender trunks. This protective covering of paper prevents the rabbits from gnawing on the tender bark and damaging the trees. On larger fruit trees the trunk and lower branches may be treated with a repellent solution to prevent rabbit damage. This formula has been used successfully by orchard owners.

2 lbs. sulphur

2 lbs. yellow ochre

$\frac{1}{4}$  pint turpentine

$\frac{1}{4}$  pint linseed oil

1 oz. asafetida

4 eggs

$\frac{1}{2}$  pint wheat flour

Mix with skim milk and apply with paint brush.

## **Fertilize Your Fruit Trees**

In planting it is well to add a shovelful of rotted manure to each three shovels of soil and fill in around the roots. If commercial fertilizer is used on first year trees, it is better to wait until the trees have begun growth before fertilizer is applied. In using commercial fertilizer to stimulate growth in one-year trees three-fourths to one pound per tree of 5-10-5 commercial mixture may be worked into the soil within a radius of 18 inches from the body. For second and third year trees, one to two pounds per tree of 5-10-5 mixture should be applied within the shade line of the trees at the time the buds begin to swell. A side dressing of one-half to one pound per tree of a quickly available nitrogenous fertilizer, such as nitrate of soda or ammonium sulphate, applied May 1st to 15th can usually be relied upon to stimulate additional growth.

In areas of sandy soil and ample rainfall commercial fertilizer may be used to stimulate tree growth and fruit development. This may be applied at the beginning of the growing season at the rate of one to two pounds per inch in diameter of the trunk of the tree. It should be applied toward the end of the branches instead of close to the trunk of the tree. Where a winter cover crop is to be turned under, the commercial fertilizer may be applied just ahead of the plow and both turned at the same time.

## **Increased Production With Cover Crops**

When fruit crops come into production, the demand and need for plant food is greatly increased. Winter cover crops such as hairy vetch, clover, rye or oats will aid in maintaining soil fertility and prevent winter erosion. Winter cover crops should be planted in the early fall and turned under in the early spring at blossoming time.

Hairy vetch should be planted only in areas of adequate rainfall, seeding at the rate of 15 to 20 pounds per acre. Clover may be planted in the early fall at the rate of 20 to 25 pounds of seed per acre. Clover thrives best in the heavy soils of South and South Central Texas. Rye, oats and wheat are more tolerant of drouth and therefore are recommended for the western part of the state. One and one-half to two bushels per acre is the proper planting rate. In the sandy soils of East Texas, hairy vetch or Giant Bur clover are recommended.

## **Intercrop With Care**

In no instance should the crop planted between the tree rows be closer than four to six feet to the young trees. Planting close to the tree row brings the feeding area of the young trees into competition for plant food with the intercrop growth. Besides there is danger of injuring the tree in cultivation.

Intercropping has its advantages in that an income is realized from the land in return for the necessary expenditure of time and labor given to the young trees. Intercrops should be planted early to mature before dry weather begins. Early planted field peas are commonly used. The

Brabham or Iron varieties are best because they are resistant to nematode, thereby eliminating the danger of infesting the orchard soil with this pest. Corn or grain sorghums are not desirable because they grow to such a height that they often shade the young trees. Vine crops, such as cucumbers and cantaloupes, soon cover the ground and prevent further cultivation when it is most needed.

## Protect Your Trees With Windbreaks

In those areas where winds damage soil or trees, windbreaks should be planted for protection. Windbreak trees should not be planted closer than seventy-five feet to the fruit trees to avoid competition.

## Summer Cultivation Is Essential

Cultivation is essential, not only during the spring and early summer, but throughout the entire period the foliage is on the trees. Probably the most critical period of cultivation comes during July, August and early September when the evaporation of moisture is most rapid. If thorough cultivation is not carried on at this season, the soil will bake and crust over and weeds will take moisture that should go to the trees. It is not advisable to plow deep in an orchard with a turning plow during the growing season. A disc, spring-tooth or spike-tooth harrow are desirable implements for preparing and cultivating orchard soil. Do not plow dirt to the tree rows. This practice covers the roots too deep and may cause the tree to exude gum on the body.

## Prune to Train and Maintain Trees

The pruning that a tree receives at the time of planting and during the next two or three years thereafter has much to do with its future. Pruning is done to maintain a perfectly balanced tree that is easy to spray and from which fruit may be easily picked, and pruning is employed to stimulate new growth. Except in the case of one, two and three year trees, pruning should generally be done during the dormant season. When a branch appears at the wrong place, it is well to take it off at once, even though it be in the growing season. May or early June is a good time for doing this work.



