

Texas Agricultural Extension Service

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PLANTING AND ESTABLISHING PECAN TREES

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New pecan production concepts such as high density, trickle irrigation, chemical weed control and precocious productive varieties have had significant impact on pecan culture in recent years. Yields as high as 1,000 pounds per acre from 7-year-old orchards have excited pecan growers throughout the industry. Heavy production at this early age requires careful planting, good soil, clean water, high light intensity, proper varieties and adequate spacing, plus an intensive orchard establishment program. Trees must make maximum growth to reach this performance level.

Good management even before the trees are planted is extremely important. The following practices are essential:

- Site preparation
- Planting technique
- Weed control
- Nitrogen fertilization
- Irrigation
- Zinc sprays
- Central leader training

Site Preparation

Pecans require deep, well-drained soil that is weed free. Set up rows with the desired spacing and cultivate three times during the winter immediately before planting. Cultivate the entire field or only down the row. It is also good to deep chisel down the row several times to break up any existing plow pans or clay layers.

In areas where bermudagrass, johnsongrass or nutgrass is well established, apply the post-emergent herbicide Roundup® in September before cultivating in October through January. This is especially true down the tree row.

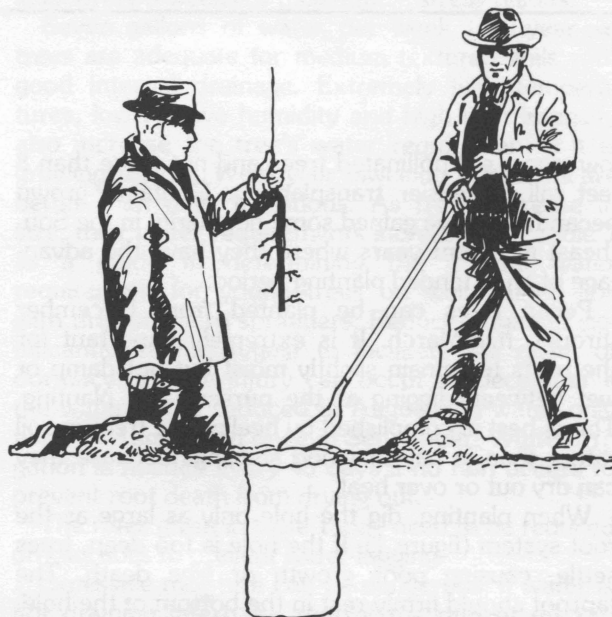
In West Texas where flood or furrow irrigation is used, level the orchard floor for proper water flow down the row. New laser leveling equipment has improved the ability to obtain optimum orchard floor leveling.

Install irrigation equipment after the rows have been cultivated and before planting. Hundreds of orchards have had tree growth and survival problems because water arrived too late.

In areas of high rainfall raise the row bed approximately 1 foot to allow maximum surface runoff. These orchards should also have sod middles to allow tractor traffic during rainy periods.

