The LOUISIANA Home Orchard

DECIDUOUS TREE FRUITS

LSU AgCenter
Research · Extension · Teaching

The Louisiana Home Orchard: Deciduous Tree Fruits

Home fruit production in Louisiana offers a satisfying way to enjoy fresh fruit. Whether you have a small urban garden or a large rural space, incorporating fruit trees into your landscape can be both attractive and productive.

To grow quality fruit, you must diligently care for your plants. Success depends on selecting the right varieties, choosing a good site, training and pruning correctly, and managing fertility, water and pests appropriately. The scale of your planting should be determined by the space available, site, the size of your household and the time you can devote to orchard maintenance.

Selecting a Good Location

The success of a home fruit tree planting is influenced greatly by the site. Fruit trees should be planted in full sun for maximum productivity. An exception to this is the pawpaw tree, which benefits from shade during establishment.

A deep, well-drained soil with good surface and internal drainage is important. Most fruit trees will not grow well in water-logged soil. Avoid low areas where water accumulates and sites with high water tables or restrictive layers.

Cold air, like water, flows downhill. Avoid low-lying areas (frost pockets) when planting fruits like peach and apple that bloom early in the year.

Choosing the Right Kind of Fruit

The decision to plant fruit trees should involve careful species and cultivar selection. Not all fruit species are adapted to Louisiana's growing conditions. Even among different cultivars of the same fruit tree species, some may flourish in our climate while others fail to thrive. Planting a fruit tree without first considering its adaptation to Louisiana's growing environment is a leading cause of failed orchards and homeowner disappointment.

Varieties that are well-known or commonly found in stores are not necessarily well-suited to Louisiana. For example, the Elberta peach needs more chill hours than southern Louisiana provides and has been replaced by better varieties. Similarly, the Bartlett pear is highly susceptible to fire blight, making it unsuitable for Louisiana's climate.

Many factors contribute to the adaptation of fruit species to an area. Some of these conditions are discussed here.

Chilling Requirement

Deciduous fruit trees enter dormancy in winter and remain in this state until they experience a specific amount of cold exposure, followed by warm temperatures that promote growth. The amount of cold exposure required to break dormancy, known as the chilling requirement, is often measured as hours below 45 F or between 32 F and 45 F, though other models are sometimes used.

Fruit species and varieties vary greatly with respect to the number of chilling hours needed to break dormancy and allow abundant flowering and fruit production. Some varieties require as few as 200 to 300 chilling hours, while others need more than 1,000 hours.

If a plant does not receive enough chilling hours, this can lead to delayed leafing out and flowering, scattered blooms over an extended period or flower drop. In extreme cases, plants that consistently lack sufficient chilling may not survive more than a season or two. Conversely, if a variety has a chilling requirement too low for its location, it may emerge from dormancy too early. This premature awakening can result in flowers or young fruit being damaged by late freezes, severely impacting fruit production.

Figures 1A and 1B show maps of Louisiana based on the number of hours at and below 45 F received between Oct. 1 and Feb. 28 over the 30-year period between 1991 and 2020. Figure 1A shows the average (median) chilling hours and represents the typical conditions you might expect. However, relying solely on average chilling hours can be misleading, as it means that in half of the years, the chilling hours may fall short.

To provide a more conservative guide, Figure 1B shows the 10th percentile chilling hours. This map indicates the minimum number of chilling hours received in all but three out of 30 years. This is helpful for ensuring that your fruit trees receive adequate chilling in most years, reducing the risk of poor performance.

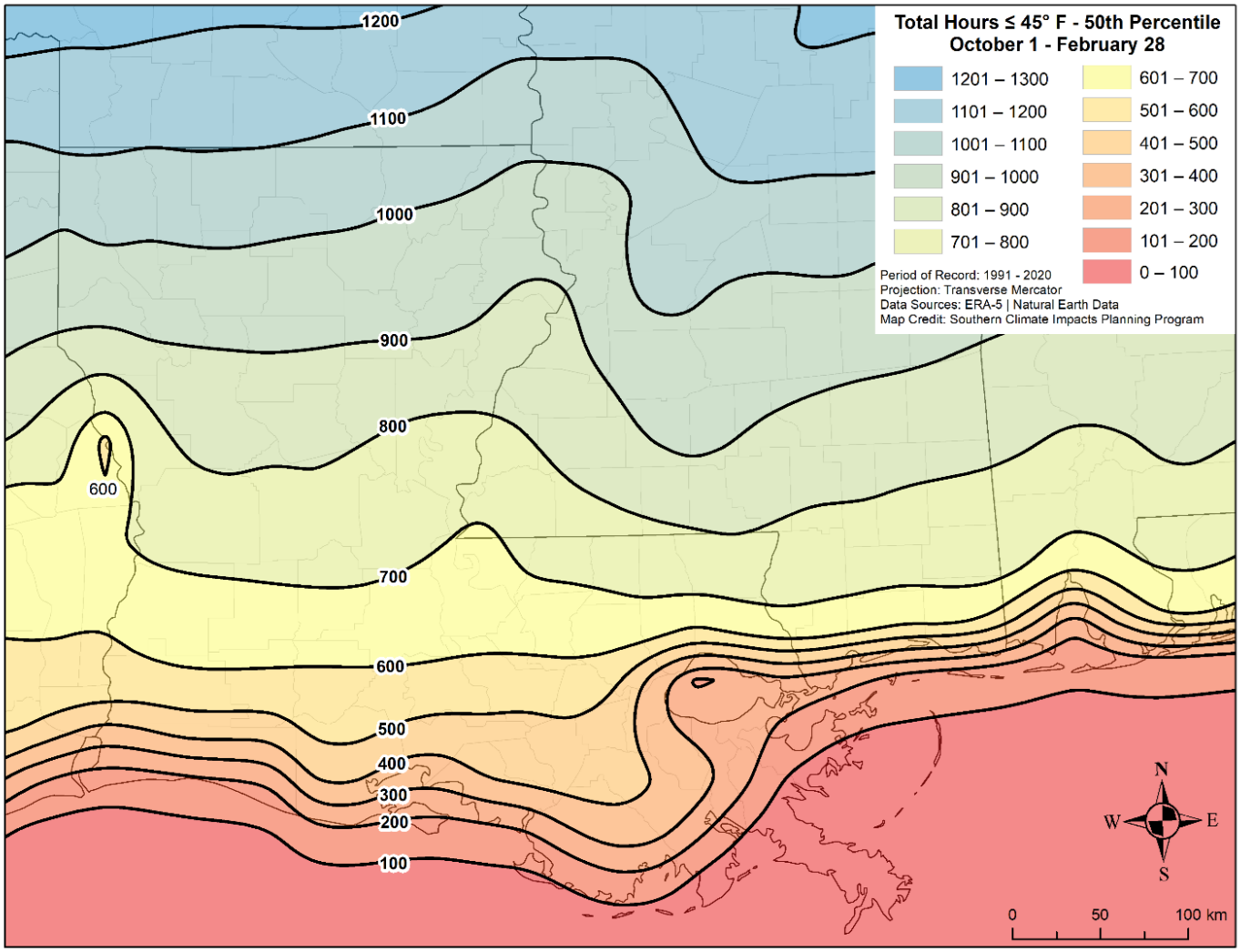

Figure 1A. Hours below or equal to 45 F model, 50th percentile (median) contour map. Half of years had fewer and half had more than the indicated number of hours below or equal to 45 F.

