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Many homeowners new to Texas ask which fruits they can grow and why the crops they grew back home aren't abundant here. This publication is designed to give homeowners a brief overview of the fruits that grow well in Texas and the problems that may be encountered with certain others. It is not intended to be an all-inclusive or commercial guide; instead, it is an introduction for homeowners interested in getting started in fruit gardening.

Home fruit culture can be a very demanding but very satisfying enterprise. In the following pages, you will find information on selecting the best varieties for your area, properly managing the trees and plants and controlling problems.

Selecting The Best Variety

The type of fruit or nut that you choose to grow may depend on several factors, such as the climate in your region of the state, the amount of care the plants require or simply your personal preferences. For each type of fruit or nut, you should choose the variety that is best suited to your needs and your area. The types of fruits that grow well in Texas, the varieties of each that are best adapted for different regions of the state and the management required are discussed below.

Apples

Apples are a popular fruit in much of Texas and, with proper variety selection, can be grown in all areas. Most varieties require cross-pollination, so, for maximum production, plant two varieties.

Fire blight can be a limiting factor for apples in East Texas; prune out any evidence of this disease as soon as it is spotted. In South, Central, North and West Texas, cotton root rot is the major cause of tree loss. Do not plant apples in spots where this disease has killed other plants.

When selecting trees, you can choose from three size categories: standard, semi-dwarf and dwarf. This refers to the rootstock used. Table 1, which presents a summary of management information for fruit crops, also lists apple rootstocks recommended in Texas; this table is found on page 8. Spur-type varieties are naturally small and probably should not be planted on full dwarf rootstocks.

Standard and semi-dwarf trees are best pruned to a central leader, while dwarf trees do well when trained along a fence or trellis.

Apples usually produce too many fruits per tree and require thinning. Thin to only one fruit (the largest) per cluster before the fruit reaches golf-ball size.

Blackberries

Blackberries are among the easiest of all small fruit crops to grow in Texas. They produce well on a wide variety of soils as long as drainage is good. Soils with a pH near or above 8.0 can cause serious problems with iron chlorosis. The yellowing and poor growth resulting from iron chlorosis is difficult to correct economically.

Plantings of Brazos blackberries have produced up to 1 gallon of berries per foot of row when properly managed. Realistically, plan for about 1 to 2 quarts per foot of row and plant accordingly.

Set either root cuttings or young plants 2 to 3 feet apart in a row. If you plant more than one row, space the rows 10 to 12 feet apart. The most productive varieties are erect and do not require a trellis or support.

Frequent watering is beneficial, especially to young plants. Water first-year plantings at least weekly through harvest. After harvest, some moisture stress is not harmful to a healthy planting.

Blackberries can usually be grown without an extensive pesticide program. Disease problems can be severe in portions of East and Southeast Texas. Plant blackberries far away from wild blackberries to minimize disease problems.

Blueberries

Proper soil, water and care are essential for successful blueberry growing. Blueberries require acid, sandy soils with a pH of 4.5 to 5.5. These soils occur extensively in East and Southeast Texas and in localized pockets in North, Central and South Texas. Blueberries also require good-quality water with low sodium and bicarbonates.
Blueberries thrive best in soils enriched with composted organic matter. Ideally, mix about 1/2 bushel of peat moss with the topsoil in the planting hole of each plant. If you are attempting to grow blueberries in soils with insufficient acidity, dig a hole at least 36 inches in diameter and 18 inches deep and mix at least 50 percent composted organic matter with the top soil. Blueberries thrive in 100 percent peat moss, so there is no limit to the amount you can use.

Calcareous or clay soils are almost impossible to modify sufficiently for blueberries. Blueberry enthusiasts with unsuitable soils should grow plants in tubs using a potting soil high in peat moss.

Plant at least two blueberry varieties to ensure adequate cross-pollination. The listed varieties are all of the rabbiteye type. Other types of blueberries are not well adapted to Texas.

Mulch plants heavily with organic material such as pine bark, sawdust, leaves, grass clippings, wood chips or hay. This aids in moisture conservation and weed control.

Blueberries are sensitive to over-fertilization. Spread fertilizer uniformly over the root area beneath and out from the plant. Use several small applications (1/8 to 1/4 cup per plant) during the spring and summer rather than a single large application. Avoid nitrate forms of nitrogen. Fertilizers formulated for azaleas work well.

**Chestnuts**

The Chinese chestnut is the only chestnut that is reasonably adapted to portions of Texas. This tree is tolerant to the chestnut blight that has killed most native American chestnuts throughout the eastern and central United States.

Chinese chestnuts grow best in the acid soils of East Texas and are poorly adapted to the extremely alkaline soils of portions of South, Central and West Texas.

Many of the Chinese chestnut trees purchased through nursery sources are seedling trees. Several grafted varieties, including Nanking, are also available. Plant Chinese chestnuts at least 30 feet apart. Care of chestnut trees is much the same as that of pecan trees. In the early years, prune the trees only enough to develop a single trunk and basic scaffolds. Excessive pruning delays the onset of bearing:

**Figs**

Figs are well adapted in most of Texas, but freeze damage often kills trees back partially. Because fruit are borne on new growth as well as 1-year-old wood, freeze-damaged trees usually are able to bear at least a partial crop.

To prevent the entry of insects and spoilage of the fruit, grow only closed-eye fig varieties.

Figs may be trained as trees or bushes. In colder portions of Texas where freeze injury is common, bush-training works best. Pruning is done basically to shape the plant, thin crowded branches and remove freeze-damaged wood.

**Grapes**

Grapes have long been popular in gardens and arbors throughout Texas. About half of all native species of grapes can be found in the state. Although grapes can make a great addition to a landscape, you must carefully consider several factors to choose a variety that will grow well in your area. These factors include:

- Freeze.
- Pierce’s disease (PD).
- Black rot.
- Cotton root rot.

Pierce’s Disease is a vine killer that is a threat in East and South Texas. Black rot affects both the foliage and the fruit and must be controlled with fungicide sprays when weather conditions are warm and humid. Cotton root rot is a soil fungal disease that kills vines very quickly. It is abundant in the alkaline soils of Central and Southwest Texas. Rootstocks resistant to cotton root rot, such as Dogridge, Champanel or 5 BB, should be used on these soils.

Varieties differ greatly in disease resistance, and your selection will be determined by your location in the state and your management program. The higher the quality of the grapes, the more intense your management program must be. Vinifera grapes are the highest quality, followed by French-American hybrids and then American types.

Muscadine grapes prefer acidic soils and have few limitations. American-type grapes such as Champanel, Black Spanish and Favorite are resistant to Pierce’s Disease. A few French-American hybrids have some resistance to black rot and mildew. Vinifera grapes are seriously affected by Pierce’s Disease, black rot, mildew and grape berry moth and are limited to West and North Texas. Vinifera grapes also require precise vine training and pruning for top-quality yield.

