Knapp Pecan Orchard

A Horticulture Review

By

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Overview: **McEachern 2006**

Few crops are better adapted to Texas than the pecan. The rivers and major creeks with deep well drained alluvial soil has been the home of native groves for thousands of years. When settlers began to develop Texas, they realized the potential for pecans and began to plant orchards with native seed. Following WWII planted orchards of improved pecans began. In the mid 1950's through the 80's numerous pecan orchards were planted throughout Texas with new improved varieties, mainly of USDA Indian varieties.

The Knapp orchard was planted over a period of years beginning in 1983 by moving native trees sawed off at the ground to their site in rows in the orchard. The system produced 100% survival success with shoots growing up from the stumps. The two best shoots were grafted 3 to 4 feet above the ground and the others pruned out. The graft which grew best was selected and the stumps simply rotted away. The new improved variety was supported by a massive root system. Thus was the beginning of the Knapp orcahard.

To my knowledge, this is the only orchard established in this manner, making the Knapp orchard a one of a kind in the pecan industry. Three additional features make this orchard unique; it was planted as a triangle design, it is primarily of the Sioux variety, and soil water is via rainfall and a subsurface water table.

Location:

This review in for a 60 acre block of pecans established by and belonging to Jerry and Jeanne Knapp of Purdon, Texas. The property also contains 30 acres of undeveloped land with access via an all weather dirt road fromTX 31 west of Corsicana 14 miles and 50 miles south of Dallas via I-45.

Varieties:

Sioux 85%
Cape Fear.....5%
Choctaw 1%
Natives.....4%

Sioux is an excellent fit for mature trees at this site, soil, water, and climate. Being a high a percentage of Sioux is an advantage for an orchard of this age. Sioux has outstanding kernel quality, it is a strong tree, and it bears moderate crops on a regular basis when managed to its full potential. Sioux does not alternate bear as does the high yielding - high maintenance varieties, such as Wichita, Kiowa, or Cheyenne. Sioux does not demand maximum management, though it responds to essential management; such as foliar zinc sprays early in the season, nitrogen fertilization in April, May, and June, weed control and good IPM to control pecan nut casebearer, pecan weevil, pecan scab, and more.

Sioux seldom produces low quality nuts, and is the only small pecan which can be retailed as an inshell pecan. This high quality kernel is due to good gentics and a strong tree. Sioux as a mature tree with good management can produce high nut quality year after year. Small nut size yields less pounds per acre when compared to yields of larger nuts; but this is a plus for mature trees because they do not experience high yield / low nut quality stress as other do. Quality and reliability make up for moderate yields.

Sioux is good as a mature tree. With good management if can produce crops for many years as long as tree crowding does not occur. Tree crowding is corrected by tree removal, leaving more space for roots and sunlight of the remaining trees.

The Knapp orchard will need to the thinned within 4 years if rainfall and good management is applied with the trees continuing to grow well.

Sioux is not a pecan scab resistant variety and will require at least three fungicide sprays early each season to prevent scab. During heavy rain seasons, more sprays will be needed. A low mowed sod surface 10 feet wide will be needed down the row middles so that a tractor and 500 gallon speed sprayer can enter the orchard without making tire ruts or getting stuck during heavy rain periods. Fungicide sprays for scab prevention are needed only during periods of rainfall.

Pecan require cross pollination via wind in late April or May to set a crop. There will be no pollination problems at the Knapp orchard because Choctaw and native trees will more than adequately supply needed pollen. However, continuous rainfall during female flower stigma receptivity could reduce crop size because of poor pollen movement.

Tree Spacing:

The Knapp orchard is planted 40 x 40 feet on a triangle, which optimizes space with maximum trees per acre and delayed crowding. This spacing gives 31 trees per acre which is 15% more trees than those planted on a square design.

The trees are nearing the crowding point and will need 50% of the trees removed as the limbs begin to touch in the row middles. There should be four more years before tree thinning will be needed. Fortunately, the Sioux is one of the few varieties which responds very well to tree thinning. Sioux does not respond to mechanical tree hedging for the trees will make vegetative growth with limited yield. With tree thinning, this orchard should have a very long and productive life of more than 30 years.

Soil:

The soil is deep well drained with an available water table fed from Post Oak Creek. The growth and health of the trees in 23 years is testimony to the suitability of the soil and water. There will be drought years when nut size will be smaller, but there should be sufficient water to properly mature the crop. Weed and grass management will be essential in helping to maximize water use by the trees.

The 1974 USDA Soil Survey of Navarro County, Texas classifies the soil as the Gowen Series. It is deep, well-ddrained and nearly level flood plain soil of small streams.

The US CORPS of Engineers has straightened Post Oak Creek and flooding has not occurred. The good soil depth, texture, and structure can be appreciated by observing the soil profile presented on the creek banks.

