

Pears

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Introduction

There are a number of types of pears grown around the world, all derived from various species from the genus *Pyrus*. The European pear, *Pyrus communis*, is characterized by melting flesh fruit with an aromatic quality and a noticeable sugar/acid balance. Common varie-

ties of European pears include 'Bartlett', 'Bosc' and 'Anjou', but the successful growth of these varieties is limited by the bacterial disease

known as fire blight in all but arid far-west Texas. Many of these varieties also have chilling requirements in excess of 1000 hours, more than is received in all but the Davis Mountains and the High Plains.

Asian pears are derived from distinctly different species such as *Pyrus ussuriensis* and *pyrifolia* native to China, Manchuria and Korea. Varieties such as 'Shinko' and 'Chojuro' are representative of Asian pears which have a crisp flesh with delicate floral aromas and high sugar with little or no acid balance in the taste.



Asian pears are more tolerant of fire blight than European pears, but in high rainfall areas or abnormally wet years they can sustain substantial infection and limb loss to this pathogen.

European hybrid pears constitute a wide number of varieties derived from *Pyrus communis* X *serotina* crosses which 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, but include varieties adapted to almost all parts of the state. As is evidenced by the longevity of some of these varieties, across Texas, travelers can find old homesteads where the house may be gone, the fireplace only a relic, but the pear trees in the yards are still alive and productive.

Site & Soil Requirements

Asian and European hybrid pear cultivars typically have a chilling requirement between 200-800 hours, making at least some varieties adaptable to most areas of Texas. Trees are typically sold as bare-rooted, budded or grafted trees that have been grown two to three years in the nursery. In sandy, acidic soils, *Pyrus calleryana* is the best rootstock with good nematode tolerance and fire blight resistance, but exhibits strong iron deficiency in alkaline soils. In heavier textured, high pH soils, *Pyrus betulifolia* appears to be a more adapted rootstock choice, but nursery stock

may be more difficult to obtain. Although all fruit trees prefer extremely well drained soils, pears are more tolerant of heavy, wetter soils than many other fruit species. In the Pacific Northwest, dwarfing rootstocks are commonly used in pear orchards, but these Old Home X Farmingdale crosses have not had a good track record of performance across most of Texas.

Site Preparation & Planting

Although pear trees bloom relatively late compared to many other fruit species, it is still advised to choose a planting location on an elevated site or hillside to facilitate air drainage and minimize losses due to spring frost. As with all new fruit plantings, removal of existing vegetation is suggested to reduce weed competition during successive growing seasons. Order plant material from a reliable nursery and chose trees from two to four feet in height with a trunk diameter from one half to three quarter inches.

For best results, consider these steps:

- Inspect nursery stock when it arrives to make sure the plant material is not diseased or damaged
- Be sure to keep the root system moist and it is suggested to soak the root system in water for 30 minutes prior to planting.
- Pear trees are relatively upright in growth habit and can be placed as close as 16' between trees.
- Pears are cross pollinated, so plant a pollinizer variety at least 40' from companion varieties.
- Prune back damaged or diseased roots, but otherwise dig the hole to fit the root system, not prune the root system to fit the hole
- 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 when planting.
- Plant the tree at the same depth as it was grown in the nursery. There will be a distinct change in bark color where the "nursery line" occurs.
- Do not plant the tree with the graft union below ground. Backfill the hole with soil and water the trees in well by hand.

- Drip irrigation is fine for normal watering during the season, but it is important to apply enough water to eliminate air pockets from the planting hole.
- Nursery stock usually come as un-branched whips, so prune the trunk back by approximately one third and paint the pruning would with paint or sealant.

Managing Fire Blight

The main line of defense against fire blight is choosing the correct varieties for a given loca-



Blackened shoot-tip or "crosure" from fire blight

tion. High rainfall, especially during bloom or in the heat of summer can, however provide significant disease pressure in any location and some fire blight infection is inevitable. Copper fungicides such as copper sulfate, copper oxychloride or copper hydroxide at low rates during the early part of the growing season can help reduce fire blight infection poten-



Fire blight-affected tree

tial, but after fruit set, copper can russet some varieties. Higher rates of copper applied during the late dormant season to control *Pseudomonas* can also help reduce fire blight inoculum in the pear orchard. In addition to these measures, when fire blight infection does take place, be sure to prune out diseased wood at least eight to twelve inches below the last sign of infection. Remove infected wood and burn, bury or haul away from the orchard. Be sure to disinfect pruning equipment with a 10% chlorox solution, but be aware that without immediate drying and lubrication, this disinfection can cause severe rusting of saws, loppers and hand shears.

