

# Shedding Light on Pruning Orange Trees

by Roger Smith

Hand pruning orange trees has always been intriguing for me. My Dad's training in Citrus Fruit Production at Cal Poly, San Dimas in the late 1940's taught him that "you don't need to hand prune an orange tree." As I went through college and started to discover literature on the topic, I uncovered quotes that supported Dad's training like "pruning has been looked upon by some as the least necessary of all cultural operations." (1) Yet, when I started working in the citrus industry I discovered many progressive and successful growers that consider hand pruning an important component of their cultural operations. This seemingly opposing set of viewpoints sent me on a three-year odyssey to figure out pruning philosophies. What follows are my discoveries.

## ASSUMPTIONS

1. The emphasis is on hand pruning, not mechanical pruning.
2. We'll assume a grower doesn't have unlimited resources.
3. Citrus physiology won't be detailed. Study the references listed at the end of the article for more information.
4. This is not a "How To" presentation. The details provided here are meant to create a perspective regarding pruning. It is not meant to relate the optimum practices.
5. We are only talking about pruning orange trees. Lemons, Minneolas, mandarins, and grapefruit are not considered here.

## CLASSIFYING PRUNING

Pruning has two primary affects on a citrus tree. It changes apical dominance, which stimulates development of new growth, and it changes light distribution. "Practically all the beneficial effects of pruning relate to one or both of these primary effects." (2) With this in mind, we can group pruning of oranges into three categories.

- I. Tree size and shape control.
- II. Dead brushing.
- III. Improvement of fruit production and fruit quality.

Understanding these three categories helps a grower focus on what he needs to accomplish for a particular grove. Each orange grove is unique. Tree spacing and influences on tree vigor such as rootstock, cultivar, soil, geographic location, tree age, and tree health all combine to create unique tree canopies in different blocks. When a grower looks at a block, it helps to categorize or classify what kind of pruning

needs to be done initially to avoid cost overruns in a single year. Let's expand the above categories.

**I. Tree Size and Shape Control.** Optimum tree size depends on the grove, but the important consideration is the amount of light needed for the production of fruit wood throughout the tree's canopy. Mechanical topping, hedging and skirting are the primary methods for tree size and shape control for most growers. This is often supplemented by light hand pruning when needed. How often trees are mechanically pruned is strictly an economic decision. If you have your own equipment, annual mechanical pruning can be very successful. This is often too expensive if you have to pay for custom work and this may be the first influence on how your overall pruning program is managed. Acceptable production and fruit quality can be achieved with no other pruning practices.

**II. Dead Brushing.** Dead brushing can be defined as the process of removing the shaded out or non-productive wood from the inside of a tree's canopy. This practice improves spray penetration, removes dead wood that could harbor disease, helps light filter into the wall of the tree and reduces wind scarring on fruit. A common mistake when dead brushing is allowing the pruning crew to take off too much potential fruit wood. Dead brushing is especially important on younger trees that have started to shade out older wood. It is important to recognize that the purpose of dead brushing is not to increase the amount of inside fruit (see III). A grower that doesn't hand prune very often should still dead brush to improve spray penetration and remove dead wood and crossing branches, but would not want to encourage too much interior sprouting in order to avoid returning to dead brush too soon.

**III. Improvement of Fruit Production and Fruit Quality.** *This kind of pruning is the most intensive of all pruning procedures and may not be for everyone.* This method can cost up to \$300 per acre to initiate and \$150-\$250 per acre to maintain. In most cases, it is required annually and commonly incorporates mechanical pruning and dead brushing, but takes two more essential steps: "opening a hole," and suckering. The goal of this kind of pruning is to increase light penetration to the interior of the tree's canopy to encourage sprouting on the scaffold branches. This intends to increase the amount of fruit wood inside the tree to maximize fruit quality and to improve fruit size. When done annually, over time, this process may also increase overall production.

## PRUNING, POINT BY POINT

Now that we've classified pruning, let's discuss some key points regarding pruning in California.