Fig. 1. A peach tree needs pruning at the end of the first growing season. Select alternating branches, removing the second branch on the left and the third branch on the right trunk.



## Prune to Shape Head

In the young orchard the selection and training of branches for forming the head is a matter of importance. The heads of first year trees should be developed with three to five branches. The first of these branches should be eight to ten inches above the ground with the others alternating four to six inches apart to the top. (See Fig. 1.)

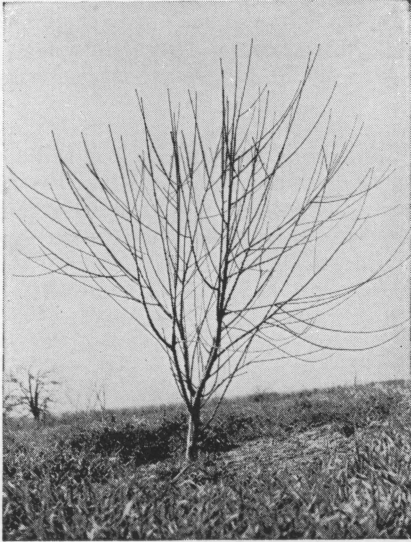


Fig. 2. A two-year-old peach tree before pruning. Approximately one-third of the current season's growth should be pruned each fall.

too long and out of proportion to the other branches on the tree. (See Figs. 2 and 3.)

## Pruning Peaches and Plums

It is essential that some pruning be done each year. Young bearing trees should make at least ten inches of growth annually, for where the growth is limited to a few inches there is usually a diminished number of fruit buds. A general rule for pruning bearing trees is to remove approximately one-third of the current season's growth each fall.

At the end of the first growing season prune off those branches on the body that are not to become part of the permanent framework of the tree. The ends of the remaining branches should be pruned so that all will be of approximately the same length. Do not remove more of the "end growth" of the trees than is necessary to give the tree a symmetrical appearance.

Second and third year pruning does not vary widely from the first year, except perhaps in the extent of pruning. The cutting back done at this time requires that particular attention be given to thinning out lateral branches that are too close and shortening branches that have grown

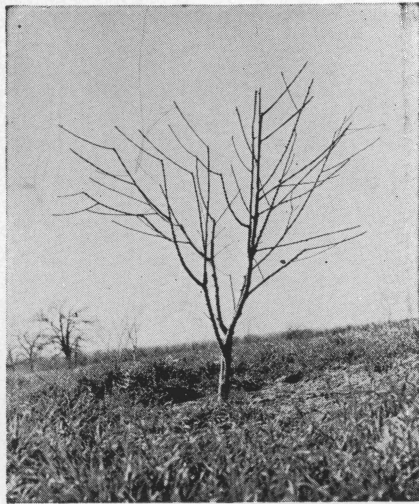


Fig. 3. The same two-year-old peach tree after pruning.

## Pruning Apples and Pears

In pruning apple trees we do not aim toward an open center. In unpruned trees the central limb is apt to run up 15 to 18 feet. Therefore during the second or third growing season it is best to cut the central leader branch to a height of 10 to 12 feet in order that the side branches may develop in proportion to the central leader, thus making a better balanced and more symmetrical top. Shaping a tree in this way necessitates that some pruning be done each year to both the central leader and the side limbs, but the central limb should always be left a little longer than the side branches. Heavy pruning causes the fruit spurs to grow into leafy branches. Pruning old trees consists mainly in thinning out dense growth and removing rubbing limbs.

Young pear trees run up very tall and the branches are inclined to crowd each other. It is advisable to remove the limbs that cause the crowding during the first two or three pruning seasons. To encourage the spreading of the tree, cutting back should be done only where there are outside buds and shoots.