**Jujubes**

Jujubes are not well known but will thrive throughout Texas. Common names such as “Chinese date,” “date,” “Chinese apple” and “Chinese olive” are sometimes used. They bear their date-like fruits more consistently and abundantly in the arid West Texas climate.
Most native trees are upright and slender, often reaching 30 feet, with glossy, attractive leaves. Many of the trees found in Texas are seedlings. The trees are often thorny, although the most commonly available improved varieties, such as Li and Lang, are not thorny.

Trees can be planted as close as 15 feet apart. Root suckers can be a problem, so remove them as they appear. The trees are hardy and drought- and pest-tolerant.

The fruit ripen in late summer to early fall. The fruits of the larger varieties, such as Lang, are as large as 2 inches in length and 1 1/2 inches in diameter. The fruit can be eaten fresh while the peel is still slightly green. Mature fruit can be left on the tree to turn brown and dry naturally. The dried fruit are used in much the same way as the true date.

**Loquats**

The loquat is an attractive evergreen tree that is adapted to much of Central, East, West and South Texas. Winter tree damage is a problem in the northern portions of Texas that experience winter temperatures below 10°F. Fruit are set in the fall and mature in the spring. Winter temperatures below 25°F usually destroy the fruit, so consistent fruit production is limited to the extreme southern portions of the state.

**Peaches, Nectarines And Plums (Stone Fruits)**

Because of the many insects and diseases that attack stone fruit trees, they are relatively short-lived and should not be planted as specimen trees in an attractive part of the landscape. With care, however, these trees can produce bountiful crops of delicious fruit.

Adapted varieties usually set good crops, but early bloom makes all stone fruits highly subject to crop damage from spring freezes. Insect and disease problems on the fruit usually require control measures to produce edible fruit.

Careful variety selection is necessary. Non-adapted varieties lead to poor production and disappointment. See Figure 2 on page 7 for information on the varieties best adapted to your area.

Pruning and thinning are required for healthy trees and for the consistent production of large fruit. Pruning encourages the vigorous growth required for annual production and keeps trees manageable. Prune stone fruit trees to an open center (see the Training and Pruning section on page 11). Thin by hand about the time small fruits are the diameter of a dime. After thinning, the fruits should be at least 6 inches apart on peaches and nectarines and 3 inches apart on smaller plum varieties.

**Pears**

Fire blight, a bacterial disease that kills leaves, branches and sometimes whole trees, is the chief limiting factor to growing pears in Texas. Pears are also readily killed by cotton root rot. Other disease and insect problems are usually not severe enough to require a regular pest control program.

Do not attempt to grow popular varieties such as Bartlett because of their extreme vulnerability to fire blight. Plant only blight-resistant varieties in Texas. Plant at least two pear varieties to ensure good fruit set.

Asian pears are attracting considerable attention because of their high-quality fruit. They are characterized by apple-like shapes on certain varieties and an apple-like texture with a pear flavor. These varieties are reasonably well-adapted in Texas.

Follow the central leader system in training and pruning pear trees. (See the Training and Pruning section on page 12.)

**Pecans**

The pecan, which is the state tree, is native to some 150 counties. It is popular for its aesthetic value in the landscape as well as for the tasty nuts it yields in the fall. But, despite their appeal, pecans are not “care-free” trees.

Even with the limitations of soil requirements, the need for regular zinc spraying and their numerous insect and disease pests, pecans are universally adapted to the home landscape. Pecans grow best in deep, well-drained soil. They do not tolerate “wet feet,” or poor drainage. All pecan varieties require cross pollination; however, in most cases, sufficient pollen is available. If your trees will be isolated, check on pollination before selecting varieties.

There are hundreds of named varieties and literally millions of unnamed varieties, since pecans do not “come true” from seed. Every native or seedling pecan tree is a separate and distinct variety. Seedling (ungrafted, grown from seed) trees make very good landscape trees. The nut quality for seedling trees is variable but often good. If grown under minimal landscape management, seedling trees do better than improved varieties. To maintain healthy trees, improved varieties usually require zinc, nitrogen, water and pest management.

Plant pecan trees at least 35 feet apart in the home landscape and at least 20 feet from major buildings and property lines. Cut the trees back by half at planting. Train them to a “central leader” with a single central trunk and wide-angle branches. (See the Training and Pruning section on page 12.)
Persimmons

Native persimmons are common in most of Texas, but gardeners usually prefer to grow varieties of the large-fruited, attractive Japanese persimmons. Available Japanese persimmon varieties have fruit ranging from red to orange in color and from flat to conical in shape. Most are astringent (sharp and puckering) if eaten before they are soft-ripe, but the Fuyu (Fuyugaki) and several other varieties become non-astringent and can be eaten while the fruit are still firm. Fuyu is more sensitive to cold temperatures than other varieties.

Most Japanese persimmon varieties are compact and upright, and trees can be planted as close as 10 feet apart. Train persimmon trees to a central leader (see the Training and Pruning section on page 12). Very little pruning is needed.

Insect and disease pests are not usually a serious problem. Premature fruit drops often occur on trees that are experiencing severe soil moisture fluctuations, so provide regular deep irrigations if fruit drop is a problem.

Fertilize moderately with a balanced fertilizer in February and June.

Pistachios

The nut-bearing pistachio is best adapted to the more arid portions of West and Central Texas. Disease pressures make success difficult in East Texas and in coastal areas. Pistillate (female) and staminate (male) flowers are produced on separate trees. Plant at least one male for every 10 female trees.

The Kerman (female) and Peters (male) varieties are by far the most common. Pistachio trees are difficult to obtain in Texas because most propagating nurseries are in California, and the trees are generally started in containers, making them more expensive to ship. Nurseries can order trees if they don’t already carry them.

Pistachio trees are relatively small at maturity and can be planted as close as 15 to 20 feet apart. They usually begin to bear 4 to 5 years after planting. The nuts mature in the fall.

Pomegranates

Pomegranates, attractive as bushy shrubs or small trees, are reasonably well-adapted. Fruit quality varies widely among those grown ornamentally.

Wonderful is the only variety with good fruit quality that is commonly available from nurseries in Texas. This variety has large, glossy, deep purple-red fruit. The kernels and juice are crimson with good flavor; the seeds are small and tender; and the rind is of medium thickness. The fruit is eaten fresh or processed.

Raspberries

Raspberries are not well adapted to Texas conditions. However, with effort and care, you can produce sufficient quantities from a few feet of row to satisfy your taste for this fruit.

Avoid calcareous and heavy clay soils when planting raspberries because they do poorly on these sites. The best-adapted raspberries are trailing and require support for the vines, so plant them beside a fence or a trellis.

