

Pecan Planting & Fertilization

Pecans (*Carya illinoensis*) will grow in almost any soil in South Carolina, except poorly drained soil, hardpan or stiff clays, or thin sands with a high water table. Pecans are recommended for home landscapes from the Coastal Plains to the Piedmont but are not recommended for the mountains because of reduced yields due to late freezes. Air drainage is not so important for pecans as for other tree fruits, but avoid setting pecan trees in areas where there is no free air movement. Good air movement hastens leaf-drying and lowers humidity, reducing the chance for diseases to occur.

Flowering & Fruiting Habit

The pecan is monoecious, that is, the male (catkin or staminate flower) and female (pistillate flower) flowers are borne separately at different locations on the same tree. The female flowers are borne in clusters near the ends of current season's shoots in the spring. The catkins are borne on the base of the shoot and along the length of the supporting 1-year-old wood.



The male catkins are born below the new season's growth on one year old wood.

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Pecans are pollinated by the wind. When the catkins mature, huge quantities of pollen are shed, which increase the chances that the windblown pollen will land on the stigmas of the female flowers. Should the catkins mature before or after the female flower is receptive, pollination does not occur. The fruits develop only after the female flowers are pollinated, and the ovules are fertilized by male cells from the pollen.

Usually, within a pecan cultivar, pollen shedding does not closely overlap the period when the stigma is receptive. This condition is called dichogamy, which tends to ensure cross-fertilization. Pecan cultivars differ in the order that the staminate and pistillate flowers mature. When pollen is shed early, before the female flowers are receptive, the cultivar is called protandrous; when the pollen is shed late, after the female flowers are receptive, the cultivar is called protogynous. Protandrous cultivars are commonly referred to as Type I and protogynous cultivars as Type II. As might be expected, the catkin growth of protandrous cultivars occurs before shoot growth; in protogynous cultivars, shoot growth precedes catkin growth. Despite dichogamy, some self-pollination can be expected. Plant pecan trees within 200 feet of one another for adequate pollination. Plant at least three varieties together for maximum pollination and production.

Varieties

Numerous pecan varieties are available, but only a few are suitable for landscape plantings. The primary reason is that many home gardeners will not be able to spray to control destructive diseases. Fortunately, there are scab-resistant varieties that produce high-quality kernels.

The varieties recommended for landscape tree plantings are listed in Table 1. To ensure good pollination, plant at least two of these varieties. Recommended pollinator varieties are listed in Table 2. This is especially important for areas with few surrounding pecan trees. In areas where pecans are common, pollination is not normally a problem.

Site

Location is important because of the ultimate size of the tree. Plant trees well away from the residence and other buildings. Perhaps the biggest obstacle to be avoided is overhead power lines.

When selecting a site in the landscape, consider the eventual spread of the tree. Space the trees at least 60 to 80 feet apart so they will not become crowded as they reach maturity. Crowding can cause misshapened trees and decreased production in shaded areas. Unlike commercial situations, trees planted in the landscape should be spaced far enough apart so they will never need to be removed.

Do not plant low-growing, shade-tolerant shrubs under the pecan trees, as these will compete for moisture and nutrients. Ideal cover under a landscape tree would be some type of lawn grass suitable for that area.

Planting Trees

The best tree size for the home gardener to transplant is a 4 to 5 feet propagated tree from the nursery. These trees will generally be bare-root if ordered directly from the nursery or may be packaged if bought from a garden center. Pecan trees should be planted as soon as they are received.

Bare-root or packaged pecan trees can be transplanted anytime during the dormant season, but late fall and early winter is the best time.

In recent years, container-grown pecan trees have become available for the home gardener. This type is superior to either bare-root or packaged. Container-grown trees can be planted anytime of the year, but early in the dormant season is best. Care must be given to provide sufficient moisture, especially when planting during the summer months.

Dig a hole at least 24 inches wide at the bottom and 2½ to 3 feet deep. Examine the roots and remove all broken or injured roots. Occasionally the taproot and/or some of the lateral roots will need to be pruned to fit the hole. Never twist lateral roots in the hole, as this could eventually cause death to that part of the root system.

Plant the tree at the same depth that it grew in the nursery. Fill the hole about one-third full of topsoil and saturate the soil with water to settle, repeating this operation until the hole is almost full. Then construct a basin around the tree 2 or 3 feet in diameter and 6 to 12 inches deep. Ideally, this constructed reservoir should hold 10 to 15 gallons of water at each watering.

Remove one-half of the top of the new tree. This is essential for encouraging vigorous growth and rapid establishment.



Plant the pecan tree at the same depth that it grew in the nursery.