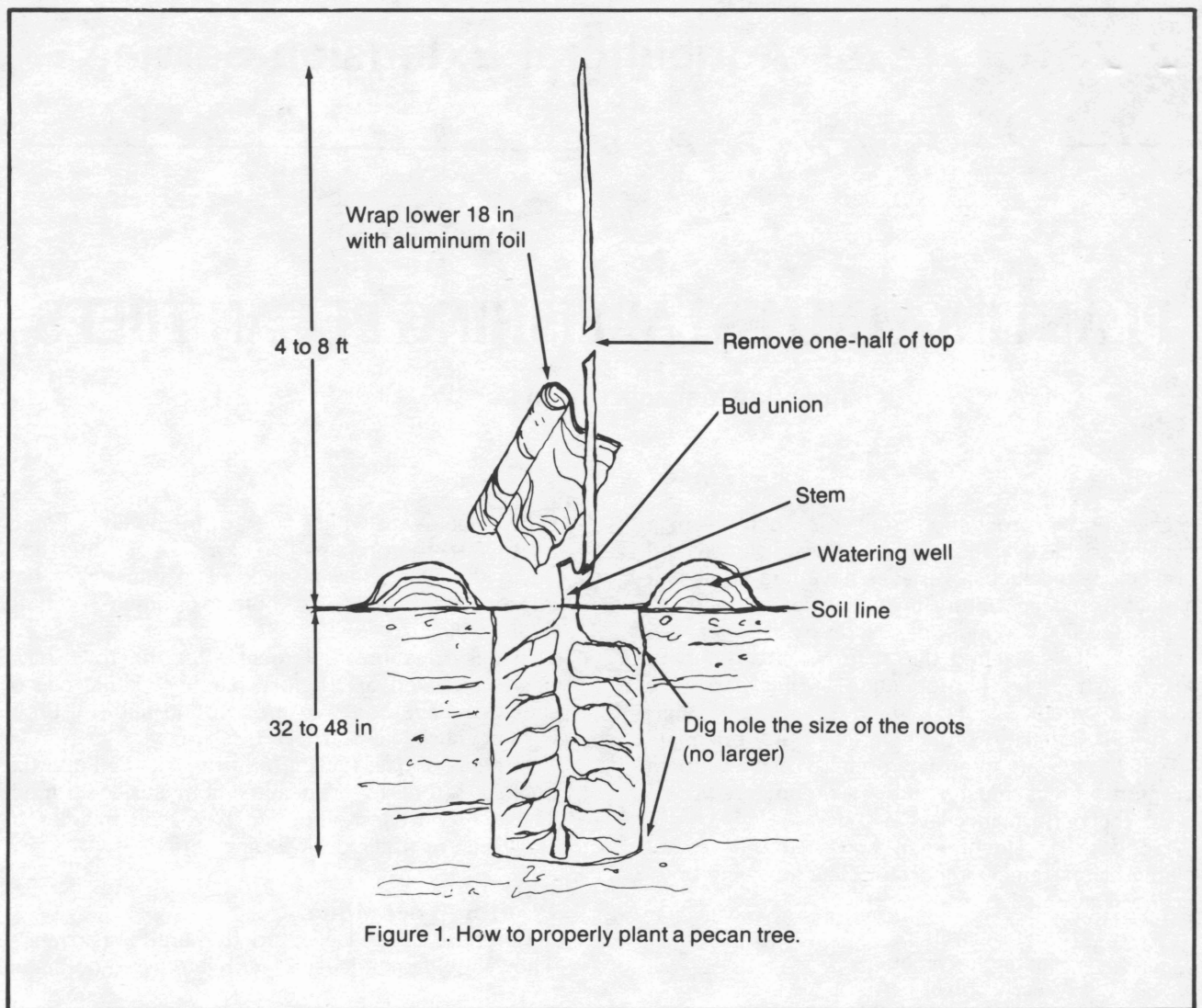
Planting Technique

Purchase pecan trees 6 to 18 months in advance. They should be at least 4 feet tall to avoid obtaining



Drawing depicts Oscar Gray, Sr. and George Koch, Sr. planting the Winter Garden Intensive Pecan Establishment Demonstration at Hondo, Texas in 1973.

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low vigor, self-pollinated trees and not more than 8 feet tall for easier transplanting. Container-grown pecan trees have gained some popularity in the Southeast in recent years where they have the advantage of an extended planting period.

Pecan trees can be planted from December through mid-March. It is extremely important for the roots to remain slightly moist but not damp or wet between digging at the nursery and planting. This is best accomplished by heeling the trees in soil rather than in hay or wood shavings because they can dry out or over heat.

When planting, dig the hole only as large as the root system (figure 1). If the hole is too deep, trees settle, causing poor growth or tree death. The taproot should firmly rest in the bottom of the hole. If the hole is not as deep as the length of the taproot, cut the taproot off so that it is supported on the bottom of the hole.

Pack the soil around the roots as tightly as possible. Packing the soil in 2- or 3-inch layers is better than watering the trees in.

