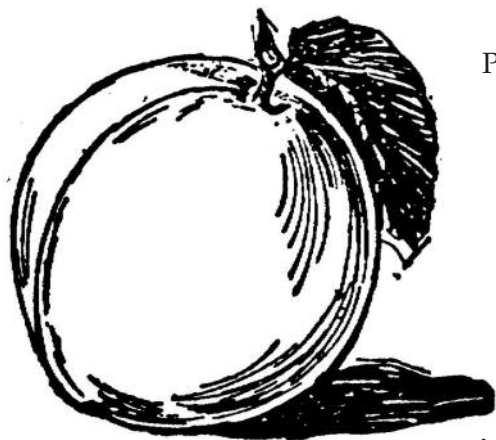


Fruit and Nut Review

Peaches, Nectarines, and Plums



Peaches, nectarines, and plums, all members of the *Prunus* genus, grow well throughout Mississippi if late spring frosts or freezes do not damage blooms or young fruit. Spring frosts or frosts during or after bloom are often the limiting factor for peach, nectarine, and plum production. Several factors affect the potential for spring freeze damage.

One important consideration is the chill hour requirements of different cultivars. In general, chill hours refer to the number of hours below 45 °F a plant is exposed to during the winter months. This exposure to cold temperatures is required for fruit trees to break dormancy. Average winter chilling hours for various Mississippi locations are Hattiesburg, 400 to 600; Jackson, 600 to 800; Mississippi State University, 800 to 1000; and Holly Springs, 1000 to 1200. A peach cultivar that requires 1000 chill hours to break dormancy probably will not grow very well in Hattiesburg because it will not get enough chill hours. On the other hand, a peach cultivar planted in

Holly Springs that requires 500 chill hours will have its chill hour requirement satisfied around Christmas and start blooming during the next warm spell in January. Blooming this early would risk the blooms dying in the next cold front.

Peach Cultivars

Cultivars recommended for Mississippi areas north of Hattiesburg.

| Variety | Chill Hours | Maturity Date |
|--------------|-------------|---------------|
| Springold | 850 | May 30 |
| Bicentennial | 700 | June 4 |
| Surecrop | 950 | June 10 |
| Sentinel | 850 | June 17 |
| Harvester | 700 | June 27 |
| Redhaven | 950 | June 29 |
| Contender | 1050 | July 4 |
| La Premier | 1050 | July 4 |
| Redglobe | 850 | July 15 |
| Ruston Red | 850 | July 20 |
| Cresthaven | 850 | July 24 |
| Redskin | 750 | July 25 |
| Ouachita | 850 | August 3 |
| La Jewel | 850 | August 8 |

Springold, Bicentennial, and Surecrop are clingstone; others listed are freestone. Elberta is a famous peach cultivar that was the most popular commercial cultivar in the eastern U.S. for many years. Elberta is still available from many nurseries but is no longer recommended because several superior cultivars ripen at the same time, July 20.



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Cultivars recommended for areas south of Hattiesburg.

| Variety | Chill Hours | Maturity Date |
|--------------|-------------|---------------|
| Florida King | 400 | May 18 |
| Bicentennial | 750 | May 26 |
| June Gold | 650 | May 30 |
| La Pecher | 450 | June 6 |
| Idlewild | 550 | June 9 |
| Harvester | 750 | June 15 |
| La White | 650 | June 18 |
| La Gold | 700 | June 19 |
| La Festival | 450 | June 25 |
| La Feliciana | 550 | July 5 |
| Dixiland | 750 | July 20 |

Florida King and Bicentennial are clingstone; June Gold, La Pecher, and Idlewild are semifreestone; other cultivars listed are freestone.

Nectarine Cultivars

Nectarines are a fuzzless genetic mutation of peaches. They are not the result of crossbreeding between peaches and plums. Based on yields in MAFES research orchards, **Harko**, **Redgold**, **Stark Sunglo**, and **Hardired** are recommended for northern Mississippi. **Karla Rose**, **Sunfre**, and **Carolina Red** are recommended for southern Mississippi.