Frequent watering and mulch are necessary to attain any degree of success. Mulch with 4 to 6 inches of sawdust, hay, leaves, bark or other organic media. This keeps the plants’ roots and crowns cool and moist for longer periods.

Strawberries

While strawberries can be grown for several years, they perform best in Texas when grown as an annual plant. This production system eliminates the need to carry plants through the ravages of summer.

Spring-bearing varieties are the best adapted for most regions of Texas. Ever-bearing strawberry varieties do not fruit well under hot summer conditions.

Fall Planting System. In South Texas, plant annual strawberries from late September to the first week of October. They require a great deal of care; do not allow them to dry out. In this system, set plants in double rows 12 inches apart and 42 inches wide. After harvest the following spring, plants are usually destroyed. In North and West Texas, annual planting is done in late winter or spring. Production is greatest the next spring, 1 full year after planting.

In areas where the soil is saline or contains too much clay, construct a raised bed about 10 inches deep. Fill with loose, pliable, well-drained soil.

Spring Planting System. Set plants 18 inches apart in a single row. Runners set through the summer develop a matted row. The primary crop is harvested in the spring, 1 year after planting.

Tropical And Subtropical Fruits

Tropical and subtropical fruits, such as citrus, avocado, mango, banana, and papaya, are extremely sensitive to cold weather, which limits their planting to mostly coastal and deep South Texas, unless you take special precautions for freeze protection. Of these fruits, citrus has a greater range of cold-hardiness, with some types capable of surviving temperatures in the high teens. Some seedling Mexican-race avocados have survived in colder areas of South Texas, but the quality of those types is not particularly good.
Because mango and papaya are extremely cold-sensitive, with extensive damage occurring at freezing temperatures, they are limited mostly to the Lower Rio Grande Valley. Even without freezing, mango fails to flower or set fruit at temperatures under 40°F during bloom formation.

Bananas freeze readily, but the underground portions survive most South Texas winters and regenerate plants the following spring. To bear fruit, though, bananas require a frost-free winter.

Except for citrus, few varieties of the different tropical fruits are available in Texas nurseries.

Papaya can be severely debilitated by virus diseases, but there are no major insect or disease problems with most of the tropical fruits in South Texas. The major disease of citrus is foot rot, which can kill the tree.

For further information about these fruits and their varieties, refer to Texas Agricultural Extension Service publication B-1629, “Home Fruit Production—Citrus.”

**Walnuts**

Black walnuts and carpathian (English) walnuts are climatically adapted to essentially all parts of Texas. Several species of black walnuts thrive as natives in Texas. They are of little value as nuts because of their thick, hard shells. Improved black walnut varieties such as Thomas are commonly propagated and sold through nursery sources.

The acid and neutral-pH soils of East and North Texas are suitable for carpathian walnuts, but common rootstocks used for carpathians do poorly in the extremely alkaline soils of South, Central and West Texas. Carpathians thrive in western portions of Texas if they are grafted onto the native Central and West black walnuts *Juglans microcarpa* (Texas black walnut) or *Juglans major* (Arizona black walnut). Very few nurseries propagate these native black walnuts as rootstocks, so this is usually a “do-it-yourself” project.

Carpathian walnut trees are smaller than pecans and can be planted as close as 30 feet apart. Care of walnut trees is much the same as that of pecan trees.

Walnut blight is the most serious problem with carpathian walnuts. Disease pressures are greatest in East Texas and coastal areas. Walnut blight can infect young nutlets during the bloom period and as the nuts approach maturity. Plant blight-resistant varieties (Reda or Hansen) in more humid areas. Sprays may be needed in wet years to reduce disease problems.

**Problem Types**

Catalogs paint pretty pictures that tempt us to try at least one of everything, but not all fruits and nuts are adapted to all parts of Texas, and some are not adapted at all. Reasons for poor adaptation vary from temperature-related problems to humidity and disease limitations. Some of the more notable fruit and nut crops that have problems in some areas are discussed below.

**Almonds.** The trees are well adapted, but they do not fruit in most of the state. Bacterial leaf spot also causes early leaf drop.

**Apricots.** The trees are well adapted to all areas except extreme South Texas; however, fruiting is inconsistent in much of the state. Poor fruit set is often blamed on freeze damage from early bloom and on self-unfruitfulness of varieties, but apricots usually bloom no earlier than peaches and essentially all varieties are self-fruitful. Fruit set is more consistent in arid West Texas than in central and eastern portions of the state.

**Cherries.** Most of Texas lacks sufficient winter chilling needed to produce a normal bloom. Sour cherry varieties, such as Montmorency, bear with fair consistency in North Texas. Sweet cherry varieties are winter-killed because of fluctuating temperatures and are unadapted to all of Texas.

**Filberts.** The filbert (hazelnut) tree will grow in Texas, but nut production is generally poor. The tree does well on a wide variety of soils, ranging from acidic to highly calcareous.

**Gooseberries and Currants.** These berries will not tolerate our hot Texas summers and are seldom fruited here.

**Kiwifruits.** Kiwifruit has proven to be difficult to grow in Texas. The major limitations include susceptibility to freeze injury, only fair heat tolerance and poor wind tolerance. A separate species of kiwifruit with much greater cold tolerance is being promoted in garden catalogs. It has a smaller, less-desirable fruit than commercially available kiwifruit and is poorly adapted to hot Texas summers.

**Macadamias.** Macadamia nut trees are tropical, and most types cannot withstand temperatures below 25°F. Hardiness varies according to species, and certain types are reported to tolerate much colder temperatures. Test results of macadamias in Texas are not known.
Consider Climate In Choosing Varieties

The climate, more than any other factor, determines whether a particular fruit or nut variety will be successful in any part of Texas. The state has widely diverse climates, ranging from sub-tropical Brownsville to the cold Panhandle, and rainfall of 60 inches or more in East Texas to the desert-like climate of West Texas. Most, but not all, fruit crops can be successfully grown in some areas of Texas.

Winter Temperatures

Winter temperatures dictate where plants will grow because of chilling requirements and winter minimums. The chilling requirement is the number of hours between 32°F and 45°F required before a plant starts normal growth in the spring.

Chilling units in Texas vary from 100 hours or fewer in the southern tip of Texas to more than 1,000 hours in the Panhandle. If plants requiring many hours of chilling are planted too far south, they will not bloom and grow normally in the spring. Conversely, if a low-chilling plant is set too far north, its requirement will be satisfied early and any warm weather will cause early bloom and probable freeze damage to both the crop and the tree.

Minimum temperatures also dictate plant selection since many fruiting plants freeze at relatively high temperatures. Bananas, for example, are damaged at 32°F, while apples can sustain temperatures of 0°F without damage if they are dormant.