Jujube

Ziziphus jujuba

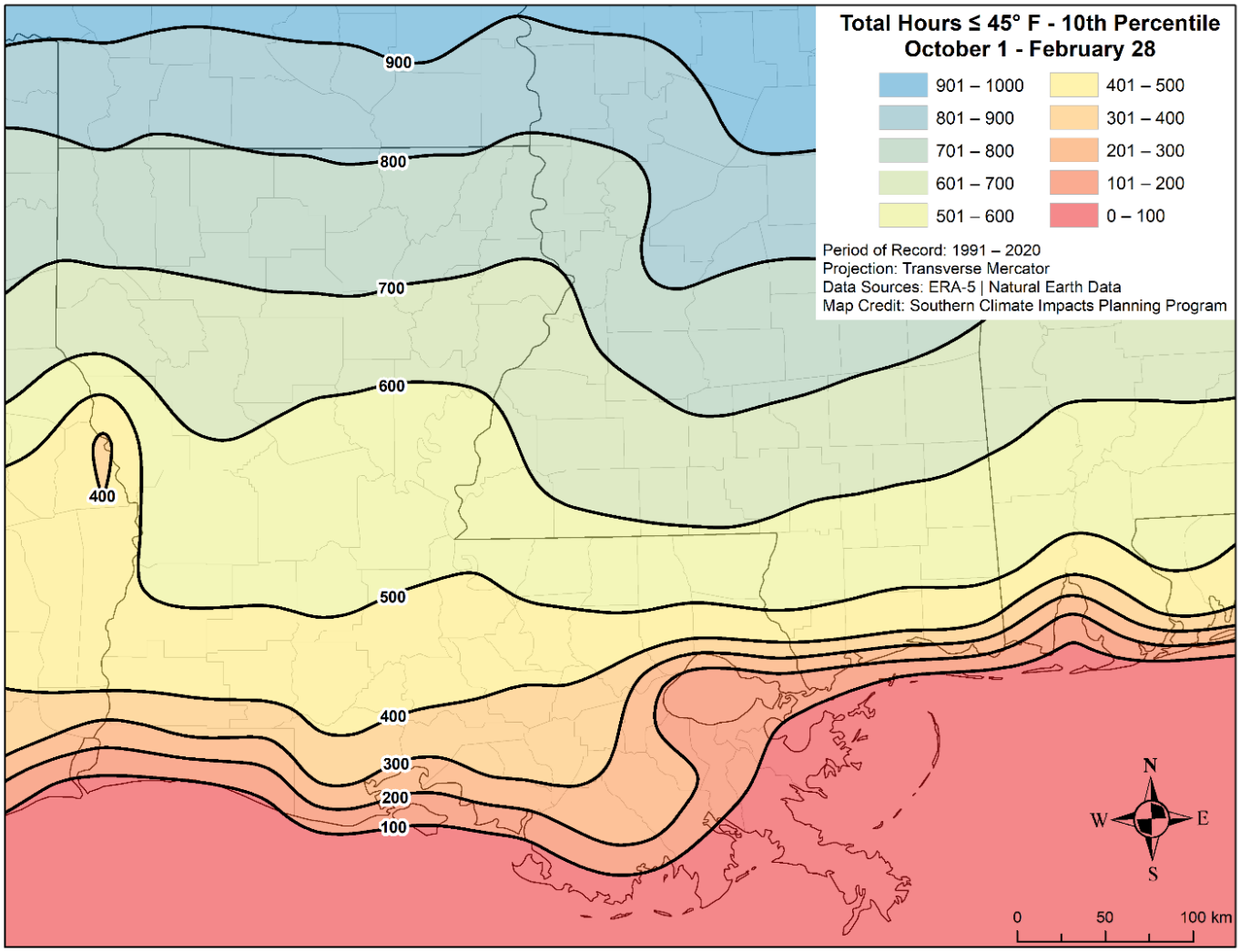

Figure 1B. Hours below or equal to 45 F model, 10th percentile contour map. Three of 30 years had fewer than and 27 years had more than the indicated number of hours below or equal to 45 F.

By comparing both maps, you can better understand the range of chilling hours your location might experience. The average map (Figure 1A) shows typical conditions, while the 10th percentile map (Figure 1B) helps you plan for more consistent and reliable fruit production.

Because there are different methods of calculating and communicating chilling requirements, as well as other factors that affect variety suitability, it is difficult to know whether a variety will be suited to a particular location based solely on the stated chilling hour requirement. Knowledge about what varieties have performed well over the long term in an area is desirable.

Insect and Disease Resistance

Some tree fruits have insect and disease problems that require multiple pesticide applications per year to produce what many would consider an acceptable quantity of high-quality fruit. Many home gardeners do not have the time, chemicals and equipment to maintain such spray programs. This problem can be minimized by selecting fruit types with few insect and disease problems or selecting varieties with resistance to known issues. Among tree fruits, fig, persimmon and some pear varieties are relatively low maintenance, while apples, peaches, nectarines, plums and mayhaws typically require more attention to disease and insect management.

Pollination Requirements

Some fruit trees have perfect flowers with both male and female parts and are self-fertile. When they are able to bear fruit as a result of pollination from flowers of the same variety, they are said to be self-fruitful. Examples include peach and nectarine.

Many fruits with perfect flowers set little or no fruit when pollinated with their own pollen and require pollen from another variety to set fruit. These varieties are self-unfruitful. Examples include most apple, pear, plum and pawpaw varieties. When cross-pollination is required, at least two varieties with complementary bloom periods should be planted within approximately 50 to 100 feet of each other. A variety that provides pollen to fertilize flowers of another variety is called a pollinizer.

Rarely, the pollen-producing or staminate (male) flowers, which never produce fruit, are borne on separate trees from the pistillate (female) or fruit-producing flowers. In such cases, it is necessary to have at least one plant with male flowers to serve as a pollinizer. A plant with only staminate flowers will normally pollinate numerous plants with female flowers. Native persimmon is an example of this type of fruit tree.

Finally, a few fruits are parthenocarpic, or capable of setting fruit without pollination. Common figs, which are the type typically grown in Louisiana, and some Oriental persimmon varieties produce fruit parthenocarpically. Like self-fertile varieties, parthenocarpic fruits are considered self-fruitful.

Table 1. Variety and Spacing Recommendations.

Fruit	Varieties	Within-Row Spacing (Feet)[1]	Notes
Apple – north[2]	Gala, Golden Delicious, Granny Smith, Mollie's Delicious, Ozark Gold, Red Delicious, Stayman	18-25 (seedling, not grafted) 14-18 (MM.111 rootstock) 12-16 (MM.106 rootstock) 10-14 (M.7a rootstock) 8-12 (M.26 rootstock) 6-8 (MARK rootstock) 4-8 (M.9 rootstock)	Trees on rootstocks more dwarfing than MM.106 do not tend to perform well in Louisiana. Avoid rootstock MM.106 on poorly drained sites. Stayman cannot pollinize other varieties, so at least two other varieties should be planted with it.
Apple – south[2]	Anna, Dorsett Golden, Ein Shemer, Mollie's Delicious, TropicSweet	See above row.	TropicSweet is suggested for trial only. Ein Shemer growth is subpar, but it can be grown for cross-pollination of other varieties. Mollie's Delicious is recommended only for areas that regularly receive at least 450 to 500 chill hours. Also see above row.
Fig (Common)	Alma, Celeste, Champagne (Golden Celeste), Hardy Chicago, Kadota, LSU Purple, LSU Gold, O'Rourke (Improved Celeste), Scott's Black, Southeastern Brown Turkey (Texas Everbearing), Tiger (Giant Celeste)	15-20	Alma may experience cold damage in north Louisiana.
Jujube	Many available	12-15	
Mayhaw	Double G, Maxine, Red Champ, Surprise	15-20	

Table 1. Variety and Spacing Recommendations. (cont.)			
Fruit	**Varieties**	**Within-Row Spacing (Feet)[1]**	**Notes**
Mulberry	Boysenberry, Downing; many varieties available. Avoid white mulberries, which are invasive. Choose red ones, which are native.	30-50	May not grow well in southernmost Louisiana. Plant away from house due to mess left by birds.
Nectarine – north[2]	Karla Rose	20	
Pawpaw	Louisiana seedlings, Overleese, Susquehanna	8-12	May not perform well in the southernmost part of Louisiana.
Peach – north (north of Alexandria)	Surecrop, Ruston Red, Flameprince, Redglobe, Majestic, Ouachita Gold, Dixiland, Harvester, Regal, Gala, Goldprince, Springprince, Juneprince	20	Peach variety suitability varies a great deal within the state, depending on chill hours received. Find out what varieties have performed well locally.
Peach – mid (latitudes between Alexandria and Baton Rouge)	Ouachita Gold, Dixiland, Harvester, Regal, Gala, Goldprince, Springprince, Juneprince, La Rouge, La Belle, La Feliciana, Delta, Sam Houston, Texstar, La Festival, La Pecher	20	See above note.
Peach – coastal (latitudes south of Baton Rouge)	Delta, Gulfcrest, Sam Houston, Texstar, La Festival, La Pecher, Rio Grande, Flordaking, Gulfking, EarliGrande, Flordaprince	20	See above note.
Pear – north[2]	Ayers, Maxine, Moonglow	20	
Pear – north and south[2]	Kieffer, Orient, Spalding	20	
Pear – south[2]	Baldwin, Flordahome, Pineapple	20	Flordahome and Pineapple may bloom too early in some years.
Persimmon (Oriental)	Eureka, Fuyu, Fuyu Imoto, Hachiya, Hana Fuyu, Ichikikei-Jiro, Jiro, Saijo, Suruga, Tanenashi	20	Eureka, Hachiya, Saijo and Tanenashi are astringent until ripe.
Plum – north[2]	AU Rubrum, Explorer, Morris, Ozark Premier, Shirley	20	
Plum – north and south[2]	Bruce, Byrongold, Methley	20	Methley is self-fruitful. These varieties may not perform well in the southernmost part of Louisiana.

[1] Distances are recommended within-row spacings. The space needed between rows depends on what equipment will be used to mow grass and perform other activities.

[2] The latitude at which Alexandria is located is generally considered the dividing line between north and south Louisiana.

Starting with Quality Plant Material

Be sure to start with high-quality, healthy plant material. Purchase fruit trees from reputable nurseries that guarantee plants to be true to name and in good condition. Be cautious of bargains. Discounts on fruit trees are most frequently offered at the end of the season or on weaker plant material. In both situations, trees will take more effort and care to get established than if you start with healthier plants or plant at the right time of year.

A common mistake is to start with large, ready-to-bear trees. Small and medium-sized trees are easier to transplant and train, and they often develop into healthier, more vigorous trees than larger ones. A well-branched 2- to 3-year-old tree is desirable, and a 1-year-old whip is acceptable.

Handling Bare Root Trees

Protect bare-root tree roots before planting to prevent drying out. If not planting immediately, heel them in or store in a cool, moist environment (Figure 2). Of those options, holding plant material in a cooler is preferred, but heeling in is useful if you do not have the capacity to hold the trees in cold storage. When heeling in, distribute the roots of the plants in well-drained soil in a shallow trench, cover them with soil and keep them moist. Heeling in is a temporary solution, and trees should be planted in their permanent home before they break dormancy. When storing in a cooler to maintain dormancy, check often to ensure there is adequate moisture.