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Mulch trees with a 2- to 3-inch layer of pine straw, leaves, or old sawdust. This helps conserve moisture and reduces competition from grass and weeds, but do not let the mulch touch the trunk.

Care of Young Trees

Watering: The primary aftercare chore for successfully growing pecan trees is to supply the trees' moisture needs for the first two or three years. The basic reason for this is that most young trees have lost a large percentage of their roots during

digging and transplanting. This limited root system must be supplied regularly to meet the needs of the top. Apply 10 to 15 gallons of water at regular weekly intervals, either by rainfall or irrigation. This is one chore that must not be neglected.

Fertility & pH: Do not place fertilizer in the planting hole because it may injure roots. Young pecan trees do need a ready source of nutrients to promote rapid growth. For accurate determination of fertilizer and lime needs, take a soil sample prior to planting. If no soil test was done, use a general rate of about 1 pound of 16-4-8 or 15-5-10 fertilizer distributed in a 25-square-foot area around the tree. Make this application immediately after planting and again in June or July. The following February, apply 4 pounds of 16-4-8 or 15-5-10 fertilizer for each inch of trunk diameter (measured 1 foot above soil surface). Do not place fertilizer within 12 inches of the trunk. Young trees should make from 2 to 4 feet of terminal growth each year. Where growth is less, also apply 1 pound of 34-0-0- or 2 pounds of 15.5-0-0 (calcium nitrate) fertilizer per inch of trunk diameter in June or July. As a general recommendation, apply 1 pound zinc sulfate per tree for the first three years after planting. Spread the fertilizer and zinc sulfate in a circle around the tree outside of the planting hole.

For more information on soil testing, refer to the following fact sheet: [HGIC 1652 Soil Testing](#).

Care of Bearing Trees

Fertilizing: Fertilization is one of the most important practices for bearing trees. If the trees are to produce a good crop, terminal growth should be 6 inches each year. Test the soil in the fall for lime, zinc, and fertilizer recommendations. Lime applications should be done in the late fall. In the absence of a soil test, broadcast 4 pounds of a complete fertilizer such as 16-4-8 or 15-5-10 for each inch of trunk diameter (measured 4½ feet above soil level). This fertilizer should be applied evenly beneath the canopy of the tree in mid- to late February.



Fertilizer should be applied evenly beneath the canopy of the tree in mid- to late February.

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Zinc nutrition is especially important in pecan production. Zinc deficiency is called rosette. The most common and noticeable symptoms of rosette are bronzing and mottling of leaves, early defoliation, dead twigs in tops of trees, abnormally small nuts, small yellowish, chlorotic leaves, and short, thin twigs growing on older scaffold branches with rosettes of small yellowish-green leaves at the tips.

It is not necessary to apply zinc unless a soil test deems it deficient. The zinc levels are sufficient when a soil test indicates levels are at 20 pounds per acre and insufficient when they drop below 15 pounds per acre. February, evenly apply 1 pound of zinc sulfate beneath young trees and 3 to 5 pounds under large trees each year until a soil test shows that zinc is in the correct range. Soil tests should be repeated every 2 to 3 years to insure a good pecan crop.

A soil pH of 6.0 to 6.5 assures the availability of essential nutrients. If the pH is too low or too high, uptake and use of nutrients is impaired. Apply lime as suggested in the soil test report to correct low pH.

Bearing trees should be watered on a weekly basis, especially during periods of heat and drought in August and September.

Harvesting Pecans

Prevent nut loss by harvesting early. Harvesting the nuts as soon as they mature ensures better quality. One of the quickest ways to lose nut quality is to let them lay on wet ground. Harvest early and store nuts in a clean, dry place.

Pest Control

Acceptable insect control usually cannot be achieved without spraying trees. However, refer to Table 2 for a few things that homeowners can do to manage insect problems.

Diseases can severely limit pecan production. The major disease is pecan scab. The best way to control scab is to plant scab-resistant varieties. In many cases, pecan scab cannot be controlled on susceptible cultivars without spraying fungicides. However, sanitation can almost always help reduce losses from scab and other minor diseases. Nearly all fruit and foliage diseases of pecans, including scab, overwinter on plant parts infected the year before. Rake up and dispose of leaves and shucks during the winter to reduce carry-over of scab and other diseases and help in their control. Remove limbs touching the ground to promote air movement under the tree, which helps reduce the leaf wetness necessary for disease infection.

For more information on problems with pecans, refer to the following fact sheets: [HGIC 2211, *Pecan Diseases*](#) and [HGIC 2213, *Reasons for Poor Quality Pecans*](#).

