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TEXAS A&M AGRILIFE EXTENSION

Texas Fruit and Nut Production

# Pears

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Pears are among the few fruits that can be grown in every region of Texas. As evidence of the longevity of some pear varieties in the state, old homesteads remain in which the house may be gone, the fireplace only a relic, but the pear trees in the yard are still alive and productive.

There are two distinct types of pears that originate from different parts of the world: European pears and Asian pears. European pears are characterized by their fragrance, melting flesh fruit, and a noticeable sugar/acid balance. Asian pears have crisp flesh, delicate floral aromas, and high sugar content with little or no acid balance in the taste.

Common varieties of true European pears, *Pyrus communis*, include 'Bartlett', 'Bosc', and 'Anjou'. Their success in Texas is limited by the bacterial disease known as fire blight in all but arid Far West Texas. Many of these varieties require more than 1,000 hours of winter chilling (below 45°F), which is more than is received in all but the Davis Mountains and the High Plains in Texas.

**Figure 1. European hybrid pears.**

Asian pears derived from distinctly different species such as *Pyrus ussuriensis* and *pyrifolia*, which are native to China, Korea, and Manchuria. Varieties include

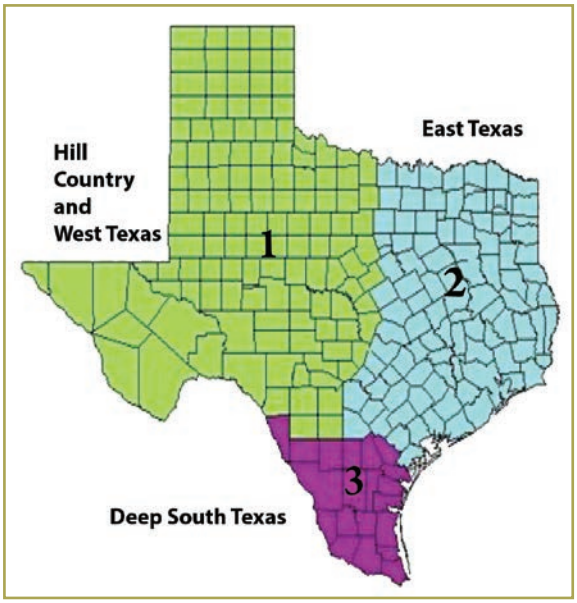


**Figure 2. Pear variety zones of Texas.**

'Shinko' and 'Chojuro'. Although Asian pears tolerate fire blight better than do European pears, in high rainfall areas or abnormally wet years it can infect many trees and cause substantial limb loss.

## Climate

Asian and European hybrid (Fig. 1) pear cultivars typically have chilling requirements of 200 to 800 hours, making at least some varieties adaptable to most areas of Texas.

Pear production in Texas is divided into three zones (Fig. 2), with extremely low chilling in Zone 3 and high fire blight pressure in Zone 2. Zone 1 affords the lowest fire blight pressure with greater chill hour accumulation.

## Soil

Although all fruit trees prefer extremely well-drained soils, pears tolerate heavy, wetter soils better than do many other fruit species. In high-pH soils, some pear rootstock varieties will exhibit substantial iron deficiency.

## Varieties

Varieties are recommended for each Texas zone to give the best combination of reliable production and disease management. However, Texas weather can change dramatically, and any variety may perform poorly in years with atypical weather and stresses.

European hybrid pears include many varieties that were bred to increase fire blight resistance. Varieties within this group, such as 'Kieffer' and 'Moonglow', range widely in their disease resistance and eating quality.

Listed below are the recommended varieties for each Texas zone.