Figure 2. How to heel in bare-root trees if they cannot be planted immediately.

Planting

Plant bare-root fruit trees during the dormant season (approximately mid-November to February) to allow roots to establish before spring growth. Container-grown trees can be planted at any time of year if enough attention is given to their care, but planting between fall and early spring is preferable. This allows them some time to get established before experiencing high temperatures and greater water demand.

Dig a hole large and deep enough to permit setting the plant without bending, breaking or crowding the roots. One approach is to follow the recommended practice for planting containerized landscape trees and dig a hole two to five times wider than but the same depth as the root ball. This loosens the soil around the

root ball to encourage roots to expand into that area. An approach that requires less time and labor is to dig a hole slightly larger than the diameter of the root system. When using either technique, roughen the sides of the holes if they are slick. Slick sides can impede water movement and root penetration. The poor drainage that slick sides create can lead to plant drowning during wet periods. This occurs more frequently in heavy, clayey soil types and when an auger has been used to dig the hole.

Set the plant upright in the hole (Figure 3). Soil under the tree should be firm so that it will not settle, and the root flare should remain above the soil line. Plant grafted trees so that the graft union is at least 2 inches above the soil. When planting containerized plants, the top of the substrate should generally be flush with ground level, unless the tree was planted too deeply in the pot. If the latter is the case, some potting mix may need to be brushed away to uncover the root flare. Avoid planting too deeply, as this can eventually result in tree death.

It is best to backfill with the native soil removed from the hole. This will reduce the potential for internal drainage problems. Do not backfill with organic matter or potting mix, as this can contribute to internal drainage problems. Fill the hole about two-thirds full with the native soil and then run some water into the hole to help settle the soil. After the water has soaked in, fill the remaining top one-third of the hole with soil. Finish by watering thoroughly. Watering during and after planting helps settle the soil and remove large air pockets. If this step is omitted, delicate feeder roots may become desiccated.

When planting in soils with poor drainage or a high water table, planting trees on a crown or mound can be beneficial. Mounds created for those settings should be a minimum of 3 feet wide. Height will vary based on the soil conditions and desired management strategies. A height of 8 inches that settles to 4 inches over time should be adequate for most growing conditions. A structure may be needed to support beds higher than one foot. If mounds are used, they should be set up and allowed to settle several months prior to planting.

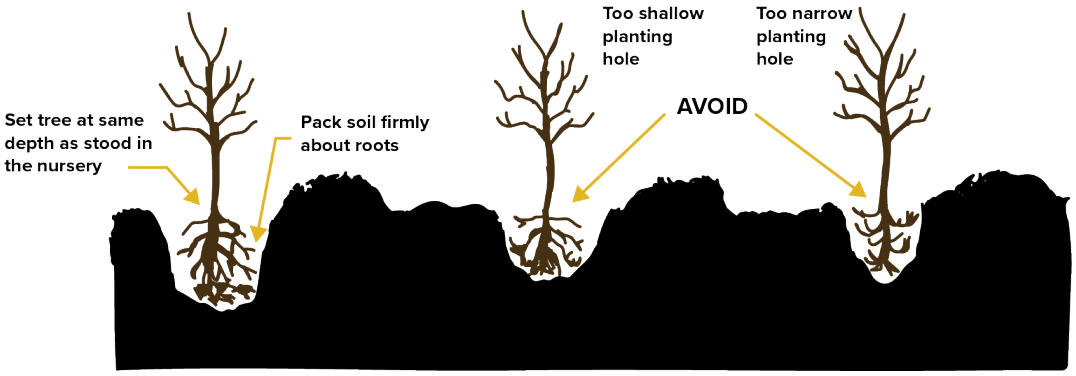

Figure 3. The proper technique for planting a fruit tree.

Cultural Practices

Weeds must be managed so they will not compete for fertilizer and water. This can be done by shallow cultivation, with an appropriately labeled herbicide or with mulch. Though shallow cultivation is effective, it can negatively impact the root systems of fruit trees. Herbicides can be utilized safely and effectively if label directions are followed. Mulching is effective, especially when combined with herbicide use, and has the added benefit of improving soil health and structure when done properly.

Materials that can be used for mulch include pine needles, pine bark, hay, straw, leaves, sawdust, grass clippings, peat moss and bagasse. In addition to suppressing weeds, natural mulches add organic matter to the soil, help keep the soil cool in summer and conserve moisture. A layer of 2 to 4 inches of mulch is typically appropriate. Do not apply mulch in excessive amounts or allow it to be in direct contact with the trunk or root flare. Nitrogen deficiencies may occur temporarily when some types of mulch begin to decay. This is especially true when using materials like sawdust but can be overcome by using nitrogen-containing fertilizers.

Fruit trees can be grown successfully within lawns, but additional fertilizer must be supplied to support both the lawn and the fruit trees. The area immediately around the base of the trunk should be kept free of vegetation, if possible. The remaining area under the canopy should be kept mowed to prevent grass from taking too many resources from the fruit tree. Care must be taken in creating and maintaining the grass-free area to avoid injury from string trimmers or herbicide drift. Mulches are desirable for at least the first few years to allow the plant to become well established with less competition.

Soil Fertility

Ideally, a soil test should be taken several months before planting. If the report indicates that pH should be adjusted, either lime (to raise pH/make soil less acidic) or sulfur (to lower pH/make soil more acidic) can then be incorporated into the soil several months before planting. Adjustments to levels of nutrients such as phosphorus and potassium can also be made at this time, if needed. Application of nitrogen before planting is not recommended.

Fertilizer application is not recommended at the time of planting. In the spring, after growth begins, one-half pound per tree of a complete fertilizer such as 8-8-8 or its equivalent can be applied. Do not place fertilizer next to the base of the trunk. Fertilizer should generally be applied around the drip line (edge of the plant canopy) of young trees and just out from there.

After the first year, make the first fertilizer application late in the dormant season (Table 2). In Louisiana, this is usually between February and early March. Applying additional fertilizer later in the season can be advantageous for some fruit species. A light fertilizer application in June or July can be made. When applying fertilizer, spread it along the dripline, toward and away from the trunk.

In lawns, it may be beneficial to place the fertilizer in small holes in the ground, about 6 inches deep. This process is called dibbling. Dibble applications of fertilizer ensure that more of the fertilizer goes to the fruit tree rather than the lawn. The number of holes required depends on the size of the tree. More holes allow better distribution of fertilizer, but the recommendations about the total amount per plant should still be followed. Avoid concentrating large amounts of fertilizer in a small number of holes, as this can injure the tree.

Avoid excessive vegetative growth, which can be spurred by overfertilizing with nitrogen. It can cause delayed fruiting and increased susceptibility to certain diseases. Also, avoid applying fertilizer in late summer or fall, as this may encourage late season growth and increase susceptibility to winter injury.

Table 2. Fertilizer Recommendations.[1]

Fruit	Fertilizer Suggestions
Apple	1 lb. 8-8-8/yr. tree age, up to 5 lb. per tree
Fig	1/2 lb. of 8-8-8/yr. plant age, up to 7 lb. per plant
Mayhaw, miscellaneous	1/4 to 1/2 lb. 8-8-8/yr. tree age, up to 5 lb. per tree
Peach, nectarine	1 lb. 8-8-8/yr. tree age, up to 8 lb. per tree (Additional applications can be made in April and after harvest.)
Pear, persimmon (Oriental)	1/2 lb. 8-8-8/yr. tree age, up to 5 lb. per tree
Plum	1 lb. 8-8-8/yr. tree age, up to 8 lb. per tree

[1] Fertilizer should not be placed within 9 inches of plant. Because of varying soil types and levels of fertility, it is difficult to make one fertilizer recommendation that will apply equally in all parts of the state. Therefore, only general fertilizer recommendations are presented here. Rates are based on 8-8-8 fertilizer, but equivalents can be used. Fertilizer amounts equivalent to 1 pound 8-8-8 include 0.8 pound 10-10-10, 0.6 pound 13-13-13, and 0.5 pound 17-17-17. One pound of mixed fertilizer is approximately 1 pint (2 cups).

Training and Pruning

Fruit trees should be trained beginning at planting and pruned as needed over the life of the tree.

The purpose of training young, nonbearing trees is to shape the tree so scaffold limbs will be well distributed. This is the best way to avoid narrow branch angles/weak crotches (the angle between the limb and trunk) and limb breakage. Careful selection of scaffold limbs early in the life of the tree will minimize the need for larger cuts later, thereby reducing the likelihood that wood rotting fungi will infect older trees.

Apple and Pear

Young trees: Apples and pears are commonly trained to the central leader form, which is a single trunk (leader) with scaffold branches growing from it. A sparse Christmas tree is an example of the central leader form.

The trunk should be larger than the branches, and whorls of scaffold branches should be spaced out along the trunk. The lowest branch should generally be 2 to 3 feet from the ground, but this is a matter of personal choice.

Two-year-old trees received from the nursery typically have many lateral branches that will need to be thinned. Trees may have one, two or more leaders (upright-growing shoots) at the top of the tree. Cut off all but one of these leaders. If there are two or three leaders, they form narrow V-shaped crotches where they join. Narrow crotches are weak and are more likely to break in a storm or under a heavy crop load (Figure 4). When deciding which leader to save, try to pick the one closest to the center of the tree or the one that looks like it has more long-term potential.