Recommended nectarine cultivars.

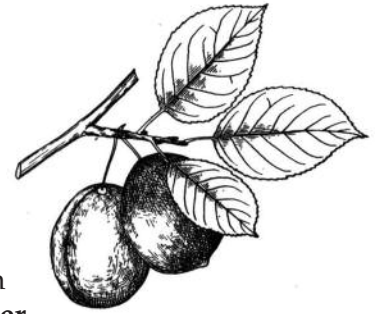
| Variety | Chill Hours | Maturity Date |
|--------------|-------------|---------------|
| Harko | 800 | July 1 |
| Redgold | 850 | July 10 |
| Sunglo | 850 | July 5 |
| Hardired | 850 | July 1 |
| Karla Rose | 650 | June 5 |
| Sunfre | 525 | June 5 |
| Carolina Red | 750 | June |

Plum Cultivars

Most varieties of plums require from 550 to 800 chill hours. This means that plums may bloom early in central and north Mississippi, making them susceptible to late frost injury.

Cultural requirements of plums are much like that of peaches. One main difference is that most plum varieties are not self-fruitful and require the presence of another variety for cross-pollination.

Methley, **Bruce**, and **Au-Amber** are self-fertile and can be used to pollinate most other plums.



Robusto, **Morris**, and **Methley** are recommended for northern Mississippi. **AU Producer** and **Methley** are recommended for southern Mississippi.

Robusto -- red skin; white flesh; high-quality fruit; susceptible to diseases

Morris -- red skin; red flesh; high-quality fruit

AU Producer -- dark red skin; red flesh; high-quality fruit

Au-Amber -- red-purple skin; yellow-amber flesh; small fruit; medium firmness; recommended for roadside, local markets, and home use; self-fruitful

Au-Cherry -- red skin; red flesh; small fruit; medium firmness; recommended for home production

Methley -- red-purple skin; high-quality fruit; used mainly to pollinate other varieties; susceptible to blackknot; self-fruitful

Bruce -- usually marketed as a "green" plum; reliable fruit production after late frost; self-fruitful

Planting and Training

Prunus trees will not tolerate poorly drained, wet soil. Excellent soil drainage is required. Commercial orchards are routinely planted on hillsides with deep, well-drained soils. The good air circulation found on hillsides helps prevent frost and control disease. The orchard should receive full sun and have good air and water drainage. Morning sun can help dry foliage early in the day and reduce disease pressure.

For the best orchard performance, purchase quality fruit trees from reputable nurseries. A 1-year-old tree with a 3/8 to 1/2 inch trunk diameter, 3 to 5 feet tall, with a good root system, will typically outperform a 2-year-old tree that is much larger at the time of purchase. Avoid nursery trees with small or malformed root systems. Cut the tree off 24 to 30 inches above the ground after planting to force new branches to develop into a well-shaped fruit tree.

Fruit trees are traditionally available as bare-root plants from nurseries in the spring. The trees are dug from field beds while dormant and held in cold storage until spring planting. The trees are shipped and planted before breaking dormancy. Containerized fruit trees are also available. They can be planted later in the spring after breaking dormancy. With proper care, either of these types of nursery trees will perform well in the orchard.

Planting in early spring rather than later in the summer gives the tree a chance to establish itself in the orchard before stressful summer weather begins. Dry roots lead to tree death, so keep the roots of nursery trees moist before planting. You can do this by storing the tree in a plastic bag to hold moisture or by "healing in" the tree in moist, well-drained soil. The key is to keep the roots moist but not soaking in water. If the tree cannot be planted immediately after purchase, store it in a cool place to keep it dormant until planting.

Peach, nectarine, and plum trees require an average of 15 to 20 feet of space on all sides to prevent overcrowding. A common spacing in commercial orchards is 20 feet between rows and 15 feet between trees. This spacing anticipates annual pruning to control tree size and spread. Prune damaged roots before planting.