Use adjacent soil for filling the hole. Do not use light soil, sand or potting soil to fill the hole. If using light fill soil on poorly drained clay soil, the planting hole remains water-logged during rainy periods frequently resulting in tree death.

Plant the tree at the same depth it grew in the nursery row. This is insured by setting the taproot in the bottom of the hole. The soil line can be determined by the colors — the bark is grey and the root is dark brown.

Cut one-half of the tree off at planting.

Wrap the lower 18 inches of the trunk with aluminum foil to prevent shoot growth, sun scald and rabbit damage. On large plantings, white latex paint and water can be used. A 1:3 ratio of paint to water is adequate.

Table 1. General water rate guide for pecans on well-drained soil in Texas.

Tree years	Volume per Week					
	April	May	June	July	August	September
1	7 gallons	7 gallons	14 gallons	28 gallons	28 gallons	14 gallons
2	14 gallons	14 gallons	28 gallons	56 gallons	56 gallons	28 gallons
3	28 gallons	28 gallons	56 gallons	112 gallons	112 gallons	56 gallons
4	56 gallons	56 gallons	112 gallons	240 gallons	240 gallons	56 gallons

Water the trees with 5 gallons of water immediately after planting.

Weed Control

Johnsongrass, bermudagrass, nutgrass and numerous other weeds are a major problem in establishing pecan orchards. Young trees go through a transplanting shock and cannot compete with weeds. It is important to control weeds early each year so young trees can obtain fast growth in April and continue to grow rapidly throughout May, June, July and August.

Control weeds by disking down each side of the row. Energy costs and drip irrigation equipment in the tree row have resulted in many growers using contact herbicides for weed control. Roundup®, Poast®, Fusilade® and Paraquat® are labeled for use on non-bearing pecans. Most growers are using Roundup® at a rate of 1 quart in 15 gallons of water per acre. Spray weeds until wet but not until runoff occurs. Treat a 6- to 10-foot diameter ring around each tree in April, June and September. By the third year apply the herbicides down the row. Once perennial weeds are killed pre-emergent herbicides such as Surflan®, Solicam® and Treflan® can be used effectively.

Nitrogen Fertilization

Nitrogen is necessary for rapid pecan tree growth. However, heavy nitrogen application can burn roots and damage young pecan trees. It is important to apply nitrogen in frequent small quantities during the tree's early life.

A grower can apply ½ pound of ammonium sulfate or ammonium nitrate to trees which are growing rapidly in June the first year. If the trees are not making rapid growth, do not fertilize the first year. Make April, May and June applications of ½ pound of ammonium sulfate or ammonium nitrate the second year if they are growing fast. Use 1 pound on the first of these months during the third and

fourth year. During the fifth through seventh year, use 2 pounds per tree. Nitrogen fertilization after June delays the onset of dormancy and encourages freeze injury. The last application must be made before the end of June. These recommendations are for rapidly growing trees only.

Irrigation

Irrigation and careful water management are essential for rapid orchard establishment. Pecan trees can stop growing when there is *too little* or *too much* water in the root zone. Drip, micro sprayers, low volume sprinklers, standard sprinklers and flood irrigation systems are adequate. Research by Dr. J. W. Worthington shows that a significant volume of soil moisture can be depleted by trees. Dr. Larry Stein has also shown that trees need moisture at least every 3 weeks or measurable stress results.

Seven gallons of water per week to 1-year-old trees are adequate for medium textured soils with good internal drainage. Extremely high temperatures, low relative humidity and high light intensity also increase the tree's water requirement if it is growing rapidly. Weekly or biweekly irrigations are better than daily irrigations. As trees increase in size, their water requirements increase. Use table 1 as a guide in determining the general water requirement for young trees on well-drained soil with drip or micro sprinklers. Reduce irrigation significantly in mid-August to facilitate the onset of dormancy. Freeze injury can occur in December if the water is not reduced in August. So water only twice in August and once in September. Winter irrigation is needed every 45 days if no rain occurs to prevent root death from drying out.