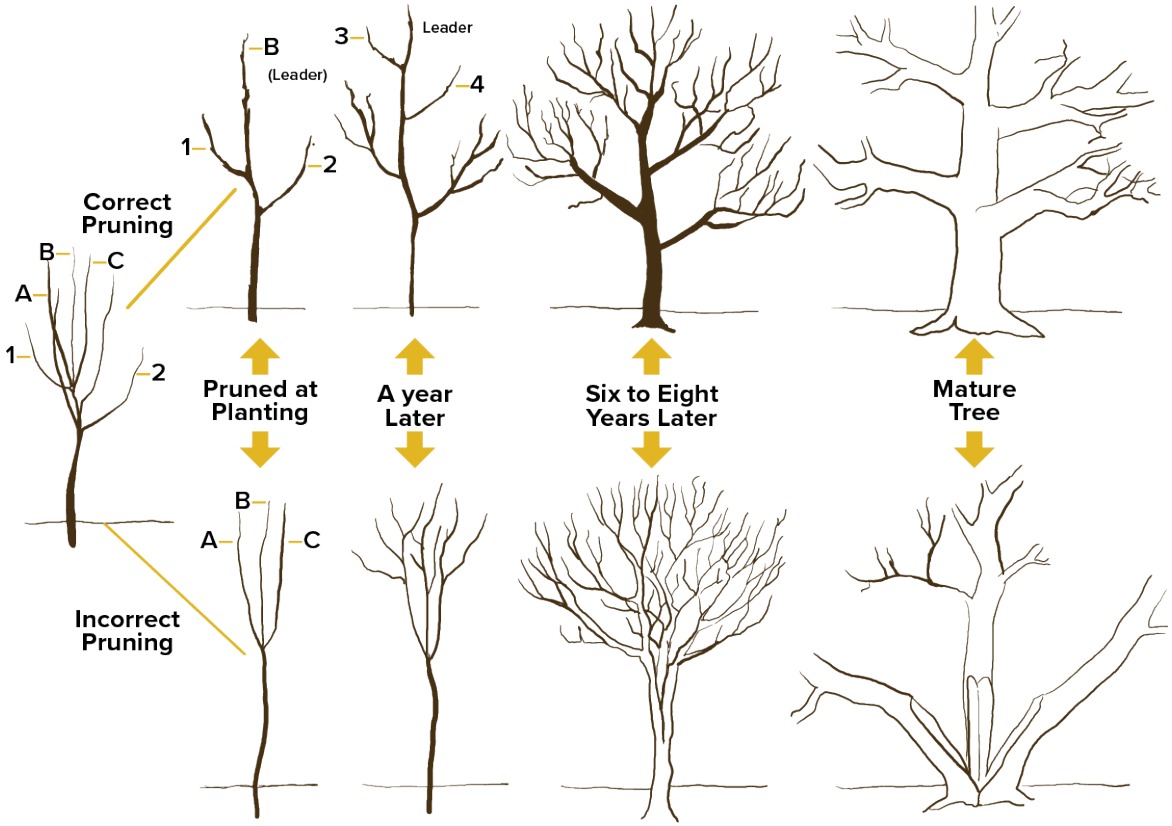

Figure 4. The proper and improper training of an apple or pear tree.

After selecting the leader, choose the first or lowest branches for your tree. It is important that all scaffold branches have wide crotch or branch angles (60 to slightly less than 90 degrees from the vertical) where they join the trunk.

Many methods can be used to spread branches. Toothpicks (for very young shoots), clothes pins, wooden spreaders or homemade weights can be used to spread branches to a more horizontal position. Pear and apple trees are slow to begin bearing. Tying down or bending of the upright branches tends to induce fruit bud formation and encourages early production (Figures 5 and 7). Make sure that any materials used are removed before they girdle limbs.

Figure 5. Bending limbs to a nearly horizontal plane, close to 90 degrees from the trunk, and tying them in that position will help develop a strong framework and induce early fruit bud formation. It is important to not bend the branches in a sharp arc with the tips lower than the origin of the branch at the main trunk. If the branch is arched in this manner, over 90 degrees, vigorous shoots will arise at the bend.

During the first year of training, the tree typically develops several branches and a central leader. Cut back long leaders to about 20 inches. New lateral branches will grow from the leader the following year. From these, you can select three to four additional scaffold branches.

During the first few winters, cut the leader to about 24 to 30 inches above the highest scaffold branch while the tree is dormant. This encourages the formation of additional lateral branches. During the growing season, select one shoot growing just below the cut as the new central leader and remove all other branches within 4 inches of this shoot. Allow three to four shoots within the 8-inch space below the 4-inch gap to remain as scaffold branches. As the tree grows taller, cut the top off at about 10 feet, making the cut at the junction of a lateral branch. This form is known as the modified leader.

The vertical space between whorls of branches should be 18 to 24 inches, and the branches should be evenly distributed around the central trunk. If a branch is longer than one or more under it, prune it back enough so that it will not shade those below it. Once the permanent scaffold branches are selected, it is okay to allow other side branches to grow, but remove them within a year or two to avoid interfering with the development of the permanent branches. Avoid branches with narrow crotch angles. Note that severe pruning of young apple and pear trees can delay flower bud formation, with severe heading back causing more delay than thinning.

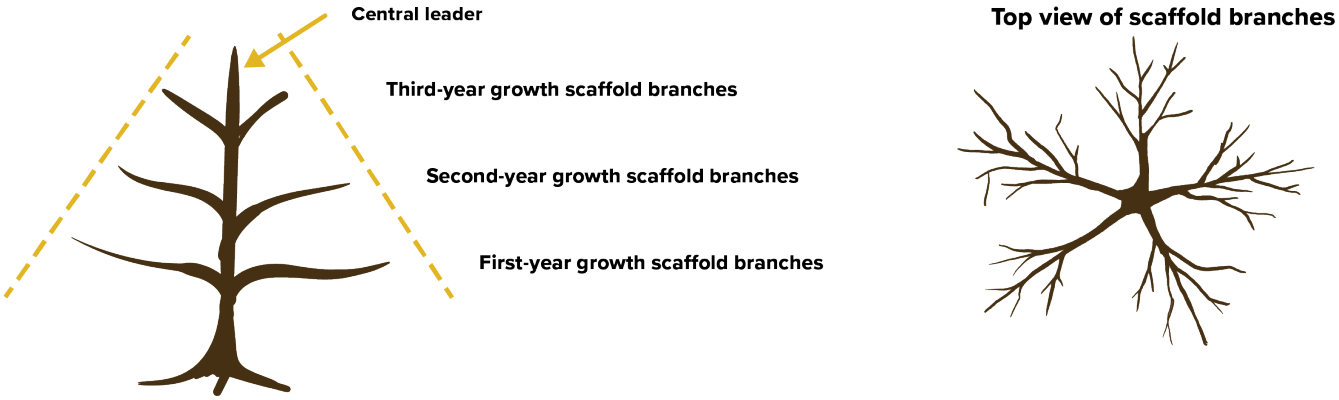

Figure 6. Example of a central leader and scaffold branches, plus a top view of scaffold branches.

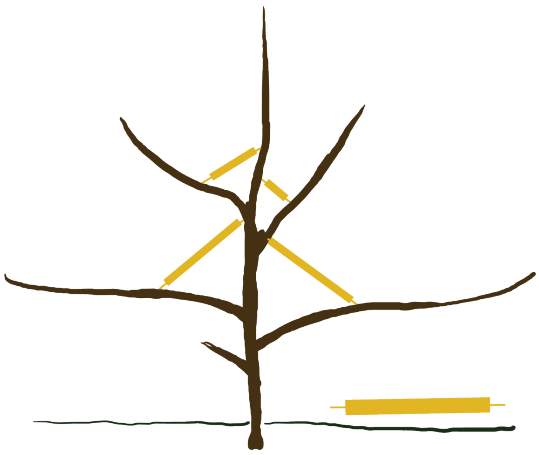

Figure 7. Wooden spreaders can be cut to various lengths with an approximate size of 1 square inch. A 1 7/8- or 2-inch nail can be driven about halfway into each end of the wooden spreader, the heads of the nails can be cut off and the sharp points of the nails will push into the bark of the tree providing a firm anchorage and thereby holding the branches in place. In young trees, upright growth is more vigorous and less productive than wood that is closer to a horizontal position.

Bearing trees: Bearing apple and pear trees require careful pruning, similar to young trees, but practices differ slightly. While pruning young trees focuses on forming the tree's framework, pruning older, bearing trees aims to balance growth by evenly distributing new growth throughout the tree. Additionally, it is important to maintain the tree's spreading habit to prevent it from becoming too tall and leggy.

Purposes of pruning mature trees include removing sprouts and dead, diseased, injured, broken or interfering branches and thinning the tops of the trees to allow sunlight penetration (Figure 8). Mature fruit trees may be pruned any time during dormancy, but the preferred time is late winter, just before growth starts. You can remove water sprouts (suckers from the lower trunk and roots) and diseased or broken branches at any time but complete all heavy pruning during the dormant period.

Figure 8. Bearing apple and pear tree before and after pruning. Note the spacing of branches and the balance of the pruned tree.

Peaches

Peach trees require more attention to pruning than most other fruit trees. They bear fruit on the previous season's growth, and pruning helps ensure an annual supply of this essential fruiting wood.

