Texas Pecan Orchards

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Pecans have been an important food for man and wild animals in Texas for thousands of years. Prehistoric Indians depended on native pecans as food. Deer, turkey, squirrels, raccoons, crows, and many other animals feed heavily on pecans today as they have in the past. Pecan production as a commercial operation first started as simply gathering native nuts and selling them to the highest bidder. As early as 1840, native pecans were shipped to Europe for sale. Today the pecan can be managed as a native grove, a planted orchard of improved varieties, or as a landscape tree. Texas averages 60,000,000 pounds of pecans annually, equally divided between natives and improved varieties from planted orchards. This discussion is about planted orchards; natives and landscape pecans are covered in separate reports.

The key to pecan orchard profits in Texas depends on many factors. The following is an introduction to the most important. It is important to understand that all of these factors can and should work together to yield more than 1,000 pounds of high quality pecans per acre; however, any one factor can result in poor tree growth, no pecans, and death to the tree. Potential pecan growers need to study these factors in detail before planting an orchard.

Orchard Size

Orchard Size is a significant limitation. All too often, Texas pecan orchards are too large. They require $2,000 per acre to bring into production, and frequently there is not enough money to accomplish the basic management needs. Time and labor can be insufficient if the orchard is too large. Pecans require 2 inches of water per week once in production, so water volume and the cost of delivering the water need to be considered when determining the size of an orchard. One can gather volumes of information on growing pecans, but knowledge is very slow and hard to obtain. Beginning growers need to start small so they can learn as they go. Once the basics are understood, then the orchard can be expanded to the size money, time, labor, and water will allow.

Teamwork including husband, wife, children, relatives, other growers, county Extension agents, pecan specialists, labor, equipment and chemical dealers, bankers, pecan buyers,

and others is very important. Pecan families need to write a production plan each year before growth begins so everyone understands what needs to be accomplished including when, how, and by whom.

Climate is extremely important and there is no location better suited for pecans than Texas. Pecans require 285 growing days with warm nights. Rainfall, though essential for good growth, also affects Pecan Scab, entry into the orchard, and harvest. Freezes can kill trees less than 10 years of age which are growing fast or old trees which are stressed from either crop load, drought, or a combination of factors.

Soil for pecan orchards should be deep and well drained to hold water, air, and nutrients. Poor soil drainage is one of the most serious limiting factors in pecan orchards. More orchards fail in Texas because of undesirable soil than from any other factor, and unfortunately, management cannot correct or substitute for soil limitation. Pecan trees can grow on very shallow soil, but for commercial production of more than 1,000 pounds per acre, the soil should be 32 inches deep.

Irrigation is essential in all areas of Texas. Mature bearing trees require 2 inches per week. In addition, pecan orchards should ideally be irrigated every week or at least never be allowed to go longer than 21 days without water. The entire orchard floor needs to be covered. Salts in the soil and/or water can significantly reduce growth or kill the trees in extreme cases. Potential pecan orchard sites or problem orchards need to have their irrigation wells tested for water volume, quality, and the cost of electricity for pumping the water. A good rule of thumb is to have a well capacity of 10 gallons of water per minute for each acre of trees.

Varieties need to be productive, strong trees, with high quality kernels and resistance to Pecan Scab disease. There are three variety groups: eastern scab-resistant varieties, western varieties which grow well under desert conditions where Pecan Scab does not exist, and early-ripening northern varieties. Recommended varieties for the east are Desirable, Cheyenne, Cape Fear, Pawnee, Forkert, Caddo, and Oconee. For the west, Western, Wichita and Cheyenne are recommended. Northern variety recommendations are Caddo, Pawnee and Osage. Remember, all varieties are different and managers need to learn how to grow a specific variety. Such is the case between the easy-to- manage Western and very difficult-to-manage Wichita. This is another reason to start small.

Spacing pecan trees far apart is essential. Once crowding occurs, trees will have to be removed. Shade, trapped humidity, root crowding, water limitations, and nutrient availability require bearing trees to be spaced no closer than 35 feet in the east and 30 feet in the west. Wider spacings are recommended for growers who will not be able to thin as trees crowd. Square, rectangle, and diagonal orchard designs need to be studied so that when trees are removed due to crowding in 12 to 15 years, the desired varieties remain at

the permanent spacing. The design should also allow for at least 20% of the varieties to be of a different pollination type after thinning occurs. Where soils are similar and a large volume of water is available, bearing trees can be moved with large tree transplanting equipment. Orchard expansion has not been successful without this soil and water requirement. If growers are unable to cut trees down or expand the orchard by moving crowded trees, the trees should not be planted closer than 50 feet.

Weeds must be controlled in young and mature pecan orchards to prevent the loss of water and nutrients. Post emergent herbicides are the most practical and economical method of weed control; however, knowledge and experience are needed to use herbicides properly. Herbicides must be used effectively and properly to kill the weeds, to reduce chemical costs, and to protect the applicator and the environment. Discing, low mowing, cattle, and sheep are used because of their ease; however, they are less than optimum and can result in long term problems.