Birds & Squirrels

Squirrels are often serious pests, especially if trees are located near a wooded area. No chemicals are currently legal for poisoning squirrels or birds. However, barriers and trapping do offer some protection from squirrels.

Barriers: Individual trees can be protected from squirrels by banding the trunk with a metal shield about 24 inches wide, encircling the trunk about 6 feet above ground as squirrels are able to jump 5 ½ feet from the ground. Slots on the metal, instead of holes, will allow the metal band to slip past the fastening spikes as the tree grows. Partially withdraw the spikes each year to prevent them from becoming embedded in the trunk. Also, remove any low hanging limbs below 6 feet to prevent the squirrels from jumping onto the limbs.

Trapping: Live traps and size 1½ leg-hold traps will catch squirrels. Trapped animals can then be released in wooded areas.

Table 1. Quality of Pecan Varieties Suitable for Home Plantings.

Variety	Dichogamy*	Size	Kernel Quality	Scab Resistance	Productivity
Caddo	I	Large	Excellent	Average	Very good
Cape Fear	I	Large	Good	Resistant	Very good
Creek	I	Small	Average	Resistant	Very good
Elliott	II	Small	Good	Resistant	Very good
Gloria Grande	II	Large	Excellent	Resistant	Very good
Kanza	II	Small	Good	Resistant	Very good
Oconee	I	Large	Good	Poor resistance	Very good
Pawnee	I	Medium	Excellent	Poor resistance	Very good
Stuart	II	Large	Excellent	Resistant	Very good
Sumner	II	Large	Excellent	Resistant	Very good
*Type I = protandrous (pollen sheds before the female flowers are receptive); Type II = protogynous (pollen sheds after the female flowers are receptive). See "Flowering and Fruiting Habit" section for a more detailed explanation.					

Table 2. Pecan Varieties and Acceptable Pollinators.

Variety	Acceptable Pollinators
Cape Fear	Elliot, Stuart
Elliott	Cape Fear, Creek, Oconee, Pawnee
Gloria Grande	Cape Fear, Elliot, Stuart
Kanza	Oconee, Pawnee
Stuart	Caddo, Cape Fear, Oconee, Pawnee
Summer	Cape Fear, Creek, Oconee, Pawnee

Table 3. Insect Pests of Pecans & Controls.

Insects	Control
Aphids and mites	Apply an insecticidal soap spray to aid in the control of aphids and spider mites.. Spray as high as possible into the tree, and repeat as needed twice per week. However, contact insecticide use may make spider mite problems worse.
Hickory shuckworms	Sanitation is very important. Clean up and destroy all old shucks and debris on a weekly basis.
Twig girdlers	Pick up and discard girdled twigs and limbs. Many girdled twigs do not fall from the tree. Remove as many of these as possible.
Fall webworms	Bt (Thuricide) as-soon as webbing is first noticed.
Pecan weevils	Pick up prematurely and infested nuts and destroy infested nuts as they fall. Nuts should be picked up at least twice per week. A band of Tanglefoot® Insect Barrier may be applied on the trunk in late July each year to prevent pecan weevil infestation.

Common Pecan Nut Problems

Probable Causes for Nuts Failing to Fill: Failure of nuts to fill is caused mainly by insect and disease damage to leaves and an inadequate number of leaves. Early defoliation caused by diseases or insects and nutrient deficiencies directly influences nut filling.

Drought also causes failure to fill, if it occurs late in the growing season. The shell is formed earlier and filling occurs later in the season.

Premature Loss of Nuts: In many years, lack of pollination causes the greatest loss of nuts. Since pecans are wind-pollinated, excessive rain during bloom prevents pollination and the unpollinated nuts fall. Weather conditions in some seasons cause the male and female flowers to mature at different periods, and pollination fails to occur. Some cultivars shed their pollen before the female flowers are receptive.

Insect damage also can cause premature loss of nuts. The nut casebearer, black aphids, pecan weevils, stink bugs and shuckworm can all cause losses. Pecan weevil feeding causes nut drop.

In addition, scab, powdery mildew, blotch, and other diseases cause nut loss. Scab is usually bad worse if rainy, humid conditions occur during the early part of the season.

Too little fertilizer and drought often cause early drop of nuts. To prevent early drop, reduce competition between weeds or grass and the trees by mowing or mulching. When trees have been neglected and planted in unsuitable soil, loss of nuts is often rather severe.

Note: Chemical control of diseases and insects on large trees is usually not feasible since adequate coverage of the foliage with a pesticide cannot be achieved.

Excerpted from the *South Carolina Master Gardener Training Manual*, EC 678.

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