The "open center" method with three to four scaffold limbs is best for peach trees in Louisiana. During the first two to three years, focus on developing the proper framework. By the third year, the trees will begin to bear fruit and the type of pruning changes.

Young trees: At planting, prune nursery trees to a single stem and top the tree at about 24 to 36 inches. If the tree is well branched, remove side branches lower than 18 inches and cut others back to 4- to 6-inch stubs. This ensures sufficient buds for tree growth in the spring (Figure 9).

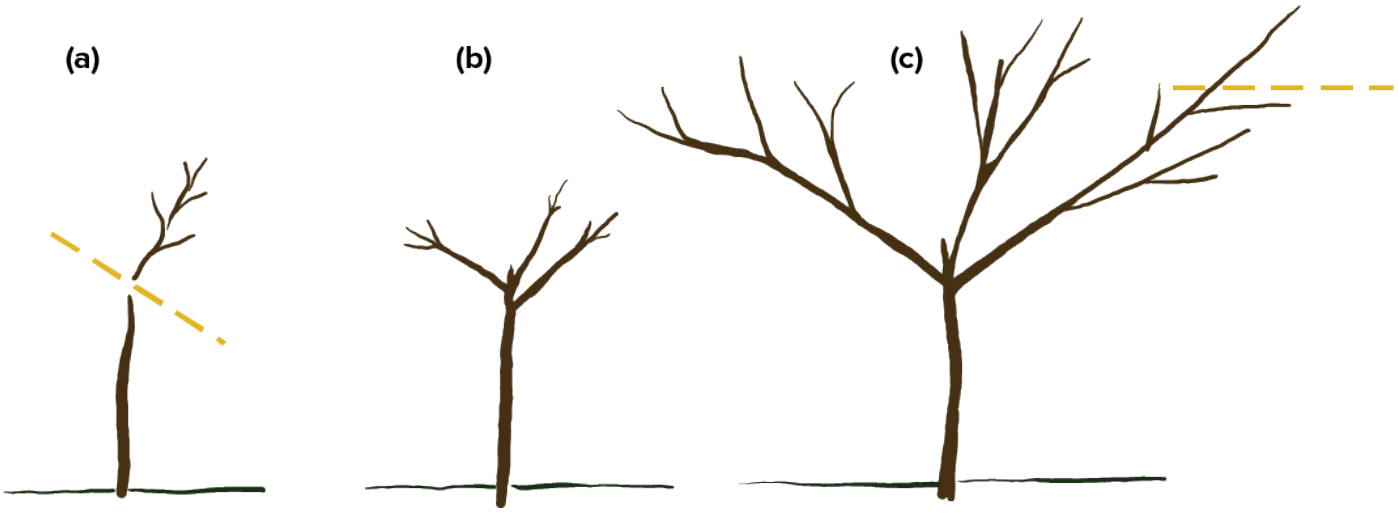

Figure 9. Peach tree (a) headed back to 24 to 36 inches at planting; (b) selection of three scaffold limbs the second year; (c) tree showing the open vase system with three scaffold limbs, keeping the tree low by always cutting back to outward growing limbs.

A few weeks after growth begins in the spring, when shoots are about 6 to 12 inches long, select three or four vigorous shoots that are 18 to 24 inches high on the trunk. These shoots will become the primary scaffold limbs and should be evenly spaced around the trunk, each pointing in a different direction. Cut back all other shoots by half. You can either remove or leave the short stub of the main stem above the scaffold limbs. If you leave the stub, keep all shoots above the scaffold limbs short. Leaving the stub can help prevent the top scaffold limb from becoming the dominant branch by acting as a spreader.

During the first winter after the year of planting, remove all branches arising from the main stem except the three to four primary scaffold branches. Head back each primary scaffold branch to an outward-growing limb. Remove low-hanging limbs and water sprouts (vigorous upright shoots) from the lower parts of main branches. Continue this same type of training and pruning during the second winter. When tree height reaches 5 to 6 feet, prune the limb terminals back to an outward-growing branch (Figure 9). This may not be necessary until the third winter. Remove any large lateral branches growing inward to prevent shading of the tree's center.

Bearing trees: Starting in the third winter, pruning will primarily involve heading back growth to an outward-growing branch and removing excess branches. Remove all dead or diseased branches. Depending on the tree's variety and vigor, it may be necessary to thin out and renew fruiting shoots. You can either allow trees to grow to a height requiring a ladder for picking fruit or prune them to a height you can easily reach (usually 6 to 8 feet).

While the center of the tree should be kept fairly open, avoid stripping the center completely of all bearing wood. Immediately after harvest, remove all large water sprouts from the center of the tree to encourage the development of fruiting wood and reduce shading. When it becomes necessary to limit the height or spread of an older tree, head back the tree to 2- or 3-year-old wood at the point where one or more side branches occur. If a heavy crop load forces limbs to grow low, head back scaffold limbs to favor an upward-growing limb.

With proper care, a peach tree may live and remain productive for 10 to 12 years or longer.

Plum Trees

Plum varieties exhibit differing growth habits, with some being more upright and others low and flat growing. Therefore, no single pruning method applies to all varieties.

Young trees: Like peaches, plums are generally pruned to the open center form. Establish the scaffold branches of plum trees during the first two or three years after planting, similar to peaches (Figure 9).

Bearing trees: Plum trees should generally be pruned lightly. Annually remove all overcrowded and low-hanging limbs, as well as excessive shoots on the trunk and main scaffold branches.

Some heading of branches may be necessary the first few years, but the pruning should mainly be a light thinning out of interfering branches throughout the top. Cutting back the top of a bearing tree is rarely done except to maintain the tree's height by heading back unusually long shoots. Maintain tree height similar to that of peaches unless you prefer larger trees.

To maintain tree vigor, heavier pruning may be necessary about every third year. Light pruning results in extremely heavy yields of medium-size fruits, while more severe pruning increases fruit size but reduces yield. Plums will generally remain productive for about the same number of years as peaches (10 to 12 years).

Bruce plums require only light pruning, which involves removing about one-third of the previous season's growth and lightly thinning interior branches and fruiting spurs. The Japanese cultivar Methley may require more pruning than the European varieties. While plums bear predominantly on spurs, some of the fruit of Japanese plum is borne on 1-year-old wood.

Figs

Figs can be trained to either the tree or bush form. For the tree form, select well-positioned laterals with wide crotch angles to form a strong framework. In subsequent pruning, head back main branches to keep them shorter than the central leader. Remove inward growth as needed to keep the tree open. Also, remove dead, diseased or damaged wood along with suckers and water sprouts.

If a bush (multiple trunk) form is desired, prune the young tree back to half its original height at transplanting. The following winter, select about five well-spaced branches for the framework.

Prune shoots growing upward short, but leave those growing outward long to encourage a low-branching, flat-topped, open form. In areas where trees are frequently killed by cold weather, the bush form is often desirable. When existing branches are killed, select new sprouts the next year and reshape the tree. Although the multiple trunk form has many advantages, the main disadvantage is that it produces a weak crotch susceptible to splitting later.

Thinning Fruit

In the absence of a late freeze that reduces the number of flowers, fruits such as peach, pear and apple set larger crops than they can mature to a desirable size. Thinning fruit from trees results in larger fruit, improved fruit color and quality, reduced limb breakage and increased overall tree vigor. It can also reduce alternate bearing in some fruit trees, resulting in more consistent fruit production from year to year. Another benefit of fruit thinning is that it allows for a more effective spraying program.

Time of thinning influences fruit size and ripening. The amount of thinning depends on the size of the tree, overall growing conditions and variety grown. As a general rule, thin early maturing varieties and those with small fruit more than later maturing varieties and varieties with larger fruit.

Peach thinning is a standard practice in all well-managed commercial orchards. Research indicates that when peaches are thinned sooner after bloom, they ripen earlier, and the fruit is larger at harvest. It is suggested that peaches be spaced 6 to 8 inches apart on the branch.

Several methods of thinning are practiced. The most common method, especially among home gardeners, is to remove individual fruit by hand. Although this method is slow, it provides more uniform fruit spacing with little or no tree injury.

Some fruit growers prefer using tools that reduce time and cost for thinning. One traditional method involves creating a thinning pole by attaching a 15-inch piece of 3/4-inch diameter garden hose to the end of a 4- to 5-foot bamboo or wooden pole, leaving 8 to 10 inches of hose extending beyond the pole. Thin peaches by gently striking the limbs about 18 inches from their tips with the flexible part of the hose. A lightweight plastic baseball bat can also be used.

Plums are not as likely to need thinning as peaches are, but it is often desirable to thin large Japanese plums by hand to about 4 inches apart.

For maximum benefit, apples and pears should be thinned to approximately 6 inches apart within 25 days after full bloom. For larger fruit, leave more space between individual fruits. The center apple of a cluster is usually the largest and the best one to leave.

If enough fruit is present, thin fruit of Oriental persimmon to 6 inches apart. Some fruit will naturally drop approximately three weeks after flowering. Perform any needed thinning shortly after that. Keep healthy fruit with large calyxes.