The planting depth of fruit trees is an important consideration. Trees will die or grow poorly if planted too deeply. The correct planting depth for bare root trees is the depth at which they grew in the nursery. This can be determined by the change of bark color from the roots to the trunk. Before transplanting, check container trees to make sure the root-ball is not too deep in the container. It is common for container trees to be growing too deep in the container, and this will lead to problems once the tree is transplanted to the orchard. If necessary, remove some of the media from the top of the container tree root-ball to insure the correct planting depth. The uppermost root should not be more than 1 or 2 inches underground.

Dig the planting hole three times as wide as the root ball and just deep enough for the roots to be at the desired depth. Spread the roots evenly around the planting hole. Make sure that the root ball has complete soil-to-root contact with no air pockets, which could lead to desiccation of roots.

Use only the native soil as backfill in the planting hole: do not add amendments or fertilizer to the backfill.

Poorly drained soil and shallow soils should be avoided for peach, nectarine, and plum trees. Tree growth and life span will be unsatisfactory in this type of soil. If a hardpan exists in the orchard, break it before planting. Prunus trees respond well to raised beds, where soil drainage is enhanced.

Fertilization

Peach, nectarine, and plum trees grown in most Mississippi soils benefit from annual fertilizer applications. Soil tests every 2 years will indicate which nutrients need to be applied. Many Mississippi soils are acidic and benefit from lime applications. Follow soil test recommendations and apply lime as needed to maintain soil pH between 5.5 and 6.5. Balanced fertilizers such as 13-13-13 and 8-8-8 are commonly recommended for fertilizing fruit trees and do a very good job of supplying plant nutrients.

Phosphorus (P), the middle letter in NPK fertilizers such as 13-13-13, can build up to high levels in soils and may not need to be applied annually like nitrogen (N) and potassium (K) do. Too much soil P could be as harmful as too little. The soil test will provide this information. Nitrogen is commonly the limiting plant nutrient, and annual applications are usually needed for optimum plant growth and fruit production. A shortage of N can cause short shoot growth (less than 6 inches per year), pale green or yellow foliage, and small, well-colored fruit. Too much N can cause excessive shoot growth (more than 36 inches), deep green foliage, and late-maturing, poorly colored fruit. Excessive vegetative growth will shade fruitwood in the lower portion of the tree canopy and eventually will cause the fruitwood to die. In time, the surviving fruitwood will be in the upper reaches of the tree canopy, not distributed throughout the tree.

Research indicates that fruit trees benefit from a split application of fertilizer, especially N, annually. Apply half the recommended fertilizer in February before bud break, and apply the second half around mid-August. Spread the fertilizer evenly around the tree under the drip line of the branches.

Here are general guidelines to use for fertilizing peach, nectarine, and plum trees, but remember that soil conditions vary from site to site. Use soil test recommendations and personal observations of the growth and appearance of the fruit trees along with these recommendations as the basis for fertilizer applications. Excessive fertilization does not help the plant, the environment, or the budget.

First year -- Apply 1 pound of a complete fertilizer (e.g. 13-13-13) at bud break (early spring) in a circle starting 10 to 12 inches from the base of the tree. Apply 1/2 pound ammonium nitrate (33-0-0) 20 to 24 inches from the base of the tree in early June. Apply the fertilizer in a band approximately 12 inches wide. Place the fertilizer to encourage outward growth of roots.

Second year -- Apply 2 pounds of a complete fertilizer (13-13-13) in a circle under the drip line of the tree in early spring. Apply 1/2 pound ammonium nitrate (33-0-0) under the drip line of the tree in early June.

Third year -- Apply 4 pounds of a complete fertilizer (13-13-13) in a circle starting 2 feet from the base of the tree out to the edge of the drip line. Apply half of the fertilizer in early spring and the remaining half in August (late summer). If the trees indicate nitrogen deficiency (pale foliage, less than 10 inches of shoot growth) add 1/2 pound 33-0-0 to the August application.

Mature trees -- Fertilize at the rate of 1 to 1 1/2 pounds of a complete fertilizer per year of age until trees are 8 to 10 years old. Then apply 8 to 10 pounds per year. Divide this fertilization into 2 applications - early spring and late summer. If trees indicate nitrogen deficiency, add 1 pound of 33-0-0 to the late summer application. If soil tests indicate high levels of phosphorus, do not use a complete fertilizer. Instead, base fertilization on soil test recommendations.