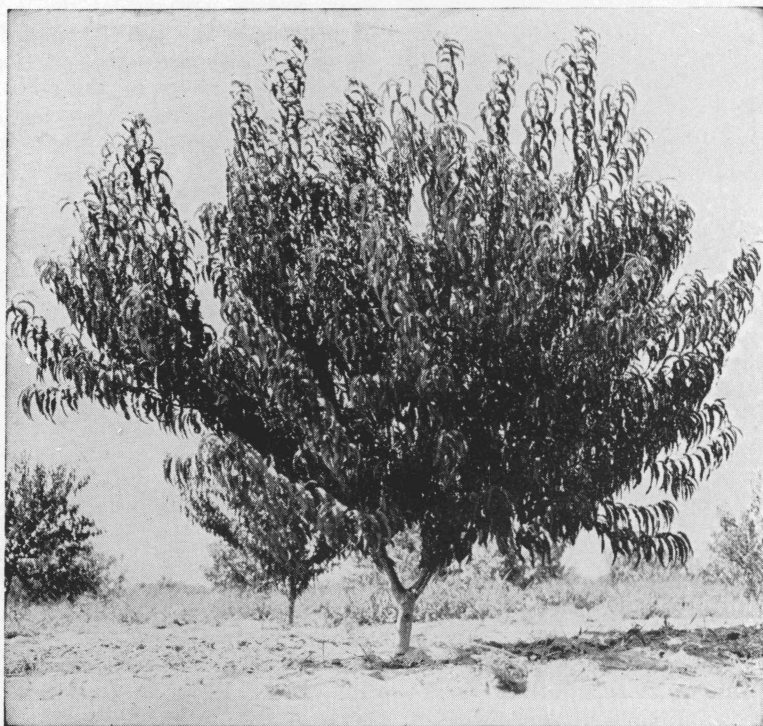


Fig. 4. The same peach tree as previously shown, but in its third growing season following the second winter pruning.

## Pruning Figs

If the grower wants a fig tree of the "tree form" (from a single trunk), the main stem should be cut back to a height of 12 to 18 inches. If a "bush form" is desired, the lower limbs should not be removed but cut back enough to be of uniform length. Very low heading tends to induce branches from below the ground and the development of sprouts from the roots. Magnolia figs should not be pruned as severely as formerly thought necessary. Removing one-third of the top is enough to encourage early and heavy fruit production. The Celeste and other varieties should be pruned even less than the Magnolia; one-fourth of the branch area may be removed. Upright and incurving limbs should be cut to keep the top fairly open.

## Pruning Grapes Is Highly Important

In constructing a four-cane Kniffin system trellis (suggested because it is the simplest), set posts well into the ground 12 to 16 feet apart. Tack a heavy wire to the post or run the wire through the post 40 inches from the ground. The second wire should be 60 inches from the ground. It is important that the post be well set into the ground and the wire stretched tightly to insure permanence.

After a grapevine is planted, cut it back to two or three buds on the most vigorous branch and remove all other branches. During the first growing season, select the best shoot and keep the others pinched off. The following winter the shoots should be tied to the top wire of the trellis. At the same time it should be cut off three to four inches above the height of the top wire. During the following summer, the strongest shoots should be selected from the growth and trained along the wires. Future pruning should be confined to cutting the vine back to four side branches three to five feet in length.

## Pruning Berries

Very little, if any, pruning should be given dewberry and blackberry plants the first year. The second growing season, after the crop has been harvested, cut out all the old growth leaving the new growth on which the crop will develop next spring. Do not allow more than three sprouts (canes) to grow in a hill. The berry planting should be transplanted to a new location every four or five years.

## Propagate Trees From Seed

Peach seed may be saved when the fruit is harvested and planted in the early fall. The seed should be kept in damp soil, sawdust or peat moss until there is sufficient moisture in the soil for planting. September or October are the best months for planting. In areas of limited winter moisture, it is advisable to keep the seed where they can be kept moist and planted in the nursery row in early February.

Peach seed of the Honey type should be planted in the southern part of the state, while in the northern part Lovel peach seed or native seedlings are more apt to germinate readily.

Peach seed should be planted two inches apart and covered two to three inches deep. With a favorable season the seed will come up and grow to a height of 18 to 24 inches by June or July at which time they may be budded from trees bearing fruit of proven quality. Information on budding may be obtained from Extension Service publication L-61, "Budding Peaches, Plums and Other Stone Fruits," and B-166 "Propagation of Pecans by Budding and Grafting."

CITRUS. No mention has been made of citrus management problems, as the handling of this type of fruit is discussed in B-192, "Planning The New Citrus Orchard in the Lower Rio Grande Valley." Inquiries on this subject may be directed to the Extension Service office, Rio Grande Valley Experiment Station, Weslaco, Texas.

### **Control of Insects and Diseases**

Secure Circular C-321, "Guide for Controlling Insects and Diseases on Fruits and Nuts" from your County Agent.