The soil survey lists this soil as over 48 inches of top soil with 0.19 inches of available water capacity. With 27,000 gallons of water per acre inch, the soil can hold 246,240 gallons of water per acre or 8,000 gallon per tree. The trees need 100 gallons of water in spring and early summer and 200 gallons of water per day in August, September, and October to properly fill the kernels. Therefore, the soil could deliver 80 days of needed water in the spring without a rain; and 40 days in the late summer and early fall. During periods of drought, water will need to move upward from the subsurface water table.

The soil is classified as a clay loam which has outstanding water and nutrient holding capacity. It is difficult to start young trees in a clay loam, but mature trees fair better than on a sandy soil with less water holding capacity.

Weed Control:

The Knapp orchard will require consistent and good weed management. Water and nutrient loss to weeds, if not controlled, could reduce foliage growth and reduce tree health in the late fall. Flower and fruit set in the spring depends entirely on strong healthy foliage in the fall. The trees need to remain in full foliage until the first frost in November or December. If weeds are not controlled, they will consume water and nitrogen needed by the pecan. Cultivation, cattle or livestock grazing, or mowing are not satisfactory; chemical weed control under the trees with a low mowed sod middle is needed.

Nutrition:

Pecan production involves the manufacturing of sugars in the leaves which are converted to complex oils in the kernel. This is one of the most energy demanding crops grown. The tree and foliage are very efficient when compared to other crops, but sufficient nitrogen and zinc are needed to keep the foliage and tree healthy.

Nitrogen needs to be applied to the weed free area under the trees in April, May, and June each year. Since much of the nitrogen can be lost to runoff, leaching, and volatilization these frequent applications are essential for growth. As a general rule, 50 pounds of actual nitrogen needs to be applied per acre in each of these months.

Zinc is essential for good leaf and shoot growth but unfortunately pecan roots cannot absorb it from the soil. Therefore, five foliar zinc sprays of zinc nitrate + urea need to be sprayed each spring. Begin with bud break and spray every seven days for 21 days, then 14 days, then 21 days. The foliage needs to be sprayed only until wet; runoff is not needed.

All other essential fertilizer elements are readily available from the deep well drained clay loam soil. Phosphorous must never be applied for it ties up Zinc in the soil and foliage.

Tissue analysis of the foliage can be obtain from 100 washed and dried leaves in mid July. In addition, shoot growth and leaf expansion are a good indexs as to the health of the tree. Trees which have good foliage in the top of the tree are in good health.

Equipment:

Pecans require a significant capitol investment in equipment. The following are considered a minimum:

Tractor 80 to 100 hp
PTO 500 gallon Speed Sprayer
Pump for filling
Shredder
Herbicide Rig
Pickup Truck
Flat Bed Trailer
Barn
Chemical Storage Shed
Limb Rake
PTO Trunk Shaker

Harvester
Cleaner
Dryer
Pecan Storage
May need:
ATV
Road
Bridges
Electricity
Cell Phone
Housing, etc.

Harvesting:

Pecans begin to ripen with shuck opening in late October, November, and December. As soon as the shucks open the pecans need to be shaken from the trees and harvested. One cannot harvest ahead to time as varmints and humans will steal the nuts. To obtain optimum prices for the pecans, harvest should be completed by December 7 for holiday sales. Rainfall will delay harvesting for the mechanical harvester cannot operate in soft soil or mud. The nuts are harvested with a 10 to 20 percent moisture and need to be dried under fans is burlap or onion sacks until the moisture is reduced to only 5% so that the kernel will snap when bent.

Marketing:

Pecan marketing is through some 30 buyers called "accumulators" who sell to 20 small or 5 large shelling plants. This is a very competitive business and all accumulators attempt to pay as little as possible to prevent paying too much and loosing money when reselling to the large wholesale shellers. Fortunately, Sioux has a high market demand as both retail or wholesale. There is a new trend for small growers to have their nuts custom cracked and shelled so they can sell their nuts as 98% kernels, thus taking the middle man out of the sales. Many growers over time develop a history of good pecans with a specific accumulator and they remain loyal to each other.

Education and Information:

Pecan growers are a very friendly group and freely share information on how they manage their trees. The Texas Cooperative Extension Service and County Extension Agent can provide help. The Texas Pecan Growers Association publishes a monthly magazine on pecans, "Pecan South". The TPGA also conducts a Conference and Equipment Show annually in the state. Texas A&M University conducts a week long "Texas Pecan Shortcourse" at College Station, TX the last full week of January annually which covers all the aspects of pecan orchard management.

Loss of Management:

Sould the orchard need to go without management for a period, the soil with subsurface water should keep the trees relatively healthy and ready to respond to management when it is applied.