Irrigation

Fruit trees respond well to irrigation during times of drought. Prolonged summer droughts reduce vegetative and fruit growth. If it is needed, irrigation during the early life of a fruit tree will speed the development of the tree structure and bring the tree into bearing up to 2 years earlier than nonirrigated trees. The fruit from a bearing tree that is irrigated during a prolonged summer drought will be larger than the fruit from a tree

that is not irrigated. By mid- to late summer, the irrigated bearing tree will be in better condition to set fruit buds for the following year than the nonirrigated tree will be. In general, 1 inch of water per week should suffice. Drip or trickle irrigation is ideal because the slow rate of application allows the water to soak deeply into the soil. This encourages deep root growth that enables fruit trees to withstand better the stresses of hot, dry summer weather.

Pruning

The best time to prune fruit trees is late winter and early spring before bud break. Do not prune in October, November, December, or January.

Training the fruit tree is much easier if you start the process the year it is planted. The goal of pruning peach, nectarine, and plum trees is to create an open-centered, vase-shaped tree with the main scaffold branches covering all the area allotted for the tree. The mature tree will have branches forming the sides of the vase, and the interior of the tree will be open so that sunlight can contact all branches and twigs.

Immediately after planting, while the tree is still dormant, cut back the tree to 24 to 30 inches above the ground. This will result in the emergence of several branches near the top of the remaining stem. Avoid scaffold branches that arise from the trunk higher than 30 inches from the ground, as they will make the tree top heavy. Remove all lateral branches to within 1/2 to 1 inch of the trunk.

After growth starts, remove all the new growth except four to six branches equally spaced around the trunk. Branches arising lower than 20 inches above the ground are less desirable than those higher on the stem. At the end of the first season of growth, reduce the number of lateral branches to 3 or 4 spaced about 6 inches apart vertically and equally distributed around the tree trunk (*Figure 1*). These will become the main scaffold branches of the tree. Choose branches of equal vigor. Sometimes weak branches will never catch up with more vigorous branches and will eventually be removed. It is very desirable to have the scaffold branches growing at a 45° angle from the trunk of the tree. A branch that is more upright, with a less than 45° angle, will be more vegetative than fruitful. If the branch grows at an angle more than 45° from

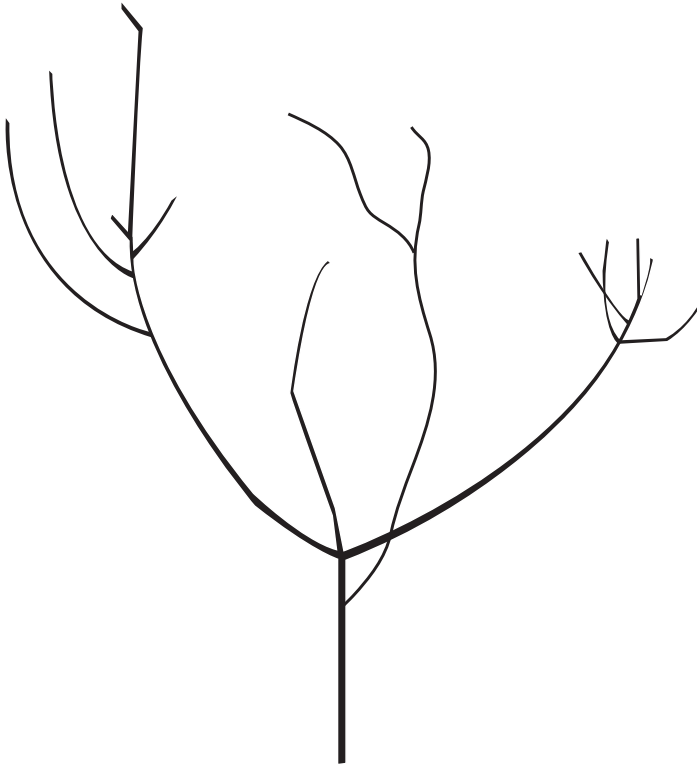


Figure 1. At planting, cut back the tree to 24 to 30 inches from the ground. Several branches will emerge from the remaining stem. Select 4 to 6 branches equally spaced around the trunk. At the end of the first season of growth, reduce the number of lateral branches to 3 or 4 equally distributed around the trunk. These will become the main scaffold branches of the tree.

the trunk, horizontal to the ground or lower, it will lack sufficient vigor to be a useful scaffold branch.

