

Training Young Pecan Trees

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Figure 1. Young pecan trees

The primary objective for pruning a young pecan tree is to develop a strong trunk. To do that, I think it is important to understand how trees grow and how they respond to pruning and the environment. In the past, pecan trees always seemed grow in ways that work against our best pruning efforts to develop a strong central leader. However, if you follow the guidelines set forth in this guide, you'll learn to work with the tree and direct its growth into building strong tree trunk.

Understanding Tree Growth Habits

Most pecan growers have observed that training trees to a central leader would be much easier if the tree would only exhibit stronger apical dominance. The fact is, pecan trees have strong apical dominance but that dominance is not expressed in a way we expect or desire. In Figure 2, you can see how a pecan tree breaks bud in the spring. Note that there is a strong flush of new growth emerging from the apex of last year's

shoot while buds further down the stem are showing only the slightest bit of green. The cluster of new shoots is expressing apical dominance over the buds below. The lower buds are greening up only to allow catkins (male flowers) to emerge. Vegetative growth from these lower buds will be totally suppressed.



Figure 2 Spring growth pattern

Four new shoots are growing from the top of the shoot pictured above and if left to grow all season these four shoots will develop into a "crow's foot" branch pattern (figure 3). The development of a "crow's foot" at the top of a young tree destroys the central leader, diverting growth to 2-3 leaders (none of them growing straight up).



Figure 3. Crow's foot growth pattern.



Figure 4. Crow's foot growth pattern repeated year after year.

The way pecan trees break bud in the spring defines the structure of open grown pecan trees. In figure 4, you can recognize how, over the years, the "crow's foot" growth pattern can define the structure of a tree.

You may be wondering--"how in the world did those native pecan trees grow so straight and tall?" The answer is sunlight. Under forest conditions, competition is high and light is limited. The tree puts all its energy into growing a single shoot that can out-grow the competition and reach for sunlight. For open grown pecan trees, multiple shoots grow from the apex to take advantage of the full sun.

The 2 Foot Rule

The two foot rule is a simple way to remember how to prune young pecan trees during the growing season. There are three tenets:

- Keep the top 2 feet of the central leader free of lateral shoots.
- Limit lateral shoot growth to 2 feet per year.
- Prune out upward growing shoots on laterals.

The goal of this pruning system is to develop and maintain a strong central leader tree. Lateral branches are kept in bounds but not removed. It is important to maintain a large leaf area on the tree, maximizing the its ability to capture sunlight. The dense tree

canopy also catches more wind, causing greater growth in trunk diameter.

The before and after photos in Figure 5 demonstrate the 2 foot rule in practice. Notice a well-defined central leader and compact laterals after pruning.



Figure 5. Before and after pruning with the 2 foot rule.

Corrective vs. Directive Pruning

The traditional time for pruning pecan trees has been during the dormant season. In Figure 6, you can see a before and after view of dormant pruning. Dormant pruning is *corrective* pruning. Notice that almost all pruning cuts were made to correct the problem of "crows" feet. When pruning during the dormant season, you just have to hope one of the branches in the crow's foot is heading in the right direction. There appears to be a central leader in this tree but it is far from being well defined or dominate. When this tree breaks bud in the spring, a whole new crop of crow's feet will develop.



Figure 6. Traditional dormant pruning: Before and after.

In contrast, summer pruning is *directive* pruning. We use our knowledge of pecan tree growth patterns to prune the tree during the growing season to direct new growth into desirable directions. Starting shortly after bud break, when new shoots are about 6 inches long, we can define the growth of the central leader with a single snip of the clippers. The photos in Figure 7 show the terminal of a young tree before and after summer pruning. A single pruning cut (red line marked A) removes all competing terminal shoots, directing all of the tree's energy into growing a single strong shoot that will grow straight upward and become a dominate central leader.



Figure 7. Defining the central leader with a single snip.

Don't forget the two foot rule when pruning the spring flush of new growth . The photos in figure 8 show the before and after pruning views of the same terminal shoot pictured above. Notice that I pruned off all lateral shoots within the top 2 feet of the terminal.



Figure 8. Practice the 2 foot rule on the terminal.



Figure 9. Direct the growth of lateral branches by pruning to outward pointing buds.

I also make directive pruning cuts on the tree's lateral shoots. During the early spring flush of growth, the terminals of lateral branches will sprout several new shoots. Remove any new shoots that point upward.



Figure 10. New shoots emerge in response to tip pruning.

When new growth on lateral branches has reached 2 feet in length tip prune the shoot to a bud that is pointing downward (Figure 9). Tip pruning lateral branches helps to change the tree limb's focus from shoot extension to radial wood growth (the limbs get thicker). Tipping also promotes dormant buds on older wood to break (Figure 10), ultimately leading to a foliage dense canopy.

The Problem of Stalked Buds

Early summer pruning and the forcing of rapid central leader growth can promote the development of stalked buds. Stalked buds are primary buds that form on short stems (Figure 11). If stalked buds are allowed to grow into lateral shoots they will form a weak branch attachment characterized by a bark inclusion. The best way to explain how stalked buds grow into problem branches is with a series of photos.