Rainfall

Rainfall and accompanying high humidities also play an important role in plant selection. Irrigation can supplement rainfall, but water quality is critical for plants such as blueberries. High humidities in East and Central Texas increase disease pressures; therefore, in these areas use recommended resistant varieties.

The maps in Figures 1, 2 and 3 show zones of adaptation for various fruits and nuts in the state of Texas. The varieties listed are those that are best adapted to a specific area. By choosing only recommended varieties, a homeowner has a much greater chance of success. Some overlap of zones is inevitable; however, those listed within zones are most likely to have annual production.

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**Blackberries**
- Zones 1-2: Brazos, Rosborough, Womack, Brison, Cheyenne, Shawnee, Hull
- Zones 3-4: Brazos, Rosborough, Womack, Brison

**Blueberries**
- Zone 2: Tifblue, Woodard, Delite, Briteblue, Climax, Premiere, Brightwell
- Zone 4: Climax, Sharpblue, Beckyblue, Tifblue, Woodard, Premier, Brightwell

**Red Raspberries**
- Zones 1-4: Dorman Red

**Strawberries**
- Zones 1-2: Sunrise, Cardinal, Allstar
- Zones 3-4: Sequoia, Douglas, Chandler, Tioga, Fresno, Tangi
- Zones 5-6: Sequoia, Douglas, Tioga

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Figure 1. Zones of adaptation for berry varieties commonly grown in Texas.
Peaches
Zone 1: Springgold, Bicentennial, Surecrop, Sentinel, Ranger, Red Globe, Denman, Milam, Jefferson, Belle of Georgia, White Star
Zones 2-3: Springgold, Bicentennial, Sentinel, Ranger, Harvester, Red Globe, Milam, Denman, Loring, Dixiland, Redskin, Jefferson, Surecrop, Belle of Georgia
Zone 4: Springgold, Bicentennial, June Gold, Sentinel, Harvester, Red Globe, Summerrgold, Loring, Milam, Dixiland, Redskin, Jefferson, Belba, Palace, White Hale
Zone 5: Bicentennial, June Gold, Rio Grande, Idlewild, Texstar, TexRoyal, Harvester, La Feliciana, Loring, Dixiland, Redskin, Melba, Palace, White Hale
Zone 6: EarlirGande, FloridaGrande, Florida King, June Gold, La Feliciana, Texstar, Floridaglo, Starlile
Zone 7: EarlirGande, Tropic Beauty, Tropic Sweet, Floridaprinse, FloridaGrande, TropicSnow, Floridaglo

Figs
Zones 1-3: Texas Everbearing, Celeste
Zones 4-5: Texas Everbearing, Celeste, Alma
Zones 6-7: Celeste, Alma

Apricots
Zones 1-3: Bryan, Hungarian, Moorpark
Zones 4-6: Bleinheim, Royal

Persimmons
Zone 2: Eureka, Hachiya
Zones 3-6: Fuyu (Fuyugaki)
Zone 7: Tanenashi, Tamopan

Nectarines
Zones 1-3: Redglobe
Zones 1-5: Armking, Crimson Gold
Zones 6-7: Sun Red

Plums
Zones 1-3: Morris, Methley, Ozark, Premier, Bruce, Allred
Zones 4-6: Methley, Allred, Bruce
Zones 6-7: Gulfruby, Gulfgold

Jujubes
All Zones: Li, Lang

Pomegranates
All Zones: Wonderful

Pears
Zone 1: Orient, Moonglow, Ayers, Kieffer, Surecrop, Maxine, LeConte, Ayers, Magness
Zones 2-4: Orient, Moonglow, Kieffer, LeConte, Ayers, Garber, Maxine
Zones 5-6: Orient, Kieffer, LeConte, Monterrey, Fanstil, Pineapple, Garber

Loquats
Zones 4-6: Ornamental
Zone 7: Fruit Production

Apples
Zone 1: Starkspur G. D., Red Chief, Starkrimson R. D., Smoothee, Top Red, Prime Gold, Jerseymac, Granny Smith, Gala
Zone 2: Top Red, Red Chief, Starkrimson R.D., Starkspur G. D., Smoothee, Prime Gold, Jerseymac, Mollie's Delicious, Granny Smith
Zone 3: Jerseymac, Gala, Starkspur G. D., Starkrimson R. D., Mollie's Delicious, Ozark Gold
Zone 4: Jerseymac, Gala, Mollie's Delicious, Starkrimson R.D., Granny Smith
Zone 5: Ein Sheimer, Anna, Dorsett Gold, Mollie's Delicious, Gala
Zones 6-7: Ein Sheimer, Dorsett Gold, Anna

Figure 2. Zones of adaptation for fruit varieties commonly grown in Texas.
Pecans
Zone 1: Mohaw, Shoshoni, Cheyenne, Pawnee, Merrimac
Zone 2: Wichita, Western, Cheyenne, Tejas, Mohawk
Zones 3-5: Kiowa, Choctaw, Cheyenne, Wichita, Western, Caddo, Sioux, Desirable
Zones 4-7: Desirable, Choctaw, Cheyenne, Shawnee, Kiowa, Caddo, Cape Fear, Sioux

Walnuts
All Zones: Reda, Fately, Hansen, Broadview

Pistachios
Zones 1-5: Kerman (female), Peters (male)

Chestnuts
Zones 1-3: Nanking, Seedlings, Revival

Grapes
Zones 1-3: Hybrid, Vinifera, American
Zone 2: Vinifera only
Zone 5: American
Zones 4-7: American, Mars, Orlando, Muscadine

Figure 3. Zones of adaptation for nut and grape varieties commonly grown in Texas.

Managing Fruit Trees In The Home Landscape

Table 1 presents a summary of management requirements for the fruits and nuts most commonly grown in Texas. These requirements are discussed in detail in the following pages.

Table 1. Recommended Planting Distances, Time To Fruit, Pollination Requirements And Pruning Systems For Texas Fruit Crops.