The rates given in table 1 may need to be reduced on clay soils to prevent water-logging.

Excessive moisture can be dangerous. If water is not draining internally, reduce the rate or discontinue irrigation for 1 week. When water forces oxygen out of the root zone, absorption is reduced, roots begin to die and tree growth stops.

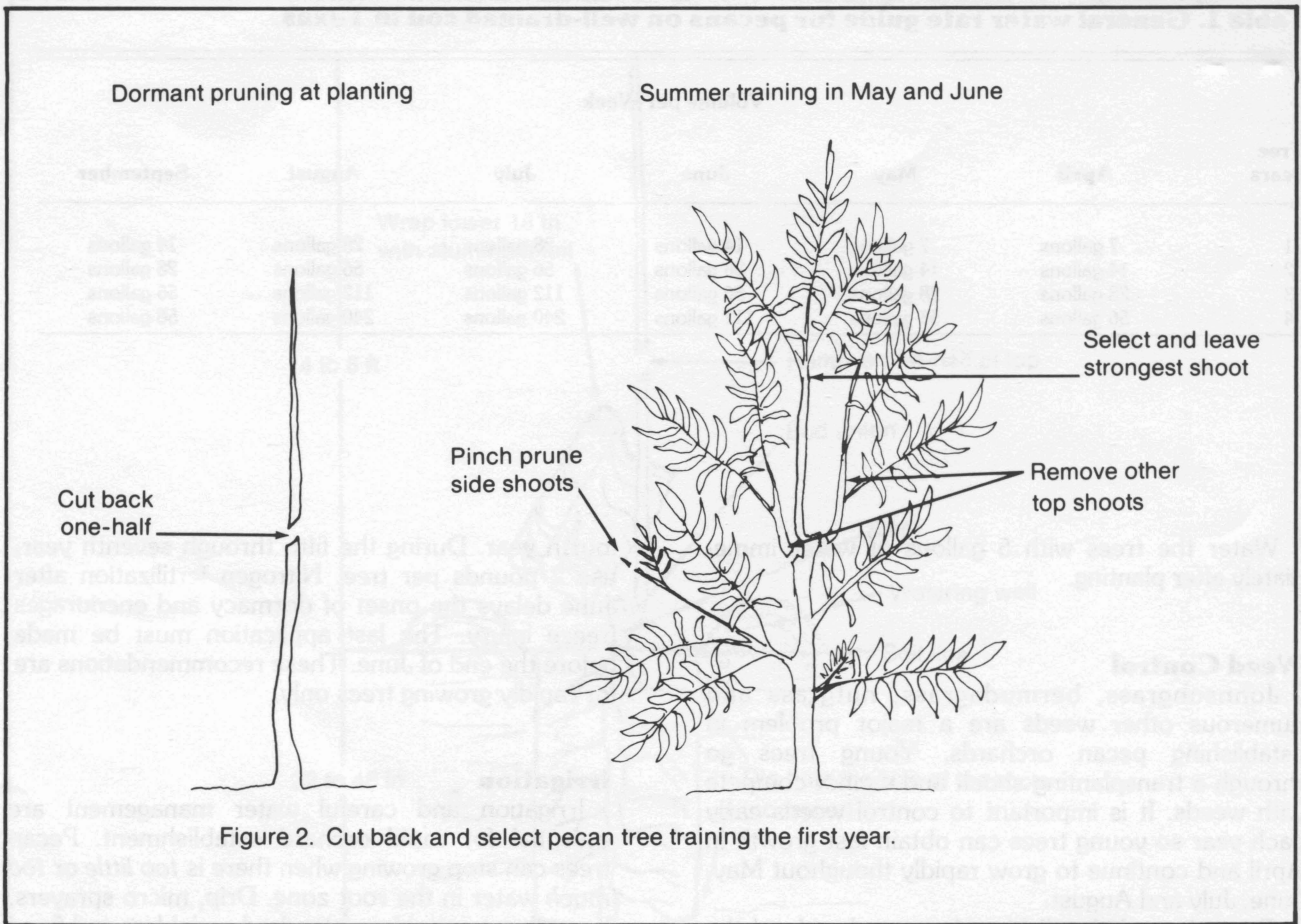


Figure 2. Cut back and select pecan tree training the first year.

