Nickels Soil Lab Projects

Project No.: **07-HORT6-Edstom**

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1. Pruning Systems for High Density Orchards

Objectives:

The objective of this trial is to evaluate tree training/pruning methods for maximum early production while maintaining long-term yields in tightly spaced (16' x 22') almonds.

Interpretive Summary:

Now after the 11th season of testing minimum pruning (i.e. "Unpruned" treatment) we are still optimistic about the viability of a minimum pruning system for almonds, particularly under conditions of moderate vigor. The primary concern involves the shading out of lower/middle fruitwood and potential yield reduction from the teen years onward. So far, Nonpareil and Monterey seem quite well suited to the system, while Aldrich and Carmel are questionable. Accumulative yields are equal between minimum and standard pruned trees for Nonpareil and Monterey while Carmel produced less on the "unpruned" trees. The "temporary limb" concept, as practiced here, is not worth the extra labor and is of questionable value. Mechanical topping appears to have value but was not adequately evaluated in this test.

Past results have shown that 1) minimally pruned trees and temporary scaffold trees out yield standard trees in the early years, 2) Temporary limb training is expensive and probably uneconomical, 3) Production between all treatments leveled out at the 6th year 4) Accumulated cost savings of $ 500-800 per acre to the 11th year are possible with minimum pruning methods, 5) Aldrich growth habit is incompatible with the temporary limb method 6) Some minimal amount of secondary and inside branch removal may be necessary under minimum pruning, 7) Nonpareil is most compatible with minimum pruning followed to Monterey, Aldrich and Carmel in decreasing order of compatibility, 8) No increase in disease or sticktights was found for minimum pruning, and 9) Tree height appears shorter with minimum pruning.

A common misunderstanding concerning the “Unpruned” treatment in this test needs clarification. The “unpruned” trees did receive some limb training. Three primary limbs were selected and all other competing limbs were removed the first dormant pruning. This method should actually be called minimum pruning.

The central questions concerning minimum pruning are; 1) the number of primary limbs to select, 2) the necessity of heading primaries, 3) the feasibility of retaining multiple scaffolds, 4) the shading of fruitwood and eventual yield decline, and 5) the range of varieties and growing conditions/vigor amenable to minimum pruning

Nonpareil Unpruned center

Nonpareil Standard center

PRUNING TEST YIELDS

lbs/acre

	Aldrich		**Carmel**		**Monterey**		**Nonpareil**	
	accum	***2007***	*accum*	***2007***	*accum*	***2007***	*accum*	***2007***
Standard	17,073	**2,963**	15,230	**2,370**	15,951	**2,764**	16,390	**3,276**
Temp Scaffold	**---**	**---**	15,567	**2,126**	16,217	**2,634**	16,747	**3,333**
Mech hedged	16,782	**2,991**	16,414	**2,560**	15,608	**2,516**	16,406	**3,086**
Minimum/ Unpruned	16,396	**2,734**	13,281	**2,066**	18,576	**2,719**	17,243	**3,273**

No statistical difference between treatments

2. Organic Almond Production Systems Evaluation

Objectives:

Evaluate the economics and productivity of different organic almond production methods suitable for the Sacramento valley region in keeping with USDA and CCOF requirements and in comparison to standard production methods.

Interpretive Summary:

In April of 2006 a new block of almonds was planted at the Marine Avenue location of the Nickels Estate in Arbuckle. The treatments are conventional, transitional and organic. The conventional trees are being grown using practices typical for conventional almond production in the area. The transitional trees will be grown conventionally for 2 to 3 years and then converted to organic. The organic trees are being grown using practices approved for organic production by the USDA and CCOF. The primary weed control method in the organic plots has been flaming using a tractor drawn propane flamer. In one row of each of the three organic plots, a six foot wide strip of woven plastic mulch in the tree row is being used for weed control. The conventional and transitional plots are strip sprayed with glyphosate to control weeds. In the conventional and transitional plots, nitrogen rates typical for conventional production are being applied through the drip system as UN 32. In the organic plots organic formulations of N have been applied through the drip system. During 2007 this included 1 oz. actual N in the form of Chilean Nitrate in the spring and 2 oz. of N as Agrolizer (6-2-0) in the summer. In the fall of 2006, 8 tons per acre of compost were applied to the organic and transitional plots and 6 tons per acre were applied in the fall of 2007. In the organic plots spinosad has been used to control Peach Twig Borer and Ecotrol has been used to control mites. All of the trees have been pruned and trained the same.

Through the second season tree observation and trunk circumference measurements have indicated no significant differences in rate of growth between any of the treatments. To this point weed control has been the most challenging. While flaming has been effective it is slow and expensive. During the second season the organic plots were flamed 14 times and required about 7 hours of application time per acre and 53 gallons of propane per planted acre. Additionally about 13 hours of hand labor per acre was required to control the weeds that got to big for flaming. The weed block fabric is performing well but was expensive and time consuming to install. The initial cost was 7 cents per square foot. Initially we had trouble with the fabric lifting off during wind storms which required reinstallation. This could be minimized by burying the edges of the fabric and using a solid 6 ft strip instead of two three foot strips or gluing the strips together instead of stapling them.

In the coming year we will be testing different organic weed control strategies and will be converting some of the block to buried drip to facilitate weed control.

We expect that as the trees come into production controlling bloom and leaf diseases will become a major emphasis and we will be testing different organically acceptable strategies.