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Spacing between plants</th>
<th>Years to first fruit</th>
<th>Pollination requirements</th>
<th>Pruning system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seedlings</td>
<td>25 ft.</td>
<td>5</td>
<td>Cross^2</td>
<td>Central leader</td>
</tr>
<tr>
<td>MM111 RS^1</td>
<td>20 ft.</td>
<td>4</td>
<td>Cross</td>
<td>Trellis</td>
</tr>
<tr>
<td>MM106 RS^1</td>
<td>14 ft.</td>
<td>4</td>
<td>Cross</td>
<td>Open center</td>
</tr>
<tr>
<td>M9 RS^1</td>
<td>10 ft.</td>
<td>3</td>
<td>Self^1</td>
<td>Remove old canes and top new canes</td>
</tr>
<tr>
<td>Apricots</td>
<td>18 ft.</td>
<td>4</td>
<td>Self</td>
<td>Thin center</td>
</tr>
<tr>
<td>Blackberries</td>
<td>3 ft.</td>
<td>1</td>
<td>Self</td>
<td>Maintenance</td>
</tr>
<tr>
<td>Blueberries</td>
<td>6 ft.</td>
<td>1-2</td>
<td>Cross</td>
<td>Bush or central leader</td>
</tr>
<tr>
<td>Citrus</td>
<td>20-25 ft.</td>
<td>2-3</td>
<td>Most self</td>
<td>Cane or spur</td>
</tr>
<tr>
<td>Figs</td>
<td>12 ft.</td>
<td>2</td>
<td>Self</td>
<td>Spur</td>
</tr>
<tr>
<td>Grapes, bunch</td>
<td>4-8 ft.</td>
<td>2-3</td>
<td>Self</td>
<td>Open center</td>
</tr>
<tr>
<td>Grapes, muscadine</td>
<td>10-20 ft.</td>
<td>2-3</td>
<td>Self and cross</td>
<td>Central leader</td>
</tr>
<tr>
<td>Peaches</td>
<td>18 ft.</td>
<td>3</td>
<td>Self</td>
<td>Central leader</td>
</tr>
<tr>
<td>Pears</td>
<td>25 ft.</td>
<td>5</td>
<td>Cross</td>
<td>Open center</td>
</tr>
<tr>
<td>Pecans</td>
<td>40 ft.</td>
<td>4-7</td>
<td>Cross</td>
<td>Central leader</td>
</tr>
<tr>
<td>Plums</td>
<td>18 ft.</td>
<td>3</td>
<td>Cross</td>
<td>Open center</td>
</tr>
<tr>
<td>Strawberries</td>
<td>1 ft.</td>
<td>3 months</td>
<td>Self</td>
<td>Annual planting</td>
</tr>
</tbody>
</table>

^1RS = Rootstock
^2Cross: At least two different varieties needed for fruiting
^3Self: Self-fruitful
Propagation

One of the most common questions among home gardeners is how various fruit and nut crops are propagated. Table 2 summarizes the most popular methods of propagation for Texas crops.

### Table 2. Propagation Methods For Texas Fruits And Nuts.

<table>
<thead>
<tr>
<th>Plant</th>
<th>Budding, grafting</th>
<th>Cutting, layering, suckering</th>
<th>Seedage</th>
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<tr>
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<tr>
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<td>Whip graft, bark graft, chip bud, T-bud</td>
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<td>Root cutting, softwood cutting,</td>
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<td>Blackberries</td>
<td></td>
<td>simple layering, suckers</td>
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<tr>
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<td>Hardwood cutting, air layering</td>
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<td>Whip graft, T-bud, chip bud, crown cleft, bark graft</td>
<td>Softwood cutting, simple layering</td>
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<td>mound layering</td>
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<td>Papayas</td>
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1Preferred or most common method is shown in boldface.  
2Primarily used in top-working, established trees.  
3Also used in top-working, established trees.  
4Remove seeds from pit.
Plant Nutrition

Under natural conditions, plant nutrition is usually not a problem because slow growth and low production are acceptable. But the homeowner usually wants many large fruits as soon as possible, so a judicious fertility program is necessary.

When buying a fertilizer, it is important to know what the numbers mean. A fertilizer label usually has three numbers, such as 10-10-10. These numbers represent the percentages of nitrogen, phosphorus and potassium, respectively, in the mix. In other words, a 50-pound bag of 10-10-10 has 5 pounds each of N, P₂O₅ and K₂O. But that accounts for only 15 pounds out of a 50-pound bag. The rest is either other salts or inert fillers, such as sand, perlite or other materials.

Nitrogen. Nitrogen is necessary for all vegetative growth—roots, leaves, stems, flowers and fruit. Nitrogen deficiency causes the plant’s lower leaves to turn yellow, while excessive amounts delay maturity, causing increased vegetative growth and decreasing cold-hardiness. Nitrogen is needed in all parts of Texas to maintain healthy plants.

Phosphorus. A long-standing fertility recommendation has been to apply a high-phosphorus fertilizer anytime a plant fails to bear. However, in most situations, phosphorus does not increase blooming in a fruiting plant. Phosphorus fertilization is needed most in sandy soils, since clays and loams ordinarily have adequate amounts for perennial plants.

Potassium. The role of potassium has not been well defined, but it is known to be one of the major elements in plant nutrition. Potassium deficiencies vary, but stunted growth, dark or purple discoloration and leaf margin death are common symptoms in many plants. Most clay and loam soils in Texas have an adequate supply of potassium, so additional amounts are not required. Most of the sandy soils require potassium fertilization to maintain healthy plants.

Iron. Many areas have problems with iron deficiency even though adequate amounts are present in most Texas soils. The alkaline (pH over 7.0) soils tie up iron, making it unavailable to the plants. Iron deficiency is normally found in new growth and is characterized by yellow leaves with a “road map” appearance because almost all the veins remain green.

Zinc. Zinc deficiencies are a problem in pecans in most of the state. Zinc deficiencies are characterized by small leaves, rosetted (highly branched, short, bunchy) growth, twig and limb dieback and sometimes tree death. Leaf veins have a band of green on each side, giving the leaves a striped appearance.

Choosing A Fertilizer

Because Texas has such variability in its soil types, a single broad fertilizer recommendation is not applicable in all cases. The best means of determining your individual soil needs is to have a soil test done by the Texas Agricultural Extension Service’s Soil Testing Laboratory. Information on sampling techniques and prices is available from your county Extension office.

Where soil tests are unavailable and a general recommendation is needed, use the following guidelines. On sandy soils, use a complete fertilizer such as 15-5-10 for most fruit crops. Acceptable rates are 1 pound per inch of trunk diameter per year of age for trees up to 10 years old and 1 pound per 10 feet of row for blackberries and grapes.

On loams and on clay soils, the only element generally required is nitrogen, which can be furnished with 1 pound of 21-0-0 per year of age or inch of trunk diameter up to 10 for trees or 1 pound per 100 feet of row for vine crops.

Iron deficiencies are common on most of the alkaline soils in Central, South and West Texas. Generally foliar iron sprays do not work well to correct iron deficiencies in fruit crops. Soil-applied iron chelates (FeEDDHA) at label rates are the most effective. Iron sulfate (copperas) is seldom effective as a remedy for iron chlorosis of fruit trees or berries. Where iron deficiencies are a problem, do not use fertilizers containing phosphorus, as they usually make the problem worse.

Zinc deficiency on pecans is a problem in most of Texas; therefore, make at least three applications of a foliar zinc spray each year during April and May for maximum growth. Do not spray other plants with zinc at the rates used on pecans since leaf burn and defoliation may occur. Zinc nitrate is least likely to cause burn to other plants in the landscape. When zinc deficiency is a problem on other crops, it can usually be corrected by soil applications of zinc sulfate.