Harvesting

In general, fruits grown for fresh consumption at home should be allowed to remain attached to the plant until they are fully ripe. The exception is pears. Most pears, except Asian pears, do not maintain good quality if left to ripen fully on the tree. When harvested before fully ripe and stored at a temperature of 65 F for about 10 days to two weeks, they will have better eating quality. Indicators that pears are ready to harvest include lenticels (small dots where gas exchange occurs) changing color from white to brown, skin color changing from green to yellow-green and the fruit having the firmness of a softball.

Most fruits intended for processing (jams, jellies, etc.) rather than fresh consumption should be harvested at the firm ripe stage rather than fully mature. This improves the quality of the processed product.

Why Fruit Trees Fail to Bear

Fruit trees generally bear fruit when they are old enough to flower freely, provided that other conditions are favorable. Factors such as pollination, cultural practices and the environment affect a tree's ability to bear fruit. These factors, alone or in combination, can cause flowers not to develop, prevent fruit set or cause fruit to drop prematurely if conditions are not optimal. Fortunately, you can control most of these factors.

Even if trees flower freely, they may fail to set fruit or shed most of their fruit prematurely if adequate pollination does not occur. During extremely dry periods, fruit that is not completely pollinated will generally drop before those that are adequately pollinated.

For some types of fruit, at least two compatible varieties must be planted for cross-pollination. (See "Pollination Requirements" section.)

Soil fertility influences the ability of trees to hold and mature fruit. Overfertilization with nitrogen can cause excessive vegetative growth and fruit drop.

Improper pruning can cause a lack of fruit. Fruit species differ regarding whether they produce fruit on current season's growth, the previous season's growth, and/or older wood. Figs produce their main crop on the current season's growth. Peaches fruit on wood produced in the previous season, so if all of that is cut off during winter pruning, the tree will not bear that year. Apples, pears, plums and pomegranates bear some of their crop on spurs that are more than one year old, so an adequate number of these should be retained during pruning.

Severe winter pruning that causes a great deal of vegetative growth can reduce fruit production for some time. It is important to prune species that need it each year rather than pruning severely on an irregular basis.

In some instances, insects and diseases may cause fruit drop. Deep cultivation too close to trees can also cause of fruit drop. Adverse weather may damage buds or blooms directly or interfere with pollination, thus preventing fruit production.

Even if all of the previously mentioned factors are ideal, some fruit drop is likely to occur. A fruit tree normally produces more fruit buds than it can properly mature. Fruit drop is a normal physiological process and results in larger, higher quality fruit, so some fruit drop should not be alarming.

Winter Injury to Fruit Trees

Cold damage to trees depends on several factors, including the species' and variety's cold hardiness and environmental conditions. Deciduous trees enter dormancy in late fall. If they harden off gradually before a sudden temperature drop, they can typically withstand low temperatures without injury.

Trees occasionally sustain injury on the southwest side. On cold, clear days without wind, unshaded areas of the tree are exposed to the sun's full heat, raising the temperature of the exposed wood far above that of shaded parts. As the sun sets, the temperature of the exposed wood drops rapidly to match the surrounding air. This rapid change can cause plant tissue injury, leading to dead, dry, cracked bark. This is called winter sunscald.

To care for a cold-injured plant, provide adequate water and nutrients. Wait until the plant has had ample time to produce new growth before removing all dead wood. If removing an entire limb, cut just outside the branch collar, close to where the limb originates. Avoid leaving stubs, which can serve as entry points for wood-decaying microorganisms.

Insect, Mite and Disease Management

Tree fruits range from low to high maintenance regarding disease and arthropod (insect and mite) management needs, as discussed at the beginning of this publication. Some have few serious pest issues, while others require a comprehensive spray schedule with timely applications and thorough coverage for reliable production of healthy fruit. Keep this in mind when choosing what types of fruit trees to plant. Utilize disease- and insect-resistant varieties whenever possible and start with healthy plants void of obvious disease symptoms or pest infestations. Because management recommendations change as new problems emerge or new treatments become available, contact your LSU AgCenter Extension agent for current advice.

Good cultural practices help prevent disease and insect problems. Appropriate site selection, soil preparation, fertilization, tree training and pruning favor plant health. Weed management also impacts disease and insect management, since weeds can serve as hosts of some pathogens (disease-causing agents) and arthropod pests. Sanitation practices, such as removing diseased plant parts and unharvested fruit, are also critical in reducing pathogen populations.

Most insects are beneficial or benign. Broad-spectrum or nonselective insecticide use should be avoided when possible because beneficial insects and mites suppress pest populations. Pest insect and mite problems are more likely to occur when populations of beneficial arthropods have been killed by insecticides. Furthermore, not all pest insect infestations or diseases cause enough injury to justify the cost of insecticide or fungicide application. Keep in mind that fruit does not need to be aesthetically perfect to be eaten. Because home orchardists do not need to be concerned about the marketability of their fruit, some cosmetic imperfections can be tolerated.

For many diseases and arthropod pests, there are steps that we can take to prevent or manage them that do not involve using pesticides. Pesticide (insecticide, miticide, fungicide, etc.) application should be the last resort, not the first step, in managing arthropod pest and disease issues.

When insecticide usage is necessary, use them in a way that reduces risks to bees. Avoid using insecticides while open flowers are present and apply them in the late afternoon or evening when honeybees are less likely to be active. Be on the lookout for other pollinators and avoid spraying during times they may be active, as well. Some fungicides may require application during flowering times to prevent diseases later in the season. Use similar timing strategies to prevent application to pollinators.

Some common insects and diseases are discussed here. Information about insecticide, miticide, fungicide and bactericide application timings and product options is found in Tables 3-5. Pay special attention to timing, as treatments at the wrong times will provide little to no benefit.

San Jose Scale and White Peach Scale

These tiny sucking insects are about the size of a pinhead when fully grown. Both types of scale infest peach and plum trees. San Jose scale also affects apple trees. San Jose scale adults have silvery gray shells with a black center. White peach scale (sometimes called West Indian peach scale) adults have a white covering. If you flip over the waxy armor of adult San Jose and white peach scales, the bodies

underneath are orange to brown and yellow, respectively. Immature scale insects are referred to as crawlers and move around on the plant. As they mature, scale insects become fixed in place until adult males fly in their final stage of development. Scale insects can kill trees if unmanaged. See Tables 3-5 for insecticide recommendations and timing. Dormant sprays in the early winter and before bud break may be applied using dormant oil following manufacturer recommendations. Good coverage is essential as horticultural oils work by smothering the scale. Note precautions about oil use in the tables and on product labels.

Plum Curculio

The plum curculio is a weevil that attacks peaches, plums and mayhaws in Louisiana. Adults lay eggs in developing fruit. After eggs hatch, larvae feed in the fruit. These larvae are small yellowish-white, legless grubs with brown heads. Fruit infested while young usually drop before maturity. Older fruit mature with the larvae still inside. Pick up and dispose of fallen fruit to reduce the insect population. See Tables 3-5 for insecticide recommendations and timing. The insecticide applications at petal fall and within the weeks following it are especially important. LSU AgCenter Publication 3835, Bug Biz: Plum Curculio, provides more information about plum curculio.

Catfacing Insects

Feeding by insects including stink bugs, tarnished plant bugs and leaf-footed bugs causes catfacing, or distortion, of fruit. While this section focuses on peaches, other fruits can also be affected. The southern green stink bug is the most important stink bug infesting peaches, but several species of brown stink bugs, as well as the northern green stink bug, also feed on them. Tarnished plant bugs feed throughout the fruiting season and are most damaging early in the season. Their feeding kills cells in the fruit, causing misshapen fruit. Stink bugs can also cause more serious damage early in the season, because their long beaks may kill seeds, causing fruit drop. Later in the season, when fruit size is increasing during the time leading up to harvest, stink bugs and leaf-footed bugs feed on the sugars in peaches and nectarines, causing spots that may act as entrance points for disease. Tall grass and weeds attract catfacing insects into the orchard. Peach trees along woody areas and fence rows tend to sustain more damage from catfacing insects than the areas of the orchard away from the border. If stink bugs or leaf-footed bugs are the main culprits causing catfacing in your home orchard, sunflowers can be used as a trap crop. These insects are attracted to sunflowers, so you can lead them away from fruit and manage insects on sunflowers instead.

Peachtree Borer and Lesser Peachtree Borer

The peachtree borer attacks the lower trunk and large roots of peach, plum and related trees and can kill them. The presence of masses of a jellylike substance exuding from the base of the tree is often the first sign of this pest. White caterpillars with brown heads may be found burrowing into the trunk 2 to 3 inches below the soil line. A jellylike substance found on the aboveground parts of the tree, as opposed to the base, is usually caused by the lesser peachtree borer. Gummosis can have other, noninsect causes, but gum resulting from peachtree borers typically contains frass and wood bits. See Tables 3 and 5 for insecticide recommendations. Beneficial nematodes of the species *Steinernema carpocapsae* have proven effective for managing peachtree borer when applied to the base of the trunk at certain times of the year. More information is available for those interested in this approach.

Armillaria Root Rot – Many Woody Plants

This fungal disease, also called oak root rot, is a common cause of peach tree death. It can also affect many other woody plants, including apples. Avoid planting susceptible plants where the fungus has been identified. If you do plant woody plants, remove stumps and large roots of infected plants that have been cut. See LSU AgCenter Publication 3467, Armillaria Root Rot of Fruit Trees, for more information.