Other Pear Diseases

Although not as severely affected as apples to Cotton Root Rot (*Phymatotricopsis omnivora*), pears are indeed very susceptible to this soil borne pathogen where soil pH is above 7.5. At this time, there are no effective fungicidal treatments and no rootstocks with known tolerance to overcome this significant pathogen. Soil tests cannot predict potential disease incidence, but creek bottoms and other alluvial soil deposition sites are more prone to this disease than upland locations.

Fabraea leaf spot is perhaps the most significant fungal disease of both pear foliage and fruit. This pathogen can cause significant defoliation of susceptible cultivars in wet years and fruit infections that result in the pitting of fruit flesh. The use of 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 be of help in managing this problem. While sanitation and the removal of infected tissue can be of assistance, 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 due to the extremely high price of commercial ag-formulated products. Fungicide registration and availability vary from year to year. Consult your local extension agent for current recommendations.

Cultivation

As with all young fruit trees, growth is enhanced by small frequent amounts of nitrogen, ample water and good weed control. In order to reduce the incidence of fire blight, we normally recommend that trees be grown with moderate vigor rather than trying to "push"



Third-leaf dormant pear trees, before and after pruning. Weights have been added to pruned tree to help spread limbs and encourage lateral growth.



Lateral spur formation is enhanced by limb spreading

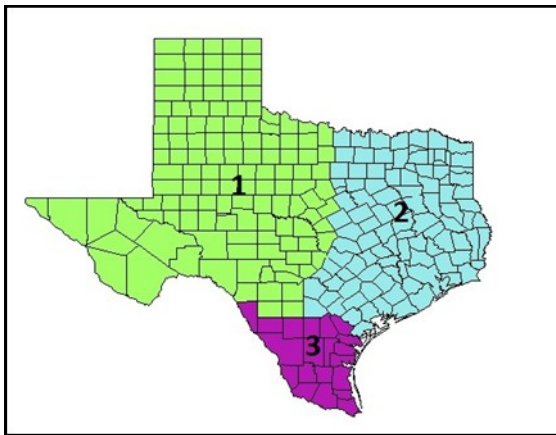
the trees in the first few years of growth. Because of their natural upright growth habit, pears are typically trained in a central leader or modified central leader training system. Select a single strong dominant trunk and develop scaffold limbs every three to four feet. In the modified central leader system, after the first set of scaffold limbs are selected, three to four leaders are retained rather than only one. Pears are strong terminal bearers and produce specialized lateral fruiting shoots called spurs. This means that encouraging lateral branching and spur production will increase overall fruit

productivity. We typically encourage lateral branching in fruit trees through pruning, but in order to reduce the risk of fire blight, bending limbs weights can also help overcome apical dominance and encourage spur production.

Asian pears generally start bearing in the fourth growing season, but many European hybrids do not come into production early and some varieties may take as long as eight to ten years to bear their first crop. Using these techniques to encourage spur production can help overcome this slowness to bear fruit.

Recommended Varieties for Various Areas of Texas

Pear production in Texas is divided into three zones, with extremely low chilling in the south zone (3) and high fire blight pressure in zone 2. Zone 1 affords the lowest fire blight pres-



sure with greater chill hour accumulation. Varieties are recommended for each zone to give the best combination of reliable production and disease management. Texas climate is very dynamic, and variety performance problems may be experienced in years with atypical weather and stresses.

1. Hill Country & Western Texas

- European Hybrids- 'Ayers', 'Warren', 'LeConte', 'Magneess', 'Maxine', 'Moonglow', 'Orient', 'Kieffer'
- Asian Varieties- 'Shinseiki', 'Nijisseiki' ('20th Century'), 'Chojuro', 'Hosui', 'Shinko', 'Shin Li'

2. East Texas

- European Hybrids- 'Kieffer', 'Orient', 'Moonglow', 'Magneess'
- Asian Varieties- 'Shinko', 'Shin Li'

3. Deep South Texas

- European Hybrids- 'Baldwin', 'Hood', 'Floridahome' (not proven, but low chilling and recommended for trial)
- Asian Varieties- 'Ya Li', 'Tsu Li' (both approximately 300 hour chilling requirement), have produce well in the southern Hill Country, but appear to be adaptable much farther south.

For More Information

<http://aggie-horticulture.tamu.edu/fruit-nut>