**Zone 1: Hill Country and West Texas**

*European hybrids:* 'Ayers', 'Warren', 'LeConte', 'Magness", Maxine', 'Moonglow', Orient', and 'Kieffer'

*Asian varieties:* 'Shinseiki', 'Nijisseiki' ('20th Century'), 'Chojuro', 'Hosui', 'Shinko', and 'Shin Li'

**Zone 2: East Texas**

*European hybrids:* 'Kieffer', 'Orient", Moonglow', and 'Magness'
*Asian varieties:* 'Shinko' and 'Shin Li'

**Zone 3: Deep South Texas**

*European hybrids:* 'Baldwin', 'Hood', and 'Floridahome' (not proven, but low chilling and recommended for trial)

*Asian varieties:* 'Ya Li' and 'Tsu Li' (both require about 300 hours of chilling), have produced well in the southern Hill Country, and they appear to be adaptable much farther south

## Rootstocks

In sandy, acidic soils, *Pyrus calleryana* is the best rootstock. It has good nematode tolerance and fire blight resistance. However, it exhibits strong iron deficiency in alkaline soils.

In heavier-textured, high-pH soils, *Pyrus betulifolia* is a more adapted rootstock, but nursery stock may be more difficult to obtain.

In the Pacific Northwest, dwarfing rootstocks are commonly used in pear orchards, but these Old Home X Farmingdale crosses have performed poorly across most of Texas.

## Site preparation

Although pears bloom later than some other fruit crops, in some years, spring frost will reduce the crop. Planting on an elevated site or hillside to allow air flow will minimize losses from spring frost. In the year before planting, remove existing vegetation to reduce weed competition.

## Planting

Follow these steps to improve your chances of success:

**1. Acquire the trees.**

Pear trees are typically sold as bare-rooted, budded, or grafted trees that have been grown for 2 to 3 years in the nursery. Order plant material from a reliable nursery and choose trees that are 2 to 4 feet tall and have a trunk diameter of ½ to ¾ inch. Because pears are cross pollinated, you will need to order more than one variety with similar chilling requirements to serve as pollinators.

When the trees arrive, inspect them to make sure that they are not diseased or damaged.

Figure 3a. Third-year dormant pear tree, before pruning.

Figure 3b. The tree after pruning and after weights were added to help spread the limbs.

**2. Water the trees.**

Keep the root system moist before planting, store them in a moist, cool location, and soak the root system in water for 30 minutes immediately before planting.

**3. Plant the trees.**

Pear trees are relatively upright in growth habit and can be placed as close as 16 feet between trees. Pollinizer varieties should be planted at least 40 feet from companion varieties.

Before planting, prune back only the roots that are damaged or diseased. Dig the hole to fit the root system instead of pruning the root system to fit the hole.

Plant the tree at the same depth that it was grown in the nursery. The bark will have a distinct change of color where the "nursery line" occurs. Make sure that the graft union is above ground.

Backfill the hole with soil. There is no need to incorporate compost or organic matter unless the soil is very poorly structured or highly calcareous. Do not put fertilizer in the hole at planting.

**4. Water the trees well by hand.**

Drip irrigation can be used to supply water to trees during the growing season, but after planting, hand water newly planted trees to eliminate air pockets from the planting hole.

Figure 4. Many short lateral spurs that were encouraged by limb spreading.

**5. Prune the trunks.**

Cut back the trunk by about a third and paint the pruning wound with paint or sealant to help prevent fire blight infection.

## Pruning/training

Pears are typically trained in one of two systems:

- **Central leader system:** A single strong dominant trunk is selected, and scaffold limbs are developed every 3 to 4 feet (Figs. 3a, 3b).
- **Modified central leader system:** Three or four leaders are retained instead of only one. Scaffold limbs are developed as in the central leader system.

To increase fruit production, encourage lateral branching and the production of specialized fruiting shoots, called spurs (Fig. 4). Pears bear much of their fruit at the tip of the stem (terminal). For most fruit trees, lateral branching and spur production are encouraged by pruning. However, to reduce the risk of fire blight in pears, it is better to use weights to bend the limbs (Fig. 5).