First year dormant pruning – To encourage branching, remove the terminal bud of the selected scaffold branches after the first growing season. The tree needs maximum foliage during the first through third growing seasons to establish the tree structure. Minimal pruning that leaves maximum foliage is desirable in the first and second dormant prunings. Prune to establish the vase shape.

Second and third years - In the dormant pruning after the second and third seasons of growth, continue to train the main scaffold branches so they grow at a 45° angle. Remove

strong sprouts that are growing straight up. If the scaffold branches start growing too upright, prune them back to selected branches growing at the desired 45° angle. This is the time to build the framework of the tree for the future. The primary and secondary scaffold branches will support the foliage and fruit in future years. Arrange the scaffold branches so that sunlight can penetrate the tree canopy to maintain fruitwood from top to bottom of the canopy, rather than only at the top.

Mature tree pruning – After the primary scaffolds and main framework of the tree are established, the goal of annual dormant pruning is to maintain an optimum amount of fruiting wood distributed evenly throughout the tree canopy (Figure 2). The current year's fruit buds of peach, nectarine, and plum are formed on the previous season's growth and are visible by August. It is necessary to leave many of these new shoots during pruning so the tree will produce fruit. As the tree grows older, renew the fruiting wood by removing 2- to 3-year-old shoot growth and leaving new or 1-year-old growth. Prune to maintain the desired height.

Some people prefer to keep fruit trees short so that all pruning, thinning, and harvest can be done from the ground without a ladder. Taller trees can produce more fruit than shorter trees can, but they require more labor for spraying, pruning, thinning, and harvesting. To mature to optimum size, each peach fruit requires 35 to 45 leaves. Pruning away fruitwood is the first step in thinning the fruit load on a tree. Thinning the fruit load optimizes fruit size and keeps branches from being broken because of too much fruit weight. A healthy situation for a fruit tree is to have a full crop of fruit that the tree can support without help.

Remove any sprouts arising below the bud or graft union because they are from the rootstock and probably will not produce desirable fruit.

Fruit Thinning and Harvesting

Dormant pruning removes a large number of flower buds and partially thins fruit. Thin fruit from overloaded trees so they can produce fruit of adequate size and good quality. Thinning also helps prevent limb breakage.

