

# Integration of Tree Spacing, Pruning, and Rootstock Selection for Efficient Almond Production

## Project Leader: Roger Duncan

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## PROJECT SUMMARY

### Objectives:

In support of a major ongoing 20-year project:

- Continue to evaluate the interactive effects of three key management factors—tree spacing (planting density), rootstock selection, and training/pruning techniques—on tree size, structural integrity and short-term and long-term yield in almond orchards.
- Continue to evaluate the associated economic advantages and disadvantages.

### Background and Discussion:

To prune, or not to prune?

How close is too close?

This project attempts to answer these questions by integrating various pruning strategies with different planting densities in the same orchard. The Nonpareil and Carmel varieties are planted 22, 18, 14 or 10 feet apart down the row while the rows are all 22 feet apart. The four pruning strategies range from selecting three scaffolds and pruning every year to not selecting any scaffolds and not pruning at all except for safety and equipment access.

After fifteen years, much of the story remains the same. Annual pruning has not increased or maintained yield. In general, the more trees have been pruned, the lower the cumulative yields have been. Surprisingly, annual pruning has not improved light interception through the canopy. Generally, the canopy in annually pruned trees

appears to be declining a little faster than unpruned trees.

Annual pruning would have conservatively lost over \$7000 per acre so far when considering the reduction in yield (at \$1.50 per pound) as well as the cost of pruning, stacking and shredding the brush every year. At current almond prices, lost revenue would be much higher.

Worth noting, during the early development years untrained trees and trees trained to multiple scaffolds were more susceptible to blow over and scaffold failure than young trees that were trained. One solution would be to train the trees during the initial two years and then subsequently reduce or abandon pruning activities.

Counter to expectations, light interception (and thus yield potential) in the orchard appears to be declining earliest and fastest in the most widely spaced trees. In general, the closer that trees are planted, the greater the short term and long term yields.

The most closely planted trees have yielded more (especially the smaller Carmel variety), are smaller, have incurred less shaker damage, have had fewer broken scaffolds, have had far fewer replants, have fewer mummies per acre, have reduced the need to hedge down the middle to improve drying at harvest and will probably have the longest productive life.

The long-term impacts require continued monitoring and documenting the effects of minimal pruning and high density planting. Time will tell how lack of pruning and close spacing will affect longer-term production and profits.

**Project Cooperators and Personnel:** Bruce Lampinen, University of California, Davis

### For More Details, Visit

- Poster location 55, Exhibit Hall A + B during the Almond Conference; or on the web (after January 2015) at [Almonds.com/ResearchDatabase](http://Almonds.com/ResearchDatabase)
- 2013-2014 Annual Reports CD (13-HORT5-Duncan); or on the web (after January 2015) at [Almonds.com/ResearchDatabase](http://Almonds.com/ResearchDatabase)
- Related project: 14-HORT6-Niederholzer