Brown Rot – Peach, Nectarine and Plum

Brown rot is one of the most destructive diseases of peaches and plums in Louisiana. One phase of this disease, known as blossom blight, will kill flowers where severe infections occur. On the fruit, infection first appears as a brown rotted spot that may enlarge rapidly. Later, the rotted portion becomes covered with a brown to gray mass of spores. After the fruit has completely rotted, it shrivels and mummifies. Spores are produced on these mummies, which reinfect the tree the next year if they are left near the tree. The pathogen can also overwinter in cankers and on other plant tissues. Prune out dead wood during the winter and remove mummies from around the trees. See Tables 3 and 5 for fungicide recommendations.

Scab – Peach and Plum

Scab of peaches and plums is characterized by greenish to black spots on the fruit. During early stages of infection, the spots are usually concentrated near the stem end of the fruit. The entire fruit surface becomes covered and cracks in severe cases. The fungus also forms irregular blotches on the leaves. It overwinters on infected twigs. There are scab diseases that affect apples and pears, but these are caused by other fungi. See Tables 3 and 5 for fungicide recommendations.

Fire Blight – Apple, Pear, Mayhaw and Quince

Fire blight is a serious bacterial disease of apples, mayhaws and pears in Louisiana. It also affects quince. The disease attacks flowers and young fruits and tender tips of twigs and water sprouts, causing them to blacken as if burned. Twigs are often killed back for several feet. Spurs, large branches, trunks, bases of trees and roots can also be attacked. In severe cases, the tree can be killed in one season. The first line of defense is choosing varieties resistant to fire blight. Apple, pear and mayhaw varieties recommended in this publication have some resistance to the disease. Overuse of nitrogen fertilizers increases susceptibility to fire blight and should be avoided. Prune out infected branches to reduce inoculum, making cuts approximately 12 inches below where symptoms are observed. See LSU AgCenter Publication 3054, Fire Blight, for more information, and see Tables 4 and 5 for bactericide recommendations.

Bitter Rot – Apple

This fungal disease causes lesions with spore-producing structures arranged in a bullseye pattern on apple fruit. Salmon-colored spores may be seen during wet weather. The pathogen can survive in infected fruit, dead wood, and other plants. See LSU AgCenter Publication 3420, Bitter Rot of Apples, for more information. Pear can also be affected, but the disease is not as common on pear as on apple in Louisiana.

Quince Rust – Mayhaw

Signs of this fungal disease include spiky spore-producing structures on mayhaw fruit. Twigs and leaves are also affected. Spores that infect mayhaw are produced by a stage of the fungus that occurs as galls on eastern redcedar trees and other hosts in the *Juniperus* genus. At the time when galls release spores, they look similar to orange-colored jelly. While removal of eastern redcedar trees near mayhaws may be helpful, windborne spores can travel long distances, so the effectiveness of this practice may be limited. An appropriate fungicide can be used to protect flower buds and flowers from infection (Tables 4 and 5). Quince rust or diseases caused by closely related fungi in the *Gymnosporangium* genus can also affect other rose family fruits, including apple, pear, quince and crabapple.

Pear Leaf Spot – Pear

This disease, also called Fabraea leaf spot or early leaf spot, causes a leaf spot in early summer. By August, trees may be defoliated. Initially, the spots are small (1-2 mm) and red to purple. As the numerous spots progress, the leaves turn yellow and fall. Rake up and remove fallen leaves before new growth begins. Fungicides can protect leaves from infection, but fungicide options for home orchard pears are limited.

Leaf Blights – Fig

Web and thread blight are caused by closely related fungi and affect fig leaves and, sometimes, fruit. Infection often starts at the bases of the leaves, and the fungus spreads in a fanlike fashion, producing a large, semicircular, brown dead spot. Diseased leaves may shrivel and die. Others may be full of irregular holes. In hot, humid weather, many leaves may be killed within a few days. Dead leaves are sometimes matted together and held on the tree by threads resembling spider webs. Fungal growth is often seen on branches close to diseased leaves. Remove plant parts on which fungal growth is present. Management practices that promote air movement and reduce leaf wetness are recommended. Because few fungicides are labeled for use on edible fig, disease management depends largely on cultural practices.

Fig Rust – Fig

This fungal disease commonly affects fig leaves and can cause leaf loss in summer or early fall. Symptoms include numerous small brown spots on the upper sides of leaves and slightly raised spore-producing areas on the undersides. Tiny fly larvae that feed on rust spores are often present. See LSU AgCenter Publication 3159, Fig Rust, for more information.

Table 3. Peach, Nectarine and Plum Spray Timings for Managing of Insects, Mites and Diseases in the Home Garden.

Timing	Arthropod(s) and/or Disease(s)	Chemical Options[1]	Notes[2]
Dormant season (before bud swell)	Scale insects	Horticultural oil (mineral oil)[3]	Spray trees thoroughly twice during the dormant season. Good coverage is essential.
Pink bud through bloom	Black knot (plum only)	Chlorothalonil	A fungicide can be applied to plum trees to protect new shoots from black knot as they grow. Where the disease has been a problem, apply every seven to 10 days starting when new shoot growth begins, for a total of three sprays. Do not use any insecticide during bloom.
Bloom	Blossom blight (brown rot)	Chlorothalonil or captan[3]	Do not use any insecticide during bloom.
Petal fall through preharvest	Plum curculio, catfacing insects (stink bugs, tarnished plant bug, leaffooted bugs), oriental fruit moth, lesser peachtree borer	Esfenvalerate, lambda-cyhalothrin, permethrin, or zeta-cypermethrin	Do not use insecticide until after petals have fallen. The three weeks immediately after petal fall are especially important for insect management. Stop using the insecticide when prohibited by the product's preharvest interval. These insecticides are in the pyrethroid class, and their use may cause mite populations to increase.
Petal fall through preharvest	Mites, aphids, scale	Horticultural oil (mineral oil)[3]	Apply horticultural oil if mites are a problem. Good coverage is essential.

Table 3. Peach, Nectarine and Plum Spray Timings for Managing of Insects, Mites and Diseases in the Home Garden. (cont.)			
Petal fall through harvest	Peach scab, brown rot	Chlorothalonil, captan[3], sulfur[3], or pyraclostrobin + boscalid	Do not use chlorothalonil after shuck split, which occurs shortly after petal fall. Sprays during the four weeks after petal fall are important for scab. Sprays during the three weeks before harvest are important for brown rot. Sulfur has little effectiveness against brown rot. Stop using the fungicide when prohibited by the product's preharvest interval.
Postharvest	Peachtree borer	Zeta-cypermethrin	Make several applications, beginning postharvest and continuing through September. Direct the spray at the trunk from the crotch at the scaffold limbs to the soil line. Good coverage is essential.

[1] Not all products are labeled for all crops. Check product label to make sure it is labeled for the crop to which you intend to apply it.

[2] Read product label(s) for more information and to find out if changes have been made. Follow label instructions carefully.

[3] Neither oil nor sulfur products should be used at excessively high temperatures, and oils should not be used at very low temperatures Oil and sulfur or captan products generally should not be used within 14 days of each other. See labels for specific instructions.

Table 4. Apple, Pear and Mayhaw Spray Timings for Managing of Insects and Diseases in the Home Garden.			
Timing	**Arthropod(s) and/or Disease(s)**	**Chemical Options[1]**	**Notes[2]**
Dormant season, shortly before budbreak	San Jose scale (apple, pear)	Horticultural oil (mineral oil)[3]	
Tight cluster through one month after bloom	Quince and cedar apple rusts (mayhaw, apple), powdery mildew	Myclobutanil	
Bloom	Fire blight (apple, pear)	Streptomycin or copper product (e.g., copper diammonia diacetate complex or copper octanoate)	Do not use an insecticide during bloom. Fire blight affects mayhaw, too, but most products are not labeled for mayhaw. Bloom is the most important time for a bactericide application for fire blight, but a copper product (e.g., copper diammonia diacetate complex or copper octanoate) can also be sprayed between silver tip and green tip, and a copper octanoate product can also be applied at petal fall and during the first cover spray.

Table 4. Apple, Pear and Mayhaw Spray Timings for Managing of Insects and Diseases in the Home Garden. (cont.)			
Petal fall through preharvest	Plum curculio, catfacing insects (stink bugs, tarnished plant bug, leaffooted bugs), aphids, oriental fruit moth	Esfenvalerate, lambda-cyhalothrin, permethrin, or zeta-cypermethrin	Not all products are labeled for all fruits. Check product label. These insecticides are in the pyrethroid class, and their use may cause mite populations to increase. Stop using the insecticide when prohibited by the product's preharvest interval.
Petal fall through preharvest	Mites, aphids, scale	Horticultural oil (mineral oil)[3]	Apply horticultural oil if mites are a problem. Good coverage is essential.
Petal fall through preharvest	Bitter rot, miscellaneous fruit-affecting fungal diseases (apple, pear)	Captan[3], pyraclostrobin + boscalid	Stop using the fungicide when prohibited by the product's preharvest interval. Captan products are not labeled for pear.

[1] Not all products are labeled for all crops. Check product label to make sure it is labeled for the crop to which you intend to apply it.

[2] Read product label(s) for more information and to find out if changes have been made. Follow label instructions carefully.

[3] Neither oil nor sulfur products should be used at excessively high temperatures, and oils should not be used at very low temperatures. Oil and sulfur or captan products generally should not be used within 14 days of each other. See labels for specific instructions.