Water Requirements

To maximize production and maintain plant health, it is important to irrigate plants through periods of stress. There are many ways of determining when and how much to irrigate. Begin watering when the soil begins to dry out after a rain. If your area experiences prolonged wet periods, wait about 2 weeks before starting.
It is important that you apply enough water to wet the soil to a depth of at least 12 inches with each irrigation. You can check the irrigation depth by pushing a metal rod into the soil at the wetted area. Keep pushing until resistance stops the rod’s penetration: the length of the underground portion of the rod is the irrigation depth. When the soil is wetted to a depth of 12 to 18 inches at each watering, plants usually do not suffer from drought stress, even when waterings are missed.

In areas where the lawn is not watered, trees still require water. You can provide water in a number of ways, but trickle or drip irrigation is one of the best methods. Trickle irrigation kits for lawn and garden use are readily available. When using drip irrigation, place enough emitters around the plants to water 50 to 70 percent of the root system. During hotter months of the growing season, operate drip systems a minimum of 10 to 12 hours, 1 day per week, to maintain adequate soil moisture. They can be controlled by electric time clock, by switching tensiometer or by hand.

**Training And Pruning**

Training and pruning are essential parts of the management program for any fruit or nut crop. Training the plants helps to ensure that they will grow properly and bear successfully—and that they will be attractive additions to your landscape.

**Tree Training Systems.** The two most commonly used tree training systems are the open center and the central leader systems. Open center systems are generally used on peaches, plums, apricots and almonds. Apples, pears, pecans and persimmons are normally trained to a central leader. There are good and bad points to both systems, but neither system dictates that the trees be pruned a certain way. In fact, many trees are not pruned or trained at all. However, contrary to some popular beliefs, pruning is important for producing most fruit and nut crops. But don’t get bogged down in specifics; instead, keep general principles in mind.

Both training systems start out in essentially the same way. Fruit trees that are 30 to 36 inches tall or larger, or nut trees 4 to 7 feet tall, are cut back by one-half at planting with all side shoots removed (Figure 4). This forces out strong vigorous shoots which can be easily trained to the desired system.

**Figure 4. Remove all side shoots at planting.**

**The open center or vase system** of training simply involves maintaining a framework of branches around an open “vase” in the middle of the tree. This allows sunlight to penetrate into all parts of the tree, allowing for good production in all areas.

The key to open system training is to develop a strong open center framework in the first 2 or 3 years (Figure 5) and to subsequently maintain this shape (Figure 6). This later pruning involves the heading-back of shoot terminals to outward-growing branches, the removal of large, fast-growing branches that fill the open center and the removal of crowded branches and any diseased or broken limbs. This reduces the height and keeps the center of the tree open.

**Figure 5. Open system training involves developing a strong open center framework in the first 2 or 3 years.**
The central leader system consists of a central trunk around which scaffolds (primarily side branches) of the desired number and spacing can be arranged with wide-angle crotches. Three to eight scaffold branches are commonly developed from the central leader trunk.

A "modified" central leader tree is cut back each winter and a new central leader shoot is selected each spring. Pecans, apples and pears are generally pruned in this manner (Figure 7). The top center of modified central leader trees is often thinned out for better light penetration into the interior of the tree canopy. Uniformly space the scaffolds around the central leader.

Grape Training. Grapes require severe pruning to develop high shoot vigor during training and to maintain production of quality berries on mature vines. Prune back leaving only two buds at planting, as shown in Figure 8.

First growing season: Allow growth to develop at random to establish a good root system.

First winter: Prune off all growth except one shoot with two good buds, as shown in Figure 9.

Second growing season: Choose the most vigorous shoot and train it up a stake. Tie the vine to the stake every 6 inches. Keep side shoots pinched off, but keep leaves on the trunk. When the shoot reaches just above the cordon wire, pinch out the tip to force lateral branching. Train laterals (arms or cordons) down the wires, tying regularly to keep the cordon straight and in place. See Figure 10.

Further information for pruning specific crops is available in these Texas Agricultural Extension Service publications:

B-1591, "Home Fruit Production—Figs."
B-1598, "Home Fruit Production—Pears."
B-1607, "Home Fruit Production—Apples."
B-1629, "Home Fruit Production—Citrus."

Figure 6. The shape of the open system must be maintained throughout the life of the tree.

Figure 7. Central leader pruning is generally used for pecans, apples and pears. A central trunk supports scaffold branches with wide-angle crotches.

Figure 8. Prune severely at planting to only two buds.

Figure 9. Prune off all growth except the main shoot with two buds during the first winter.
Train the most vigorous shoot to a stake during the second growing season, tying every 6 inches. Cut the trunk shoot above the low (42-inch) wire to force lateral shoots to grow near this wire.

**Mature vines:** Cane pruning and cordon pruning are two basic systems commonly used. With either system, winter-prune the vine, leaving a total of about eight buds of the previous summer’s growth prior to the third year and 20 to 40 buds per vine on mature vines.

**Cane pruning** is best for varieties that produce few fruit on basal buds such as Thompson seedless and for small clustered varieties. With this system, all four arms are removed each winter. One-year shoots (renewal canes) are tied to the wires to replace the old arms. Cut off the tip of each renewal cane at a point where it is approximately 3/8 inch in diameter. See Figure 11.

**Cordon pruning** is most commonly used in Texas vineyards. This system consists of leaving about seven upright spurs (one to two buds per spur) on each cordon, as shown in Figure 12. All other growth is removed. Use a “clothesline-like” T-top trellis with a wire at each end to more efficiently catch and spread the upright cane growth. For this method, a 2-foot wire T-top replaces the single top wire shown.

**Muscadine grapes** are usually cordon-trained, but because of greater vine vigor, muscadine vines can be allowed to support up to four cordons with spurs of three to five buds each, as shown in Figure 13.

**Grape arbors** are easiest to maintain using cordon training. Develop parallel, spur-pruned cordons about 2 feet apart across the top of the arbor. Black Spanish and Champanel are excellent arbor varieties. Muscadines also make good arbor grapes in East Texas.

**Berry Training.** The types of blackberries and raspberries range from erect, freestanding plants to trailing vines. The training systems differ according to the type of growth.

**Erect blackberries and raspberries** produce low, sprawling growth the first year after planting, but in the second and subsequent years new growth is very erect. Clip the tips from new canes two to three times
from May to September to force side-branching and to develop a full, compact hedgerow, as shown in Figure 14. Prune the hedgerow much as you would an ornamental hedge. A well-pruned hedgerow of erect berries does not need trellis support.

Figure 14. Clip berry plant tips to develop a compact hedgerow.

Fruiting canes die soon after the fruit have matured. An accumulation of dead canes poses a considerable nuisance when picking berries, so it is best to keep dead canes removed.