Nitrogen is essential for good pecan growth. The first application should be at bud break in April with additional applications in May and June. When extremely heavy crops are set, as in 1993 and 1995, nitrogen could also be applied in July and August. As a rule, 10 pounds of actual nitrogen are needed for 100 pounds of pecans set per acre in June. The number of nitrogen applications should be consistent with crop size. Young trees should receive very small but frequent applications of nitrogen in response to growth. When fast growth occurs, add additional applications until early June. Potassium fertilizer may be needed once every five years on deep sandy soil if leaf levels fall below 1% potassium content. Phosphorous fertilizer is not needed in Texas.

Foliar Zinc Sprays are essential for pecan growth in Texas. Soil or irrigation applications of zinc are not effective. Zinc is needed for IAA hormone synthesis, so applications should be early and frequent to obtain optimum shoot growth and leaf expansion. Two products, granular zinc sulfate or liquid zinc nitrate, are used with equal success. Liquid nitrogen can be added to either zinc type to improve uptake into the foliage. Very fast growing young non-bearing trees need zinc sprays at least every 14 days from bud break in April to early June. Mature bearing pecan trees respond best to 5 applications of zinc. The first 3 applications should be made one week apart beginning at bud break. A 4th application should then be made 2 weeks later followed by a 5th application 3 weeks later. Zinc sulfate will kill most other plants if the spray contacts their foliage; consequently, zinc nitrate is not recommended for urban or yard use.

Diseases are serious in Texas, especially Pecan Scab disease. In east, south and central Texas effective pecan-labeled fungicide sprays must be applied during periods of rainfall to prevent Pecan Scab. In this area varieties need to be resistant to Pecan Scab. In addition, Stem-end Blight, Shuck Dieback, Powdery Mildew, Downy Spot, Fungal Leaf Scorch, and other diseases can be damaging.

Insects are a problem in Texas. The Pecan Nut Casebearer, Pecan Weevil, Yellow Aphid, Black Aphid, Stink Bug, Hickory Shuckworm, and others need to be monitored closely to determine if insecticide sprays are needed for economic control.

Harvesting pecans in Texas is a very difficult and demanding task. Pecans should be harvested, cleaned, dried, sacked, and sold before December 7 each year to maintain kernel quality and obtain a good price. This short seven week harvest season may have at least 14 days of delay because of rain. Some years rain and cold occur, making harvest difficult even for the strongest. Theft from man and animals, especially crows, can significantly reduce the pounds of pecans harvested, even when every effort is made to prevent it. Much of the Texas crop is harvested by machines such as trunk shakers, sweepers, and a number of other different types of harvesters. Some pecans are harvested by hand for cash sale to Accumulators.

Processing pecans immediately after harvest is needed to obtain a good early season price and to prevent kernel darkening, embryo rot, vivipary, mycotoxins such as aflatoxin, and other problems related to moist pecans. Shucks not removed in the orchard by nature or the harvesting equipment are removed with dehulling equipment. In south Texas, where harvest is begun before the shucks are fully open to prevent vivipary, the shucks must be ground off in water with special equipment. Once deshucked, poorly filled pecans are vacuum separated with a pop remover. The good pecans are dried from 15% moisture to only 4% as soon as possible using forced air. This can be in special drying boxes, false bottom peanut trailers, open-weave sacks, or on concrete floors. Drying time is greatly reduced by moving as much dry air over the pecans as possible.

Marketing pecans can be a frustrating task for all parties involved. The price is controlled by supply and demand. Few growers grade their pecans. The USDA and the National Pecan Shellers have grading standards, but they are not easy to use. Growers who use the Texas Pecan Show Grading System of percent kernel, size, and color can negotiate for a fair price. The pecan is an alternate bearer, producing a very large crop one year and few pecans the next. In the "off" years, the price is high, and the price is low in the heavy "on" years. There are approximately 25 major pecan buyers with shelling plants. Pecans in large volume can be sold directly to these shellers or they can be sold to local accumulators. Less than 10% of the national crop is sold retail or direct to the consumer as in-shell pecans, though this is what many small pecan growers do. Some growers have their pecans custom shelled and retail direct to the consumer at the orchard or via mail order. Limited numbers of growers use value-added processing such as candies, roasted pecans, or cakes for direct-to-the-consumer retail sales.

Costs and Returns for pecans in Texas vary greatly. Of the 67,500 acres of planted orchards, many seldom realize a profit because one or several of the above factors are not in order. Approximately $2,000 are required to bring one acre of pecans into production,

not including the cost of the land, irrigation well, or deer-proof fencing. Once bearing, $600 per acre are required for operating costs; therefore, production needs to exceed 600 pounds per acre if a profit is expected. Since 1986, there are very limited IRS tax advantages for pecans and profits need to be determined on a true cash basis.

Information on pecan production can be obtained from the "Texas Pecan Handbook" which is available at Extension Horticulture, TAMU, College Station, TX 77843-2134 for $15 made payable to Pecan Handbook. Also from Extension Horticulture is a video on "Planting and Establishing Pecan Orchards" for $10 payable to Pecan Video. County Extension agents in Texas assist growers with information on planning, planting, and managing pecan orchards, and their phone is listed under county offices. The Texas Pecan Orchard Management Shortcourse is taught annually the last week of January at Texas A&M University. For registration, phone 409-845-8904. The Texas Pecan Growers Association has an annual meeting and publishes "Pecan South" monthly. Send $15 to purchase a one year subscription to TPGA, Drawer CC, College Station, TX 77840.

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