**Figure 5. Weights on a pear tree to help spread the limbs and encourage lateral growth.**

## Cultivation

To enhance growth, control weeds and give the trees ample water and small, frequent amounts of nitrogen. To reduce the incidence of fire blight, allow the trees to grow with moderate vigor rather than trying to "push" them in the first few years of growth.

## Diseases

The most prevalent and damaging disease of pears In Texas is fire blight. Other common diseases are cotton root rot and *Fabraea* leaf spot.

**Fire blight:** The bacteria that cause fire blight can invade all parts of the pear tree, including the roots, shoots, leaves, flowers, fruits, branches, trunk, and entire trees (Fig. 6).

The symptoms include water-soaked blossoms; wilted, blackened leaves; dark, shriveled fruit; discolored bark; and dead branches. The shoot tips turn black and bend into the shape of a shepherd's crook (Fig. 7). Gummy, amber-colored ooze seeps through cracks and pores. The ooze contains millions of bacteria, which are spread by insects or rain. Left alone, the infection may kill the tree.

The main line of defense against fire blight is to choose the correct varieties for your location. However, some fire blight infection is inevitable because high rainfall, especially during bloom or in the heat of sum-

**Figure 6. A pear tree damaged by fire blight.**

**Figure 7. A shoot tip blackened by fire blight.**

mer, can increase disease pressure.

Early in the growing season, you can reduce the potential for fire blight infection by applying low rates of copper fungicides such as copper hydroxide, copper oxychloride, or copper sulfate. Do not apply copper after fruit set, because it can russet some varieties.

During the late dormant season, applying higher rates of copper for *Pseudomonas* control can also help reduce fire blight inoculum (the disease-causing bacteria) in the pear orchard.

When fire blight infection does occur, prune out diseased wood at least 8 to 12 inches below the last sign of infection. Remove infected wood and burn, bury, or haul it away from the orchard.

To prevent spreading the disease to other trees, disinfect the pruning equipment with a 10 percent bleach solution. Immediately afterward, dry and lubricate the tools to prevent severe rusting.

**Cotton root rot:** Pears are very susceptible to cotton root rot *(Phymatotricopsis omnivora),* a soil-borne pathogen that occurs in alkaline soils. This disease causes the tree to decline slowly in cool weather and suddenly wilt and die in the summer. The roots are rotted, and dead and dying leaves often remain on the tree.

To date, no effective fungicidal treatments for cotton root rot have been developed, and no rootstocks with known tolerance have been identified. Soil tests cannot predict the potential for disease incidence; however, creek bottoms and other sites where sediment is deposited are more prone to this disease than are upland locations.

***Fabraea* leaf spot:** *Fabraea* leaf spot is perhaps the most significant fungal disease of both pear foliage and fruit. In wet years, this pathogen can significantly defoliate susceptible cultivars and cause pitting in the fruit flesh.

Organic particle film barriers such as kaolinitic clays have shown promise in suppressing diseases and insects on a wide variety of fruit crops and may help manage this problem.

While sanitation or the removal of infected tissue can help, commercial fungicides may be needed in some locations, especially in wet years, to reduce severe disease symptoms. For

homeowners, the choices of fungicides may be extremely limited because the commercial products formulated for agricultural producers are extremely expensive.

Fungicide registration and availability vary from year to year. Consult your local Extension agent for current recommendations.

## Insects

In most years there are few if any major insect problems although there may be a bit of scarring from stink bugs from time to time. Typically there is no need to spray.

## Harvest

Asian pears begin bearing fruit as early as the fourth growing season, but some European hybrids may take as long as 8 to 10 years to produce their first crop. Encouraging lateral budbreak by bending scaffold limbs to a more horizontal position can aid in the formation of fruiting spurs and bring trees into production more early.

Asian pears ripen in late summer; European hybrids ripen from late summer through mid-fall.

## For more information

Fruit and Nut Resources, Aggie Horticulture®:
http://aggie-horticulture.tamu.edu/fruit-nut



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