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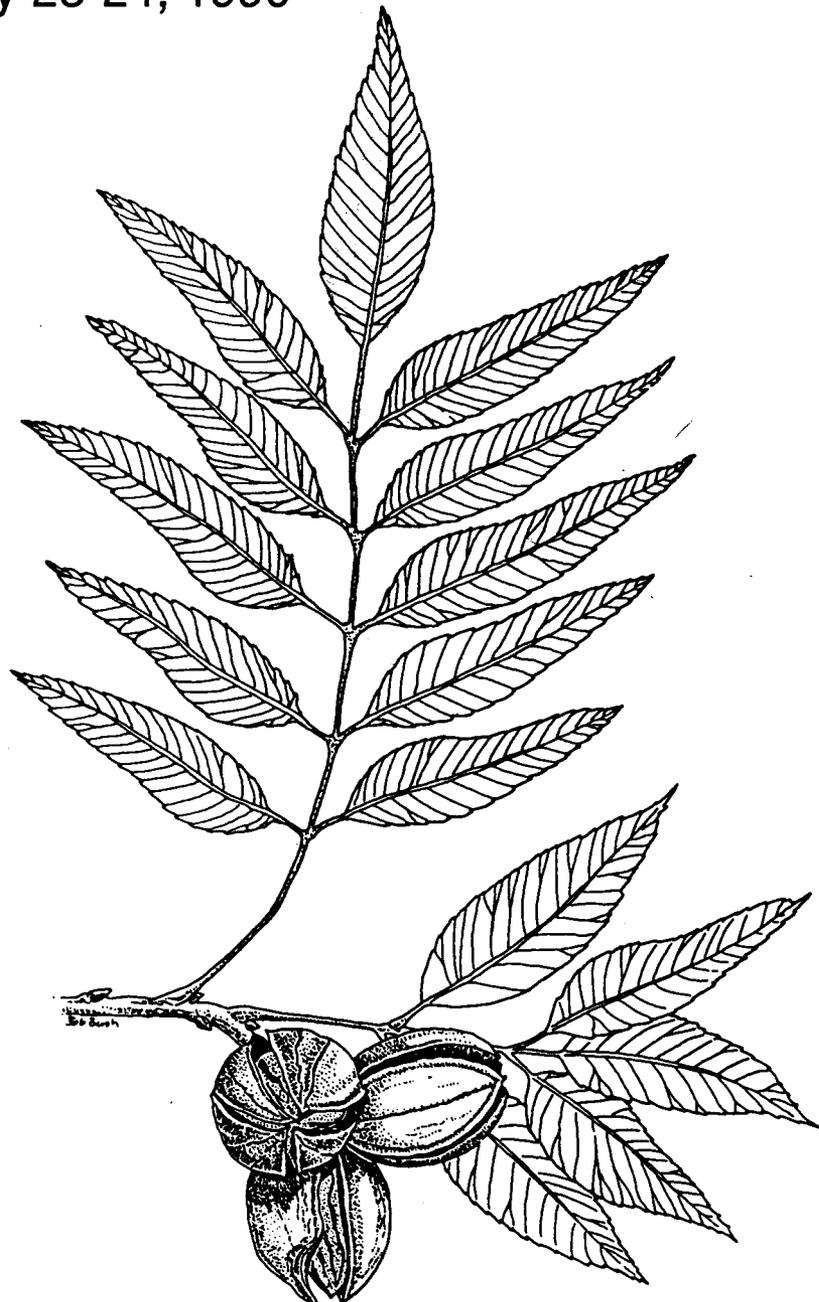
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Pecan Husbandry: Challenges and Opportunities

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KEYS TO PROFITABILITY FOR COMMERCIAL PECANS

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ABSTRACT

Low alternate yields of poor grade pecans and numerous management inadequacies resulted in general decline in profitability of pecans during the 1980's. The key to the future profits depends on increased yields and quality by obtaining optimum root absorption, light utilization and nut grading prior to first sale.

INTRODUCTION

Commercial pecan producers have had difficulty in obtaining profits in the 1980's because of alternate bearing, failure to grade nuts prior to sale, the industries inability to estimate the crop size prior to harvest, high interest rates on money used to purchase the crop, loss in medium sized shelling companies, a wide range in the types of pecans produced, a high volume of low grade pecans during high yield seasons, low wholesale prices for peanuts, almonds and walnuts, competition of high quality pecans from Mexico, low advertising strength, a large number of oversized poorly financed orchards, insufficient irrigation, inappropriate orchard soil, failure to destroy non-productive orchards, and limited knowledge of pecan culture.

Despite these limitations or challenges, the future for pecan profitability is greater today than ever before. Regular production of over 1,200 pounds per acre of top quality pecans for over 10 years in numerous orchards illustrates the potential exists. Some orchards have averaged up to 2,000 pounds and a rare few have produced even more per acre for a continuous period of time.

To obtain profitable production levels, producers are going to have to produce both high yields and high quality fruit for a number of consecutive years. The question is, how can this be accomplished? Major changes have occurred from 1970 to 1990 in the pecan industry. Fungicides, insecticides, drip irrigation, small tree trunk shakers, pull type PTO harvesters, small portable cleaners, and other industry changes have been introduced and widely accepted throughout the industry. Cultural practices such as fertilization, weed control, integrated pest management, varieties, central leader tree training, intensive orchard establishment and other cultural practices have been developed and become positive practices throughout much of the industry. Unfortunately, some negative practices which were never proven to be profitable were introduced and adopted by many growers. These include ultra high density spacing, mechanical pruning, precious varieties and scab susceptible varieties. In addition, harvesting, handling, shelling, marketing and advertising can be improved to assist pecan growers in obtaining profits.