Zinc Sprays

Frequent zinc sprays are essential for rapid tree growth. During the first 7 years, trees need foliar sprays of zinc every 2 weeks throughout the growing season. Make the last zinc application the first week in August. Frequent sprays are needed only if the trees are growing rapidly. If the trees are not growing, reduce the frequency.

Zinc sulfate at a rate of 2 pounds or NZN at 1¼ quarts in 100 gallons of water are standard recommendations. Higher concentrations result in foliage burn and are costly and unnecessary.

Prevent Freeze Injury

Young, rapidly growing pecan trees need to slow down in September and October to prevent freeze injury. This is accomplished by not fertilizing after June and reducing zinc and water in August. Sun scald from freezing can occur at the ground line on the south or southwest side of young trees in winter months. To reduce this type of freeze injury use aluminum foil or paint the lower 2 feet of the tree trunk with latex mixture.

Central Leader Training

Training a young grafted pecan tree to a central leader is very important but difficult. Native or seedling trees form central leaders naturally without training. However, budded nursery trees, especially Wichita, Tejas, Desirable and Choctaw, are difficult to train because of the "V" trunks. These "V" trunks are not acceptable because trees crowd early under high density spacing and are weak from included or trapped bark in the "V."

Slow growing young pecan trees are impossible to train. The tree will not respond to training unless it is healthy and growing rapidly. Training and shoot removal of slow growing trees can make the tree weak and do more harm than good.

All of the above cultural practices must be initiated with good tree response before attempting to train and prune a young tree.

First year training. Cut the tree trunk back one-half at planting (figure 2). In May or June select one shoot at the top of the tree to be the central leader. This shoot should be the strongest and most