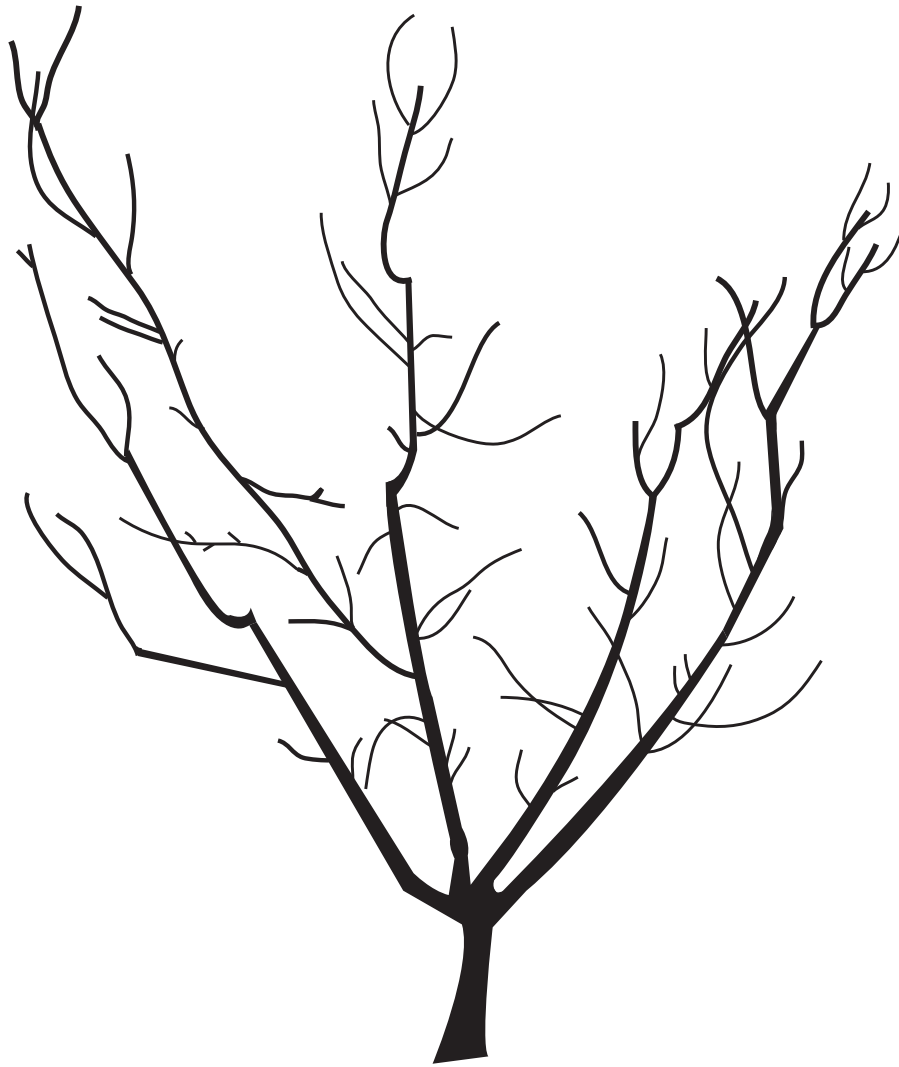


Figure 2. Mature tree-pruning - After the primary scaffolds and main framework of the tree are established, the goal is to maintain an optimum amount of fruiting wood distributed evenly throughout the tree. Pruning should allow sunlight to penetrate the tree canopy to maintain fruitwood from top to bottom of the canopy.

Peach and plum fruit should be spaced 6 to 8 inches apart on the fruiting branches. Early-ripening varieties need greater spacing and must be thinned before pit-hardening to produce large fruit. Later maturing varieties can be thinned at the pit-hardening stage without much loss in final fruit size.

Generally, fruit in the top of the tree canopy will grow larger than fruit in the bottom of the canopy, so fruit lower in the canopy should be spaced farther apart than those in the top. An advantage of homegrown fruit is that the best

quality possible can be attained by allowing fruit to ripen on the tree. Most fruit for commercial use is picked 3 to 7 days before soft ripeness so it can withstand handling and shipping.

Peach ripeness is estimated by the disappearance of green and the development of yellow undercolor on the fruit. Harvest the fruit by hand with a slight twist of the wrist to loosen the fruit from its stem.

To keep bruising at a minimum, place picked fruit into shallow containers.

Pest Control

Generally, success of the orchard depends largely on the care and attention given the trees throughout their lifetimes. Maintain a rigid spray schedule for insect and disease control. The primary insect pests in Mississippi are the catfacing insects that result in misshapen fruit, worms that feed inside the fruit, borers that attack the tree trunk at the soil line, and several other insects and mites that attack the trees. Brown rot is a disease that commonly attacks ripening fruit.

General information about peach, nectarine, and plum pests can be found in MSU-ES Publication 568, Homeowner Peach & Plum Insect and Disease Control. Regulations for agricultural pesticides change frequently, so check chemical label directions before use.

Keep weeds and grass at least 4 feet away from the tree trunk. Weed competition will reduce growth of young orchard trees. Keeping weeds and grass away from the tree trunk will also reduce the risk of damage from lawnmowers and string trimmers.

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