Winter pruning is not needed if the berries are properly pruned in the summer.

**Trailing and semi-erect blackberries and raspberries** should be trellised, as shown in Figure 15. A proper trellis allows the canes to be spread for good sunlight exposure.

Figure 15. Trailing and semi-erect berries should be trellised for good sunlight exposure.

Tip new canes two or three times each summer to encourage more branched growth. Leave new canes (primocanes) of trailing blackberries on the ground each winter to help protect them from freeze damage. Trellis the canes before they begin growth in mid-March. Remove and destroy fruiting canes (floricanes) after harvest in the summer as soon as they die.

**Harvesting**

"Mature" and "ripe" are not synonymous terms when applied to most fruits. Mature fruit have all of the internal components necessary to fully ripen even if they are picked before they are ready to eat. But a ripe fruit is at the point at which it is ready to eat. Many fruits, including peaches, reach maturity while still hard, several days before they ripen.

Harvesting fruit at proper maturity and storing it under proper conditions can be just as important as a good spray program. Immature fruit lacks characteristic flavor and texture, while over-ripe fruit is usually mealy with rapid tissue breakdown and does not hold up in storage.

Where ripening characteristics are concerned, fruits fall into three categories:

- Those picked green-mature for storage, but whose flavor is not as good as that of fruits that reach full maturity on the tree (such as peaches, nectarines and plums).
- Those picked and ripened in storage, whose flavor is as good or better than tree-ripened (including avocados and bananas, which mature on the tree but do not reach peak flavor until picked and held for 4 to 5 days at room temperature).
- Those fruits that must ripen on the tree or vine (such as grapes, blackberries and citrus).

Besides fruit maturity, other important points to consider are proper handling and storage. The fruit's skin or peel provides a natural barrier to insects and diseases; therefore, gentle handling to prevent punctures and bruises is essential. Discard any diseased or bruised fruit or use it immediately. Proper storage is a real key to maintaining fruit quality. Fully ripe fruits store best at refrigerator temperatures.
Fruit and nut crops are susceptible to a variety of different insects, diseases and weeds. Some of these problems damage the plants themselves, while others attack the fruits or nuts, leaving them unattractive and inedible. Successful control of these problems requires careful monitoring of your plants and a program combining management practices and chemical controls.

**Insects**

More than 100 species of insects attack the home garden and orchard. Most are only occasional pests, but many are commonly found feeding on vegetables and fruit.

Many insect pests attack the foliage; others may feed on plant roots or on the fruit. Many pests can build up high numbers rapidly, causing extensive damage quickly. If not controlled, some insects can destroy an entire crop, while others can destroy the trees. Learn to identify which bugs require treatment and which are “good bugs.”

**Scale Insects.** White peach scale and San Jose scale are two serious pests of trees. These pests attach themselves to the limbs and suck out plant sap. Heavy infestations may kill limbs or even entire trees in the dormant season.

**Plum Curculio.** The plum curculio is a devastating pest of peaches and plums. The adult is a weevil. The female weevils lay eggs in the fruit, and the larvae feed on the developing fruit. Small fruit will fall off the tree, and larger fruit will be ruined by the feeding of larvae inside. To control this pest, apply insecticides first when petals begin to fall off the newly pollinated fruit. Make additional applications at the shuck split stage and then at 2-week intervals to include three more applications.

**Catfacing Insects.** “Catfacing” is a term used to describe damage to fruit which causes them to be deformed and pitted. Catfacing is caused by insects feeding on growing fruit. These pests include stink bugs, leaf-footed bugs, green June beetles and others. Use control measures when these pests are observed.

**Peach Tree Borers.** The peach tree borer is the larval stage of a moth. The larvae bore into peach or plum trees close to the ground level. Heavily infested trees may be girdled, which will kill the trees. This pest is controlled in mid- to late August. For best results, thoroughly cover the trunk with insecticide.

**Major Pecan Pests**

Pecans are extremely vulnerable to insect pests. Major pecan pests can be divided into two groups—those that feed on foliage and those that feed on nuts. The timing of pesticide applications is extremely important if pecans are to be protected from these pests.

**Scale Insects.** Obscure scale can cause severe damage to pecans. It is a small pest which attaches itself to small limbs and sucks juice from the tree.

**Phylloxera.** Phylloxera are small, aphid-like pests that cause galls to develop on leaves and petioles early in the growing season. They are a common problem on pecan trees.

**Pecan Nut Casebearers.** The pecan nut casebearer is the larva of a small moth. These larvae bore into small nutlets and destroy them. They are capable of destroying the entire nut crop if not controlled. To control this pest, look for the eggs on the tip of young nutlets, about the time of pollination. Time insecticide applications to egg hatch for best control. A second generation of pecan nut casebearer occurs about 6 weeks after the first, but this generation usually does not need to be controlled.

**Hickory Shuckworms.** The hickory shuckworm is the larva of a small moth. It feeds on the shuck surrounding the developing pecan. This prevents the pecan from developing fully and often stops development completely. This pest occurs in mid- to late August. It takes two insecticide applications at 2-week intervals to give good control.

**Aphids.** Aphids may occur from late spring until late fall. It is best to leave aphids alone or use only soapy water to wash them off the tree.

**Pecan Weevils.** The pecan weevil occurs only in the northern half of the state. It becomes a pest in mid- to late August. The larvae of the weevil (often called “redheads”) eat the nutmeat and bore a round exit hole in the pecan shell.

**Foliage Pests.** A number of foliage-feeding larvae can damage pecans. Some of the most important are the fall webworm and the walnut caterpillar. Watch for infestations of these pests. When extensive foliage feeding is observed, control the pests with applications of the same insecticides used on the pecan nut casebearer.
Diseases

Homeowners involved with growing fruit and nuts often experience reduced fruit quality or quantity due to plant diseases. Fruit and nut crops are susceptible to one or more disease problems throughout their lives. Effective disease control involves using both cultural and chemical practices. Most diseases that infect fruit and nuts are caused by bacteria, fungi, viruses or nematodes.

Bacteria. Several bacteria cause serious problems on fruit plants. Fire blight of pear and apple, bacterial leaf spot and bacterial canker of peach and plum are three of the more frequently observed diseases in the home garden. Bacterial diseases are found in all areas, but they are generally more severe in areas of high to moderate rainfall. Bacterial diseases are controlled by resistant varieties, fungicides and cultural practices.

Fungi. This group of organisms is the most widespread and damaging to fruit and nut crops. Fungi survive on diseased plant material or on alternate crops. Vascular wilts; root, trunk and fruit rots; and leaf spots are all symptoms of fungal infection. Disease problems are most severe during periods of high humidity or when the plant tissue is covered by a thin film of moisture. Temperatures between 70° and 85°F are favorable for most fungi.