Dormant pruning in January or February

Summer training in May or June

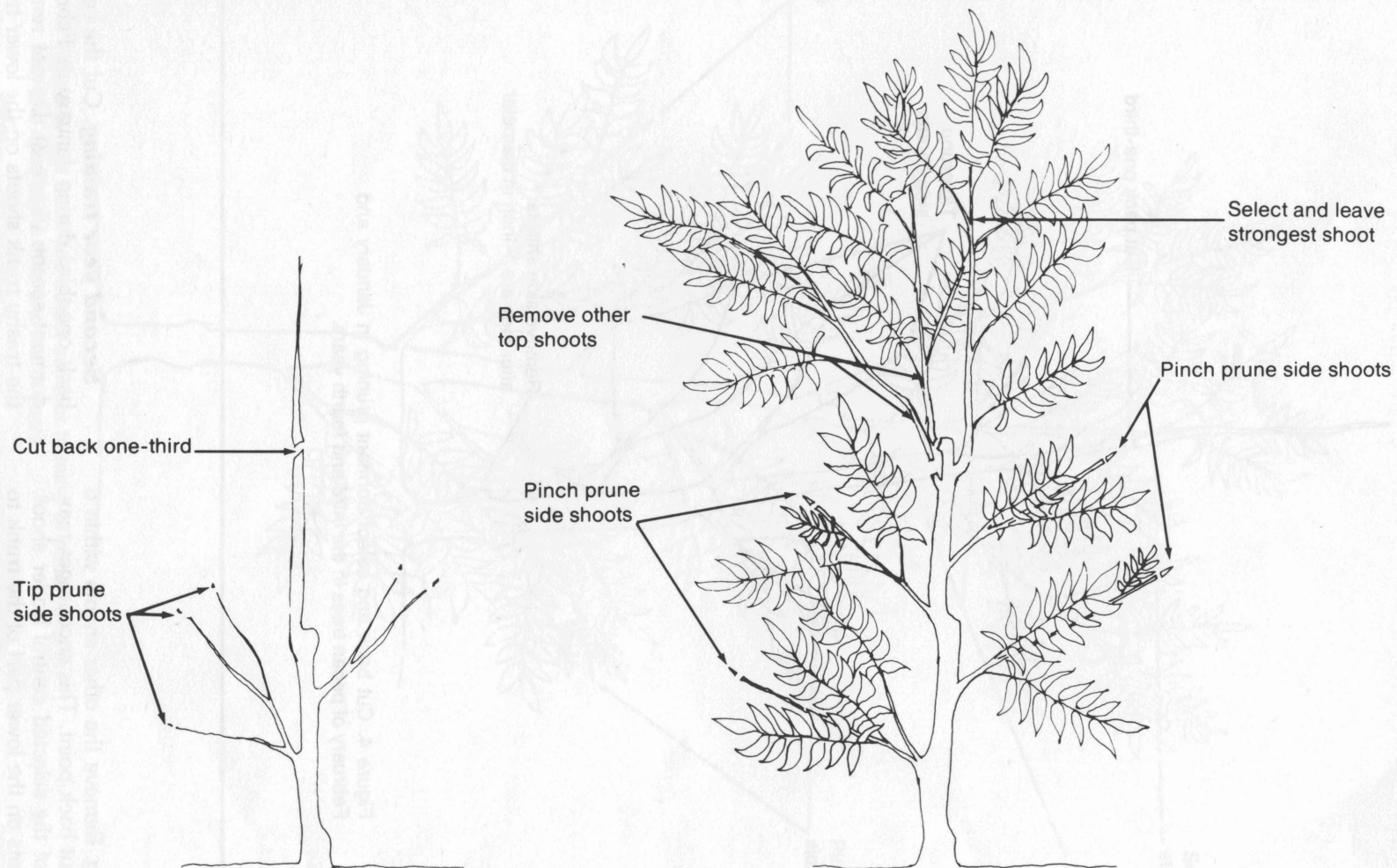


Figure 3. Cut back and select pecan tree training the second year.