The three major practices or concepts discussed here need to be researched and developed into functional cultural practices to assist growers of the future realize sufficient profits and continuous production. Functional solutions are available for most of the other management challenges facing the industry.

WATER ABSORPTION

Pecans require a great volume of water daily. All of the mineral elements essential for leaf growth and fruit development are dissolved in the soil water and depend on absorption. The fact that the soil contains water and minerals does not mean the roots will absorb them, in many cases it is fair to assume they will not be absorbed.

Soil water management for maximum absorption will be the key in the future of pecans. Absorption is far more complex than most scientists realize and the management practices needed will be both technical and intensive. Mathematical models are currently available for determining the volume of water required by various size trees at any climactic site in the industry. A second factor is how much water will the soil hold. This depends on soil depth, texture, structure, and other factors. It will be important to determine the speed and deep the water enters the soil. There is also the question of what percent of the water holding capacity is optimum. The total orchard floor needs to be irrigated.

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The soil air, oxygen or aeration level is a major factor in the soil water absorption process. As a grower attempts to determine how to irrigate, it will be important to know how deep soil oxygen is present in the soil. No oxygen is equal to no absorption. Essentially all water and minerals are absorbed from the top 30 inches of soil because this is where the soil oxygen is present. The soil oxygen level is determined by soil depth, texture, structure, water holding capacity, and most importantly, surface and internal water drainage.

Low water absorption can be the direct result of shallow soil, poor structured clay soil, no irrigation, tree crowding, old tree age, poor drainage and other factors.

The key to regular pecan production and quality in the future is knowing the water absorption potential of the orchard soil and the development of a water management system which optimizes water absorption on a daily basis.

LIGHT UTILIZATION

As roots absorb water, the pecan leaves must absorb light to convert carbon dioxide and water into sugar and subsequently all the food the pecan tree uses to grow and bear regular crops of quality pecans. Without photosynthesis, the tree will not produce effectively.

Shade is the major limitation to photosynthesis. Tree crowding cannot be tolerated because it shades the lower canopy. Sunlight should contact the lowest limbs as well as it does the very top. To prevent shading, trees need to be thinned out as the lower limbs touch. There has not been a successful tree pruning system, mechanical or hand, for use on commercial pecans. Tree removal is the only functional system of maintaining a pecan orchard at its full production potential. Trees should be spaced as close as possible at planting to increase early tree production; however, as soon as lower limbs touch shading of the lower canopy will occur and trees will need to be removed. This can occur as early as the ninth year on ideal sites where intensive management has been given.

The consequences of shading and crowding is recognized first as poorly filled nuts, followed by total failure to bear. It is not fair to assume economical yields can occur in crowded orchards because it will not. By thinning trees,

yields are reduced the first two years after thinning, but more importantly, yields will continue. This has been proven time and again over the last 20 years in both small and large orchards.

No management practice can compensate for shade from crowding. Stated in its simplest form, when shading occurs, no photosynthesis occurs and growth stops.

Prior to planting a pecan orchard, growers should devote a great deal of effort to planning the spacing and the sequential tree removal as crowding occurs.

Thinning is the single most difficult cultural practice a grower must accomplish however, it must be done.

GRADING PECANS PRIOR TO SALE

It has been said that pecan marketing is the last legal totally free enterprise in the United States. Unfortunately, it is a true statement. Growers do not have or do they create any economic leverage prior to making a sale. The system is simple, here are my pecans, pay me what you can.

As growers market their pecans they should have and use a system to grade their pecans to determine their value. There is a very wide range in kernel quality within the pecan industry. As a general rule, young orchards on good sites which are well managed tend to produce higher quality pecans, while there are numerous old orchards on poor sites which are not well managed which produce poor quality pecans.

There is not a universally accepted method of measuring and expressing the kernel or market quality of inshell pecans as they leave the orchard for sale. Consequently, the grower typically waits until the buyer or sheller determines a value for the pecans. This system of value determination allows the buyer a degree of economic protection from non-edible pecans, rapid price changes and other factors which commonly alter the price or value of pecans.

To determine the value of pecans, it is essential that a grower and buyer know the percent edible kernel of the pecans to be sold. Buyers and shellers cannot afford to pay for damaged or flawed pecans.

The percent edible kernel could be determined by removing all of the non-edible kernels. Before measuring percent edible kernel, all flaws such as cracked shell, adhering shuck, stink bug, embryo rot, weevil, fuzz, mold, wafer, and others need to be removed from the sample to obtain a true percent edible kernel.

Kernel color is very important in determining the value of a sample. The lighter the kernel color, the higher the value of the sample, when all other factors are equal. The colors could be designated as cream, golden, light brown, brown and black. cream and golden could be classified as fancy, light brown as choice, brown as standard and black as damaged.

Nut size can also influence sample value. The larger the size, the higher the value of the sample when the edible kernel and color are the same.

A new system, if it is to be developed, needs to be simple, easy to understand and within the capability of most growers.