Viruses. Viruses are submicroscopic pathogens that increase in number once they are inside the host plant. Viruses can be spread by insects, nematodes, seeds and infected propagating material and by mechanical methods. Individual virus cells can be observed only with the aid of an electron microscope. Symptoms can often be confused with those of plant mutations, nutrient deficiencies, toxicities or other pathogens. Virus diseases are controlled with the use of resistant varieties, rotations, and weed and insect controls.

Nematodes. Plants infected by nematodes develop distinct symptoms based on the type of nematode parasitizing the plant. Root knot nematode, the most common and damaging nematode pest, will cause galls or swellings on the roots, stunting and minor element deficiency. Resistant rootstocks, rotation and pre-plant nematicides are used to control nematode problems in home and fruit plantings.

Disease Spread. Many disease-causing organisms are blown by wind from diseased trees or plant parts to nearby healthy plants. Brown rot of peaches, black rot of grapes and scab of pecans are spread by spores carried by air currents. Once plants become infected, rain or irrigation water splashing on diseased parts further spreads the pathogens.

Disease-causing pathogens can also be spread mechanically during pruning, thinning, irrigating or cultivating. Equipment used to cultivate the orchard can also injure the roots and limbs of the trees. These injuries create wounds through which disease-causing pathogens can enter.

Disease Prevention

Preventing fruit and nut diseases is more effective than controlling them. Once a plant becomes infected, there is little to do other than pruning out the diseased part or removing the entire plant in the case of root rots or virus infection.

A disease prevention program should use a combination of cultural and chemical treatments. This requires some understanding of the disease-causing organisms and the chemicals to be applied.

Cultural Practices. Normal management practices can frequently help to control the spread of disease-causing organisms. These practices should be followed on all fruit and nut crops to help ensure that the fruits and nuts are free of disease.

Pruning: Remove dead and diseased limbs.
Fertilization: Maintain adequate levels of nutrients.
Irrigation: Apply water on a schedule designed to prevent plant stress.
Sanitation: Remove diseased plant material.

Chemical Controls. In most cases, chemical treatments are required to supplement cultural practices to produce high-quality, disease-free fruits and nuts. Pesticides should be used only according to the label instructions. Applications should be sufficient to maintain control but not excessive. When applying a material for disease control, make sure the foliage, fruit or nuts are well covered with a protective fungicide film. Most products used for disease control are effective for only 10 to 14 days, and for a shorter time in wet conditions. Repeated applications are needed as long as weather conditions are favorable for disease development and the plant is susceptible to the pathogen.

Weeds

Good weed control is a key to successful fruit and nut gardening. Weeds and grasses can stunt and even kill young trees and berries, and the competition for water and nutrients will seriously limit production of bearing fruit and nut trees.
Mechanical Control. Hand-hoeing is still the best answer to weed control in the home orchard. Mechanical tillage equipment is satisfactory, but till only up to 2 inches deep to avoid serious damage to shallow feeder roots.

Mulches. Mulching provides multiple benefits, including weed control, reduced water loss, and cooler soil temperatures. Thick mulches keep light away from seedlings and provide a mechanical barrier to emergence. Mulching works best against weeds that come up from seed each year (annuals).

Organic mulches gradually deteriorate, and fertilizer is used in this decomposition. If you are applying fertilizer on top of a thick organic mulch, apply extra fertilizer to compensate for this loss.

It may be aesthetically desirable to have a grass cover around fruit and nut trees that are a part of the landscape. Mature trees compete with grass much better than young trees do, so keep a weed-free circle around the tree for the first 3 to 4 years.

Herbicides. Do not use herbicides in your home orchard unless you fully understand all aspects of safe handling and application. Glyphosate (Roundup®), a systemic weed and grass herbicide, has become popular in orchards because of its ability to kill persistent perennials such as bermudagrass and Johnsongrass. But glyphosate can also kill fruit trees and berries if there is significant contact with leaves or green bark. Spray drift as well as direct spray contact is dangerous, so apply glyphosate or other contact herbicides when there is little or no wind and shield small plants.

Pre-emergent herbicides, which prevent germination of weed and grass seed, require specialized accurate spray equipment. Pump-up garden sprayers and most other types of hand-gun equipment are unsuitable. These chemicals should be used only by people who have the proper spray equipment and have a full understanding of calibration procedures.

Stay well away from fruit and nut trees and berries with selective lawn herbicides that contain 2,4-D. This hormonal-type herbicide kills broad-leaved weeds but does not injure grasses. Slight spray drift or 2,4-D residue remaining in a sprayer can seriously damage or kill trees and berries. Grapes are especially vulnerable to 2,4-D.

If you do not fully understand safety and application procedures, you should not use any herbicide. A safe rule of thumb is: “If in doubt, hoe it out.”

Pest Controls For Home Use

As a home gardener, you need to be able to recognize pest species and to be familiar with their damage. Also, you should be able to recognize beneficial insects which help control pest species. For guidance in learning to identify and control pests of fruit and nuts, refer to Texas Agricultural Extension Service publications L-1876, “The Peachtree Borer”; B-1238, “Managing Insect And Mite Pests Of Commercial Pecans In Texas”; and B-5041, “Homeowner’s Fruit and Nut Spray Schedule.” These publications are available from your county Extension office.

You should inspect your orchard frequently. If you find damage and insect pests, apply an insecticide. Repeated applications may be necessary with some pests. Check the plants 2 to 3 days after application to see if adequate control has been achieved. Apply insecticides only according to label directions.

Helpful Hints. Home fruit growers continuously battle insect pests. Certain practices help to control fruit pests and protect the quality of produce. Some helpful hints are listed below.

- Keep plants in a healthy, vigorous state. Healthy plants can withstand insect attacks much better than weak plants. Do not allow plants to suffer from lack of water or fertilizer.
- When infestations of damaging pests are found, apply a registered insecticide immediately. Do not allow pests to build up high numbers.

Pesticide Formulations. Several pesticide formulations are available for home orchard use. At certain times one formulation may be better than another. The choice of formulation depends upon your personal preference, convenience, the equipment available and, at times, the pest that must be controlled.

Dusts are ready to use in the desired concentration and require no dilution or mixing. They are easily applied and are most effective when used thoroughly but sparingly. Dusts cannot be mixed with water.

Soluble powders and wettable powders are purchased as concentrates. They are to be diluted before use by mixing with water. Do not use them as dusts as this may damage plants.

Emulsifiable concentrates are liquid formulations which are to be diluted with water to obtain the desired concentration for treating plants.

Granules are dry, granulated materials that come ready to use. Spread them on the surface or work into the top 2 to 3 inches of soil.

Baits contain a desired food of the pest in addition to a toxic substance. When the pest eats the bait, the pest ingests enough toxicant to kill it. Baits are applied to areas that pests frequent.
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