Table 5. Fungicides, Bactericides, Insecticides and Miticides for Deciduous Fruit Trees in Home Orchards.				
Active Ingredient(s)	**Product Type**	**Trade name(s)[1]**	**Target diseases, insects, or mites[2]**	**Notes[3]**
Basic copper sulfate	Bactericide and fungicide	Bonide Copper Fungicide Spray or Dust Ready to Use	Leaf curl, fire blight	Peach, nectarine, apple, pear, quince. Labeled for fire blight on apple between silver tip and green tip but not after green tip reaches 0.5 inch. Labeled for fire blight on pear and quince during bloom.
Captan[4]	Fungicide	Hi-Yield Captan 50W Fungicide, Southern Ag Captan Fungicide	Brown rot (and blossom blight), bitter rot, apple scab, peach scab	Peach, nectarine, plum, apple
Chlorothalonil	Fungicide	Bonide Fung-onil Multi-purpose Fungicide Concentrate; Fertilome Broad Spectrum Landscape and Garden Fungicide; Hi-Yield Vegetable, Flower, Fruit and Ornamental Fungicide	Scab, leaf curl, blossom blight	Peach, nectarine, plum. Do not apply after shuck split.

Table 5. Fungicides, Bactericides, Insecticides and Miticides for Deciduous Fruit Trees in Home Orchards. (cont.)				
Chlorothalonil	Fungicide	GardenTech Daconil Fungicide Concentrate, Ortho Max Garden Disease Control Concentrate	Scab, leaf curl, blossom blight	Peach, nectarine, plum. Do not apply between fruit formation and harvest.
Copper diammonia diacetate complex	Bactericide and fungicide	Monterey Liqui-Cop	Bacterial spot, leaf curl, fire blight	Peach, nectarine, plum, apple, pear, quince
Copper diammonia diacetate complex	Bactericide and fungicide	Southern Ag Liquid Copper Fungicide	Bacterial spot, leaf curl, fire blight	Peach, nectarine, apple
Copper octanoate	Bactericide and fungicide	Bonide Liquid Copper Fungicide Concentrate, Fertilome Copper Fungicide	Bacterial spot, leaf curl, fire blight	Peach, nectarine, plum, apple, pear, quince
Esfenvalerate	Insecticide	Monterey Bug Buster II	Plum curculio, June beetles, catfacing insects (plant bugs, stink bugs), aphids (not woolly apple aphid), leafhoppers, leafrollers, lesser peach tree borer, oriental fruit moth, apple maggot	Peach, nectarine, plum, apple, pear
Imidacloprid	Insecticide	Bonide Systemic Insect Spray with Systemaxx, Hi-Yield Systemic Insect Spray, Martin's Dominion Tree and Shrub Insecticide Concentrate	Aphids (except woolly apple aphid), leafhoppers	Peach, plum, apple, pear
Mineral oil[4]	Insecticide and miticide	Bonide All Seasons Horticultural and Dormant Spray Oil Concentrate, Monterey Horticultural Oil	Scale insects, mites	Peach, nectarine, plum, apple, pear, fig
Mineral oil[4]	Insecticide and miticide	Hi-Yield Dormant Spray	Scale insects, mites	Peach, plum, apple, pear. Only labeled for dormant season application on fruit trees.
Myclobutanil	Fungicide	Eagle	Rusts (quince rust, cedar apple rust), powdery mildew, apple scab, brown rot and blossom blight	Peach, nectarine, plum, apple

Table 5. Fungicides, Bactericides, Insecticides and Miticides for Deciduous Fruit Trees in Home Orchards. (cont.)				
Permethrin	Insecticide	Bonide Eight Vegetable, Fruit, and Flower Concentrate	Plum curculio, June beetles, catfacing insects (tarnished plant bugs, stink bugs), aphids (not woolly apple aphid), leafhoppers, lesser peachtree borer, oriental fruit moth	Peach, apple (not after petal fall), pear
Pyraclostrobin, boscalid, lambda-cyhalothrin	Fungicide and insecticide	Bonide Fruit Tree and Plant Guard Concentrate	Brown rot, peach scab, apple scab, bitter rot, powdery mildew; plum curculio, June beetles, catfacing insects (plant bugs, stink bugs), aphids (not woolly apple aphid), leafhoppers, leafrollers, lesser peachtree borer, oriental fruit moth, apple maggot	Peach, nectarine, plum, apple, mayhaw, pear, quince
Spinosad	Insecticide	Bonide Captain Jack's Dead Bug Brew Concentrate, Fertilome Spinosad	oriental fruit moth and miscellaneous caterpillars, thrips	Peach, nectarine, plum, apple, mayhaw, pear, quince
Sulfur[4]	Fungicide	Bonide Sulfur Plant Fungicide	Peach scab, apple scab, pear scab, powdery mildew	Peach, nectarine, plum, apple, pear
Sulfur[4]	Fungicide	Hi-Yield Dusting Wettable Sulfur	Peach scab, apple scab, pear scab, powdery mildew	Peach, plum, apple, pear
Sulfur, pyrethrins[4]	Fungicide and insecticide	Captain Jack's Citrus, Fruit, and Nut Orchard Concentrate	Peach scab, apple scab, pear scab, powdery mildew; see note.	Peach, nectarine, plum, apple, pear. While pyrethrins are likely to have some efficacy against the same insects as synthetic pyrethroids (e.g., esfenvalerate, lambda-cyhalothrin, permethrin, zeta-cypermethrin), they degrade quickly and so have little residual activity.

Table 5. Fungicides, Bactericides, Insecticides and Miticides for Deciduous Fruit Trees in Home Orchards. (cont.)				
Streptomycin sulfate	Bactericide	Fertilome Fire Blight Spray	Fire blight	Apple, pear
Zeta-cypermethrin	Insecticide	Sevin Insect Killer Concentrate	Plum curculio, June beetles, catfacing insects (plant bugs, stink bugs), aphids (not woolly apple aphid), leafrollers, leafhoppers, peachtree borer, lesser peachtree borer, oriental fruit moth, apple maggot	Peach, nectarine, plum, apple, mayhaw, pear, quince

[1] Reference to trade names is made for the reader's convenience and with the understanding that no discrimination nor endorsement of a particular product is intended by LSU or the LSU AgCenter. In some cases, other brands may be available.

[2] Diseases and arthropod pests of special concern and/or on which the product is especially effective are noted. Products may have efficacy against other diseases or arthropods.

[3] Read product label for more information, including but not limited to allowed application and preharvest intervals. Follow label directions carefully. Labels may change, so make sure that the product is labeled for the type of plant to which you intend to apply it.

[4] Neither oil nor sulfur products should be used at excessively high temperatures, and oils should not be used at very low temperatures. Oil and sulfur or captan products generally should not be used within 14 days of each other. See labels for specific instructions.

Other publications available from the LSU AgCenter:

Louisiana Home Citrus Production, Pub. 1234
Figs for Commercial and Home Orchards in Louisiana, Pub. 1529
Blackberry Growing Guide, Pub. 1553
Home Blueberry Production in Louisiana, Pub. 1978
Best Management Practices for Louisiana-Grown Southern Highbush Blueberries, Pub. 3935
Louisiana Home Muscadine Production, Pub. 3856
Vegetable Gardening Tips: Strawberries, Pub. 3363
Louisiana Home Fruit and Nut Production, Pub. 3200 (for sale in LSU AgCenter Online Store)

Revision Authors

Mary Helen Ferguson, Extension Agent (Tangipahoa Parish)
Michael Polozola, Assistant Professor (Extension Fruit and Nut Specialist)

Historical Authors

John Pyzner, Associate Professor (Pecan Research and Extension Station, retired)
David Himelrick, Professor (School of Plant, Environmental and Soil Sciences, retired)
Don Ferrin, Assistant Professor (Department of Plant Pathology and Crop Physiology, deceased)

Acknowledgments

The authors wish to acknowledge the following individuals for their contributions to this publication:
Vincent Brown (Assistant Professor – Research, Department of Geography and Anthropology) and the Southern Climate Impacts Planning Program
Charles E. Johnson, Professor (School of Plant, Environmental and Soil Sciences, retired)
James Boudreaux, Professor (School of Plant, Environmental and Soil Sciences, retired)
Charles Graham, Associate Professor (Pecan Research and Extension Station, former employee)
Dale Pollet, Professor (Department of Entomology, retired)
Maddox Miller, Associate Extension Agent (Lafayette Parish)
William Afton, Extension Agent
Stuart Gautier, Extension Agent (St. Martin Parish)
Kerry Heafner, Associate Extension Agent (Ouachita Parish)
Jessie Hoover, Extension Agent (East Feliciana Parish)
Dondrea Thompson, Administrative Coordinator (Washington Parish)
Charlotte Humphries (Louisiana Master Gardner, Tangipahoa Parish)
Michael Clancy (Louisiana Master Gardener, Tangipahoa Parish)

Louisiana State University Agricultural Center

Issued in furtherance of Cooperative Extension Work, Acts of Congress of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. The Louisiana Cooperative Extension Service provides equal opportunities in programs and employment.

The material in the original publication was based upon work supported by the Cooperative State Research, Education and Extension Service, U.S. Department of Agriculture, under Award No. 2006-41210-03363. All opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

LSU AgCenter
Research · Extension · Teaching

Visit our website: www.LSUAgCenter.com

P1884 ONLINE 7/25 REV