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## PRUNING AS A COST SAVING METHOD

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Pruning is one of the most powerful techniques used in tree fruit production. It has direct effects on tree growth and fruiting and can massively alter orchard light interception as well as the overall form and shape of the tree. With labor costs increasing, and fruit prices static to declining, it behooves managers to evaluate each part of the growing system, and especially that of dormant pruning and its effect on thinning/cropping. Germane questions to this end include, how severe can we, or should we, prune trees; how tall do trees need to be; will production suffer in shorter orchards; and can vigor be practically managed in shorter orchards?

### **Pruning Severity And Thinning Effect**

Pruning can be looked upon as an “early” fruit-thinning practice. Fruitwood removal can be attained by either thinning cuts or heading cuts. Thinning cuts are preferred with respect to fruit bearing hangers since they are less likely to produce a vigorous growth response. In a comparison of heading and thinning cuts to reduce crop load in MayGlo nectarine, heading cuts reduced fruit size and delayed color and maturity.

Growers should challenge themselves to ensure that they are pruning mature trees severely enough. To test this concept, select several trees and remove an additional 25% to 50% of the fruitwood. At thinning time compare the fruit size and crop load of these trees with the other trees in the orchard. Attempt to thin these trees to a similar crop load and then compare again at harvest.

This technique is especially attractive on heavy-setting varieties of peach/nectarine. For example, assume a variety for which the standard crop load is 600 fruit per tree, and 3 fruit per shoot are left normally (200 hangers per tree). By upping the crop load to 4 fruit per hanger only 150 hangers need be left – a 25% reduction in initial crop load. Going to 5 fruit per hanger achieves a 40% reduction in initial crop load. Both scenarios have the potential to increase fruit size at both thinning and harvest, as well as providing direct reductions in thinning labor. Note that this technique may require that one abandon the conventional wisdom that a particular variety must only be thinned to “three,” or some other given number of fruit per hanger. Using this method the emphasis is placed on total fruit per tree. When used within reason this method has been very effective.

### **Limb Removal**

Evaluate orchards to ensure that there are not too many secondary and tertiary scaffolds. This is a common problem in many older orchards – especially plums. Considerate limb removal can do wonders in these situations. Benefits to such a practice include: improved light penetration to the lower portions of the tree, reduced initial crop load, reduced thinning costs, consequent improvement in fruit size and possibly even color, and a possibility of compressed or reduced number of harvests.

## **Tree Height**

The prime bearing area in a tree is the upper 3 to 5 feet of the canopy. It is in this zone that fruits are the largest, best colored, and of highest overall quality. As one progresses further down the canopy fruit quality attributes decline. These differences are the result of differing light regimes proximate to the fruit. Our goal should be to manage this zone as close to the ground as possible, while ensuring that overall fruit quality is not reduced. And with the increasing emphasis on fruit size and quality, a consideration can even be given to the concept that reduced yields may be acceptable given improvements in fruit quality percentages.

An obvious method of reducing overall labor costs in orchards is by reducing tree height. Studies have demonstrated that ladders add about 20 to 30% to the cost of any operation in which they are involved. Our studies have shown that there is potential for tree height reduction in many instances but that care must be taken to insure that orchard light interception is not compromised by these reductions. Yields were similar between short (8 feet high) and tall (12 feet high) trees in two out of three years, but reduced significantly in the other. Care must be taken to ensure that adequate amounts of fruitwood are left after dormant pruning. Vigor management in such orchards becomes absolutely critical, and proper consideration must be given to nutrition and irrigation regimes. While tree needs must be met, it is best to err on the side of too little as opposed to too much growth.

Intermediate reductions in tree height can be safely made as long as two conditions are met, 1) no drastic change in effective light interception by the orchard, and 2) sufficient fruit bearing area is left on which to carry a crop. If both these conditions can be met, a reduction in tree height can be performed.

## **New Orchard Planting Considerations**

For those who are considering trying some techniques for labor/tree height reduction in new and developing orchards the following suggestions are offered.

- Spacing – consider going to a closer spacing using rows that are 15 or 16 feet wide. Effective tree forms are 4 leader and 6 leader V-shaped trees at 9-12 feet down the row. These multiple major growing points are necessary to help control vigor. There is no need to go to higher densities than these.
- Tree Height – keep tree height in the 9 to 11 foot tall range. While ladders are not entirely eliminated, dependence upon them is drastically reduced. Additionally, shorter ladders (6 or 8 foot) that are lighter and easier to maneuver can be employed. In such orchards operations like summer pruning can be performed entirely from the ground.
- Varieties – early and mid-season varieties are probably the best place to begin. Avoid heavy bearing late season varieties until more is known about orchard behavior. Also, varieties of low to moderate vigor will be easier to adapt to these systems.
- Light/Vigor Management – these should almost be considered as one and the same. Proper summer pruning is necessary to ensure a good light environment within the tree, and excessive vigor will increase the need for summer pruning. By reducing nitrogen applications the need for summer pruning is reduced. In vigorous orchards machine topping can be used, but may need to be performed twice. If so, the first topping should be performed at about 1 to 1 ½ feet higher than the ideal permanent height of the tree. The second topping is then made 30 to 45 days later at the desired overall height. This method will help to “soak-up” some of the excessive vigor.