

## Methods for Improving Fruit Size in Southeastern Peach Orchards



Photo by: Sherman Morton

A seasonal concern of fruit growers is that of improving yields, particularly through improving fruit size. Over the last several years, we have conducted studies and observed the work of others concerning the improvement of fruit size in peach.

### Girdling

Several decisions that effect fruit size can be made early in the season. First is a decision to girdle the tree to increase the sugars in the upper part of the tree supporting fruit growth, earliness and color.

When knife girdling (conducted at pit hardening) is used in a single year, we have observed increases in fruit size approaching 20% in most years if adequate irrigation is provided (Taylor, 2004 and Taylor and Bacon, 2006). While knife girdling of a tree in a subsequent year will increase fruit size relative to non-girdled trees, it will actually decrease overall yield of the tree, suggesting that the tree is excessively stressed by repeated use of knife girdling.

Ideally, horticultural methods will improve fruit production without harming overall tree health. To that end, we have found that application of cable ties to tree trunks in the fall for early peach varieties and in the dormant season for mid-season and late peach varieties improves fruit size and yield by 15% compared to non-girdled trees and that repeated girdling with cable ties will continue to improve fruit size and yield at similar levels if adequate irrigation is provided. The ties should be removed at the end of harvest, allowing a recovery period for movement of resources to the roots that were somewhat deprived during fruit development.



Figures from left to right demonstrate pruning decisions that improve fruit size and yield.

1. Remove all vigorous growing water sprouts with greenish-brown bark
2. Remove all wood that is two years or older from the main scaffolds with grayish-tan bark
3. The shoots that remain on each scaffold should only be red-colored, growing directly from the main scaffolds of the tree

### Pruning

Another early season decision to improve yield by improving fruit size is to prune trees to a level that will reduce the number of fruit that must be removed from the tree during a thinning

operation. This idea is the result of work reported by Marini (<http://www.ext.vt.edu/pubs/treefruit/422-020/422-020.html#L7>) and cited in (Byer et al, *Hort. Rev.* 28: 351-392.). Marini reports that the best crop value is attained with pruning trees of mid-to late season varieties to 70-85 fruiting shoots per tree, retaining 550-600 fruit on those shoots. By pruning rigorously, the number of competing growing points (whether flowers, young fruit, leaves or shoots) is reduced early, allowing resource allocation primarily to the fruit that will be retained until harvest. An additional advantage to this method, is that less money is expended in the weeks that follow on thinning the crop, with only 25-30% of the level of thinning required compared to trees where more than 120 shoots were retained during pruning.

The thinning of the crop early and adequately is essential to increasing fruit size. It is possible, that if the two techniques discussed above are employed, a few more fruit can be carried on the tree and brought to adequate size for the market. This can be determined with experience. Of course, care must always be taken in the spring to leave some extra fruit on the tree as a hedge against a late frost event. Some approach this by thinning to about 2 crops worth of fruit and coming back to remove more later. Others may use the pruning technique describe above to bring the crop level down to about 1.5 times as much as needed and coming back for a final thinning closer to the time at which frost danger is ending.

## Spraying

Some chemical techniques have been shown to improve yield by increasing fruit size. The harpin protein, Messenger, sprayed on the tree at 6 ounces/acre has increase yield from 7 to 27% depending on the rainfall level (Taylor, 2006). We have noted that the increase in fruit size and retention increases with increased rainfall from year to year when Messenger was applied. We have also found that when calcium is applied throughout the season from bloom until harvest, it not only improves fruit firmness and reduces post harvest disease, but it also improves fruit size if it is applied as an metal-amine chelate (Calcium Metalosate) (<http://www.albion-an.com/plantconf/2008/04-KathyTaylor-Peach-2008.pdf>). The nitrate form had no effect on fruit size, while the chloride form slightly reduced fruit size (but had the best impact on disease reduction).



While we have yet to attempt to employ all of the described techniques to accomplish fruit sizing, it is clear that there is certainly a menu of options. One or more these would likely fit into any production scheme for the benefit of the crop and the grower's bottom line.

Byers, R.E., Costa, G., Vizzotto, G. 2003. Flower and fruit thinning of peach. and other Prunus. *Hort. Rev.* 28:351-392

Taylor, K.C. 2004. Cable-tie girdling of peach trees approximates standard girdling results. *J. Amer. Pomological Soc.* 58(4):210-214.

Taylor, K.C. 2006. Harpin protein application impacts fruit yield, size and retention of peach fruit. *Acta Hort.* 713:237-242.

Taylor, K.C. and M.A. Bacon. 2006. Non-injurious girdling of peach trees to increase size, brix and earliness of peach fruit. *Compact Fruit Tree.* 39(3):25-28.

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