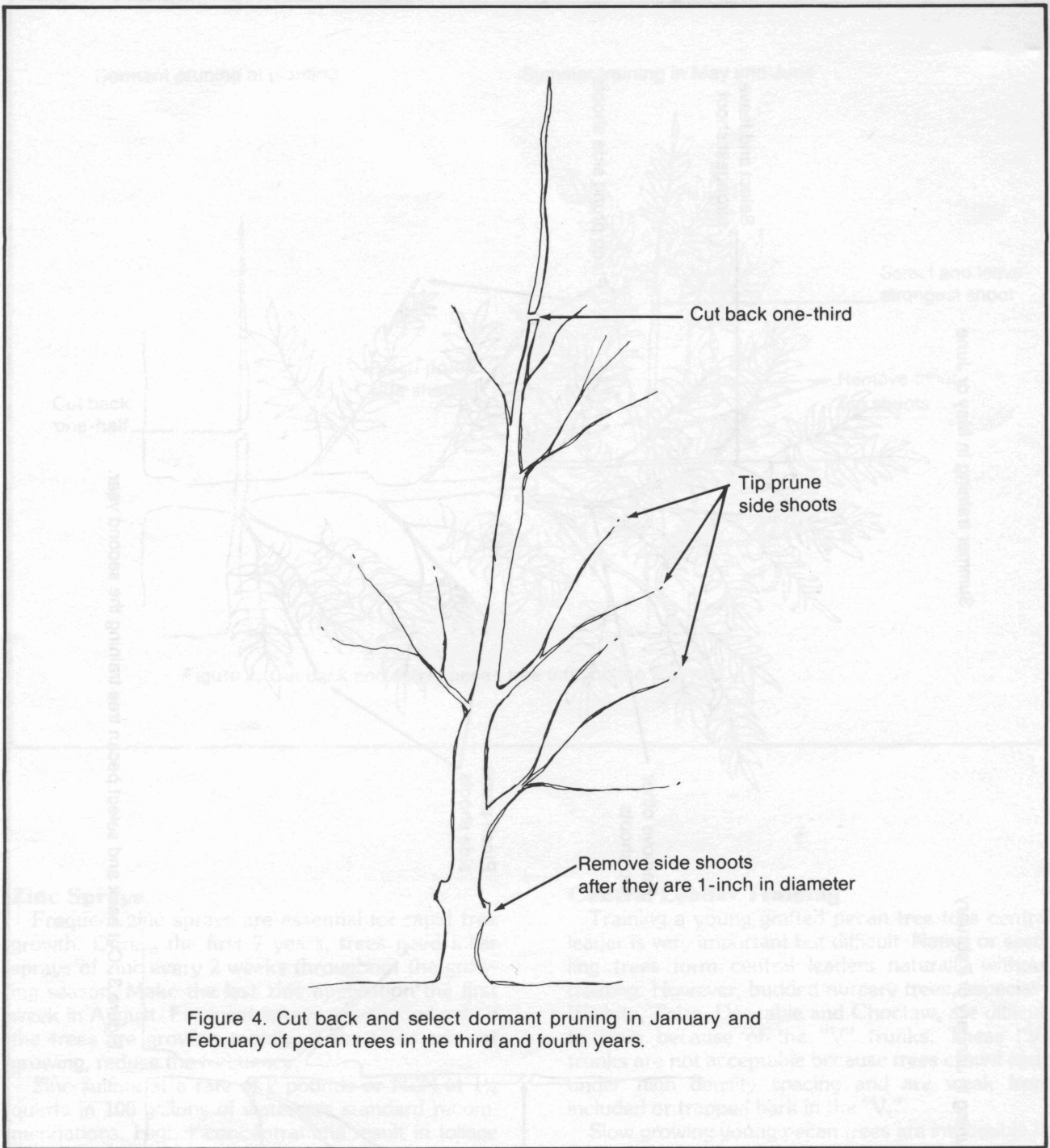


Figure 4. Cut back and select dormant pruning in January and February of pecan trees in the third and fourth years.

rapidly growing. Remove the other shoots within 6 inches of the cut back point. This encourages maximum growth of the selected central leader shoot. Allow side shoots on the lower part of the trunk to develop the traditional trashy trunk. If the other shoots at the cut back point are not removed in May, they can be cut out next February, but the central leader will grow less.

Second year training. Cut the central leader back one-third during January or February of the dormant season (figure 3). Do not remove any of the trashy trunk shoots on the lower trunk. If they are more than 18 inches long, tip prune by removing only 1 inch.

In May or June after growth is well underway, select and leave the strongest shoot at the cut back