Figure 11. A stalked bud on a fast growing pecan shoot.



Figure 12. A stalked bud that has grown into a small lateral shoot

In Figure 12, a stalked bud has grown into a shoot 8 inches in length. Notice how a bark inclusion is already starting to form on the upper side of the shoot. Also in the photo is a leaf petiole (below the stalked bud shoot) and a secondary bud (between the stalked bud and petiole).



Figure 13. A deep bark inclusions and weak branch attachment

Allowed to grow much larger, a stalked bud develops into a branch with a weak branch attachment and deep bark inclusion (Figure 13). Weakly attached lateral limbs should be avoided when training young pecan trees. Limbs with deep bark inclusions tear easily from the tree, creating a huge scar on the trunk. In addition, when limbs with a deep bark inclusion are pruned off during normal "limbing up" operations, the pruning wound left behind does not

callous over well. Without a well-defined branch collar, the tree has a hard time growing over the bark inclusion.



Figure 14. stalked buds on spring growth

If you prune a pecan tree during the spring to force the growth of a central leader, by June you should see strong growth and the development of stalked buds (Figure 14). This central leader has grown over 2 feet in height since I pruned to a single leader 5 weeks earlier and all this new growth is covered with stalked buds.



Figure 15. Stalked buds on the central leader

Figure 15 is a close up of the same central leader. Notice that some of the stalked buds have even started to grow into lateral branches. The good news is that if you continue to practice the 2 foot rule you should end up pruning all of the stalked buds off the central leader. Often times the stalked buds are so green and tender that you can just pull them off by hand without using a pruning shear.



Figure 16. Secondary buds develop wide angle branches.

As the tree continues to grow, you should note that the lateral branches that develop below your 2 foot central leader are actually developing from secondary buds left behind when the stalked buds are removed. Note in Figure 16, you can see the pruning wound left behind after removing the stalked primary buds. Below that, secondary buds have broken and developed into well angled lateral shoots.

When to start training

Many pecan growers start to prune young pecan trees too soon after transplanting. In my experience, a recently transplanted pecan tree seems to just sit there, growing only 4-5 inches of new shoot growth in the first year (Figure 17). What you don't see is the rapid

growth that is taking place under the soil surface. Newly transplanted trees grow roots, regenerating a strong tap root (or tap roots) and developing a network of lateral roots. To support active root growth, trees need plenty of leaves to capture the sun's energy and create the carbohydrates needed to build root tissue.



Figure 17. A newly transplanted tree with no sign of rapid shoot growth.

During the root regeneration phase that follows transplanting a young tree, do not prune the top of the tree. Pruning at this point only serves to remove leaf area and slow down root growth. Pecan trees will tell you when they are ready to be trained. Two to three years after transplanting, the top of the tree will suddenly explode with new shoot growth (especially with proper weed control and adequate soil nutrition). This is the tree's signal that the root system has

become well established and the tree is ready to be trained.

That brings us to the next 2 foot rule. When a tree grows at least 2 feet of new shoot the previous season it is time to either graft a seedling tree or train a grafted tree. The tree pictured in Figure 18 is ready for grafting. Several of the shoots grew over 3 feet the previous year and even sprouted some lateral shoots from stalked buds. Note that this tree looks like a training disaster--limbs growing every-which-way and no strong central leader. This is a seedling tree that will be grafting soon after bud break. So we will cut the tree off, right under the 1st whorl of branches and set a bark graft at that point.



Figure 18. Rapid shoot growth signals the best time for grafting.



Figure 19. Scion and stump sprouts grow rapidly in early Summer.

Training young trees starts by applying the 2 foot rule right on the growing graft. In Figure 19, you can see that a vigorously growing seedling tree will push both the scion and stump sprouts to grow rapidly. Find the strongest growth shoot growing from the scion and prune all others out. This shoot will be the new central leader. Prune off all the stump sprouts unless your central leader has already grown 2 feet in height. Following the 2 foot rule, you can leave a lateral shoot on below the graft to help provide leaf area to support the root system (Figure 20).



Figure 20. A new graft pruned using the 2 foot rule.

Use a stake to train your central leader (I use bamboo). The stake also provides a place for birds to perch so they don't land on the tender new growth of the central leader and damage the growing point.

Training a young tree that grows rapidly is relatively easy using the 2 foot rule. It just requires paying attention to details and a monthly inspection (and pruning when necessary) of your trees from May thru July.

Summing up

The goal of training a young tree is to develop a strong straight trunk. I have developed the 2 foot rule to help you achieve that goal. The results of following the 2 foot rule should be a well-balanced tree with a strong central leader (Figure 21). To achieve these results you will need to:

- Maintain rapid tree growth with weed control and soil nutrition
- Make pruning cuts from May until early August using the 2 foot rule
- Don't be in a hurry to limb-up the tree. Leaves help create a stronger trunk.
- Remove lower lateral limbs when they get about 1 inch in diameter
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Figure 21. A well balanced tree pruned using the 2 foot rule.

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