**POINT 1: Pruning is the "least necessary of all cultural operations." (1) Hand pruning orange trees is not essential for acceptable production. It's essential for optimum production. This is a very important point. Pruning is the "least necessary of all cultural operations," but that does not mean it's unnecessary. Much of the old literature on pruning can be misleading because it seems to make such a strong case for not hand pruning. This information is not wrong, because in some cases pruning certain groves would be a waste of money.**

**POINT 2: Don't pursue a hand pruning program until the grove is performing at an acceptable level. Pruning is not a cure-all and it can waste resources.**

Since hand pruning can cost \$120-\$300 per acre or more, before considering pruning it's important to invest farming resources on the essentials first. "There is a limit to what pruning can achieve. It is absolutely imperative to first address the factors most limiting tree performance." (2) It's not uncommon for citrus growers to waste money pruning weak groves that eventually end up being pushed out. To avoid wasting money on hand pruning, first spend resources on the following:

1. Optimum irrigation control.
2. Optimum nutritional program.
3. Optimum root health and disease control.
4. Adequate pest control practices.
5. Property is fully planted with few "holes in the grove."

In other words, make sure the grove is healthy before a hand pruning program is initiated. Save money for the farming essentials to get acceptable production before going after optimum production.

**POINT 3: Pruning reduces production.**

Citrus Industry Vol. III states that "most experimental work on citrus pruning has indicated that yield of healthy trees is reduced in proportion to the severity of pruning." (1) If yields are reduced then why prune? The answer, because yields are better than an unpruned tree the year after pruning due to the rejuvenation effect pruning stimulates. It also helps set more interior fruit that is of higher quality and value.

**POINT 4: Pruning can increase production and fruit quality over an unpruned tree the year after pruning.**

**POINT 5: Prune after the threat of frost in late winter and early spring. Try to prune before bloom or before a natural flush period.**

“Perhaps the most appropriate time of the year to prune citrus trees that are not carrying a crop is late winter or early spring when the danger of frost is past.”(3) *“The rule is to prune as soon after harvest as possible (emphasis added). Winter pruning capitalizes on the ‘floral’ field conditions (fruit bud differentiation) existing at that time. Resulting inflorescences tend to be leafy, which benefits fruit set and size.”*(2) Some think Valencias should also be lightly pruned during this period, which means before they’re harvested. “One view expressed is that citrus trees should only be pruned to accentuate a flush that would normally occur naturally at that time of year.”(2)

**POINT 6: Light pruning is advantageous and may improve fruit size. Consider that to prune lightly, an annual pruning program may be necessary “as part of a well-rounded program of citrus management.”**(1)

Examine these quotes from Citrus Industry Vol III. I’ve added Italics for emphasis. “Most experimental work on citrus pruning has indicated that yield of healthy trees is reduced in proportion to the severity of pruning. *There may be some situations where light hand pruning or thinning will prove advantageous for such trees.*” (pp.216) “Whether trees are young or old, pruning is repressive to growth and fruitfulness almost in direct proportion to severity and frequency of treatment. *Pruning may or may not improve fruit size,* but the decisive factor appears to be the relationship between the vigor of the trees and the amount of fruit they carry.” (pp.218) “Pruning in the culture of citrus should be looked upon *as a measure that may be helpful under a specific set of circumstances or as part of a well-rounded program of citrus management.* Pruning should never be indiscriminate, since removal of more than moderate amounts of healthy foliage seriously delays growth and fruiting of young trees and reduces the yield of mature trees.” (pp.213) Simply put, prune lightly as part of a management plan.

**POINT 7: Implement a hand pruning program gradually. The loss of production and the costs are too prohibitive if incurred all in one year. Once initiated, stick with it on an annual basis.**

Growers that have maintained hand pruning programs for many years all agree that it’s tough to quantify its value statistically. They also agree that it’s expensive to initiate on a mature grove that has never been hand pruned. Even so, the quality of their fruit over the long-term has supported their resolve to maintain an annual hand pruning program. The key, they say, is to implement a hand pruning program gradually and to remember POINT 1 before you do.

**POINT 8: Cut lightly on a mature citrus tree every year.**

Hand pruning proponents agree that you need to cut on a mature citrus tree every year to make sure it’s putting on a good amount of new growth. This means different things to different growers, but often if a tree is mechanically pruned, the amount of hand pruning may be less for that year. Remember, it depends on the particular grove.