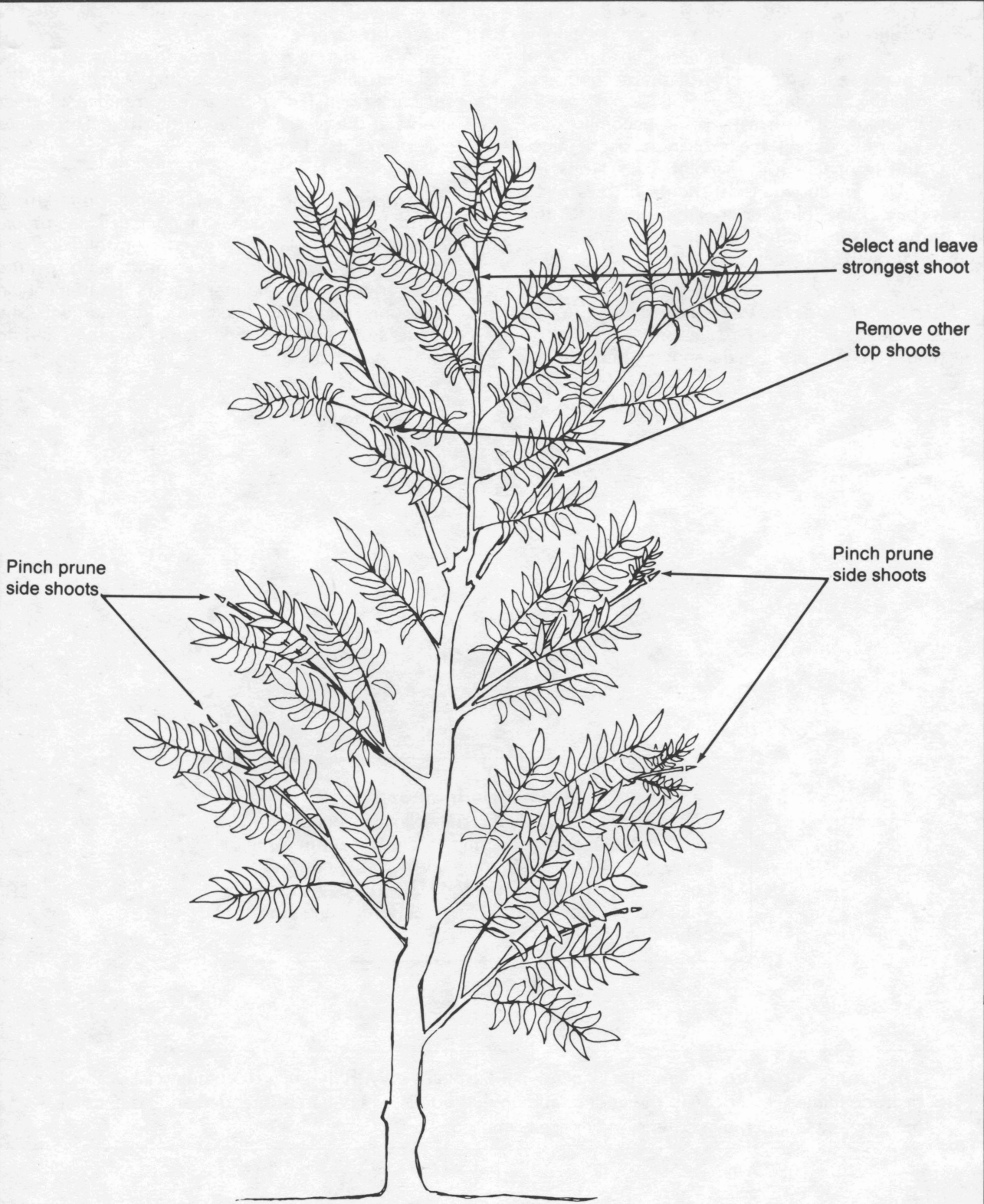


Figure 5. Cut back and select summer training of pecan tree in May and June of the third and fourth years.

point. This selected shoot will become the central leader. Entirely remove all other shoots developing at the cut back point. The central leader shoot should make much more growth the second year than it did the first year.

If side shoots of the trashy trunk become excessively vigorous during the growing season, pinch prune the terminal growing point. This stops the growth. Do not cut the side shoots of the trashy trunk back one-third or one-half because this encourages even greater side shoot growth which reduces growth of the central leader.

Third and fourth year training. Cut the central leader back one-third in January or February (figure 4). Tip prune side shoots. Remove the

lower side shoots which are 1 inch in diameter or larger at the trunk.

In May or June as rapid growth begins, select the final central leader shoot at the top of the tree at the cut back point (figure 5). Entirely remove all other shoots at the top 12 inches of the tree. This allows only one central leader.

Summary. The rapid establishment of a strong central leader tree depends on good soil, site preparation, proper planting, weed control, nitrogen applications, irrigation, zinc sprays and central leader training. For the first 4 years the tree should have only one central leader and a large trashy trunk. Never cut back side shoots one-third and do not remove them until they are 1 inch in diameter.

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