**POINT 9: Increasing light into the tree by “opening a hole” or window is key to a class III program.**

If the decision is to establish a class III pruning program for a mature grove, consider that this kind of “pruning releases buds on previously shaded, dominate wood and enables them to sprout and flower. New shoots then arise directly from or near thick wood. This wood forms a highly accessible, physically strong ‘pipeline’ which strongly promotes fruit growth and leads to improved fruit size.”(2) The important elements in this kind of pruning that separates it from dead brushing is the effort to “open a hole” or “create a window” in the tree to increase light to the scaffolds. This step must be followed by removal of vigorous shoots that are “light robbers” while retaining high quality, “leafy new stems, close to the scaffold branch pipelines, well-lit, and low enough to pick easily.”(2) To work effectively, this type of pruning must be done annually with a well-trained and motivated pruning crew. A good crew is essential to the success of this kind of program because they must be able to make the right decision on every tree they prune. Pruning too much or too little could prove to make the program a waste of money.

**POINT 10: When performing a class III program, it’s important to remove “light robbers” at least once a season. Some vigorous groves may need it twice a season. The late summer or early fall may be the best timing because the light will be available for bud differentiation in January.**

**POINT 11: A well-trained, well-supervised and motivated pruning crew is essential for a class III program. Using the best workers off of a picking crew may be a good choice since they can actually see the results of their work when they pick the crop the following season.**

**POINT 12: Avoid pruning young trees until they begin to approach at least 8-10 feet in height (4-6 years old). Young trees are naturally vegetative and don’t need to be pruned to stimulate development of new growth for fruit production.**

“The pruning of young nonbearing trees has shown to delay initiation of fruiting, whereas severe pruning of young bearing trees often stops fruiting, with formation of new foliage replacing the production of fruit.”(1) “Small irregularities in young trees should be ignored, since citrus habitually grows in this manner and young trees usually become symmetrical within a few years.”(1) When pruning a young tree “what might appear to be an excellent choice for a main branch one year may fail to continue growth the next.”

## FINAL THOUGHTS

I’ve attempted to paint a picture of pruning orange trees. I wish it were possible to lay out the “perfect orange tree” and encourage growers to copy it, but there are too many variables within the industry to offer that option. A grower can make the “perfect tree” if he decides to make pruning a part of his program early in the development of a young grove. One person’s “perfect tree” may not be the same as another’s, but the key is laying out a pruning plan before the decision is made on the spacing of the grove. Answer these questions when considering your “perfect tree.”

- What is the radius from trunk to outside canopy that you want to maintain?
- What tree height do you think is best?
- Are you planning on skirting?
- Is it important to allow light to reach all sides or do you want a hedge-row?
- Does diamond planting fit into your plans?
- How many dollars/acre do you want to spend on hand pruning?
- If you’re double-planting, what spacing do you want the ultimate grove to be?
- How often do you want to top and hedge?

The wider the spacing, the less that needs to be done to maintain light penetration into the grove. The wider the spacing, the less trees per acre and the easier it is to farm. The wider the spacing, the less trees per acre and the less potential production per acre. The tighter the spacing, the more production and the decision to prune is more important as the trees start to crowd.

Pruning is not a cure-all, but it is a valuable tool of the citrus grower. The key to success is careful planning, understanding your grove’s priorities, having a well-trained pruning crew, and evaluating your plan. Whatever you do, remember, pruning is the “least necessary of all cultural operations,” but it can be the best investment you ever make in your healthy grove.

**REFERENCES** (available on the web at [www.citrustreesource.com](http://www.citrustreesource.com))

- (1) Lewis, Lowell N. & McCarty, C. Dean, Pruning and Girdling of Citrus, *Citrus Industry Vol. III*, pp211-218.
- (2) Krajewski, Dr. A.J., Pruning Citrus in Southern Africa: A Hacker’s Guide. 1996.
- (3) Kalsen, C. 1995. Pruning in the San Joaquin Valley, *Citrograph Vol. 81*.
- (4) Cadman, Ralph, Pruning Systems for Improved Citrus Quality, *Australian Citrus News*, Nov. 1986.



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