University of California
Agriculture and Natural Resources
Making a Difference for California

Organic Almond Production System

Nickels Soil Lab Project

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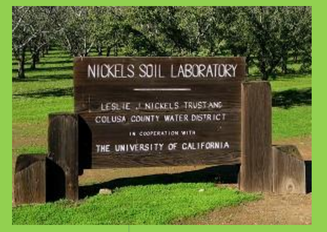


Objectives:

Evaluate the economics and productivity of USDA and CCOF compliant organic almond production methods suitable for the Sacramento Valley Region in comparison to standard production methods.

Nov 26, 2014

Conventional trees | Organic trees

Field Test Results - nine years experience

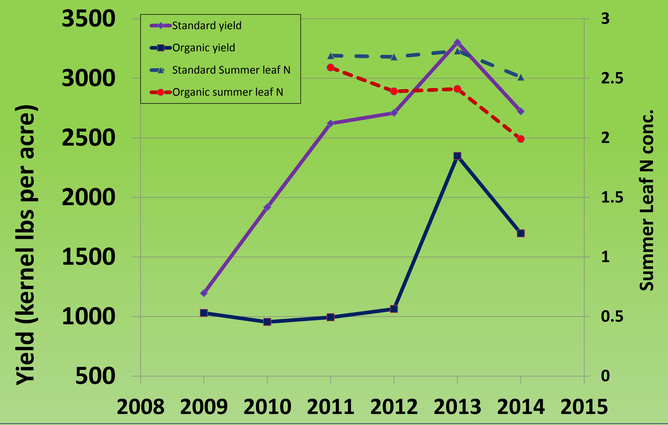
- Trees were planted in 2006 on Lovell rootstock. 75% Non-pariel, 25% Fritz. Every fourth tree in every row is a Fritz, the rest are Non-pareil. Transitional trees were farmed conventionally for three years and then shifted to organic production. Irrigation is through double-lined, buried drip tubing.
- Organic tree canopies are well developed but less dense than conventional(see photos @ lower left).
- Biggest challenges:
  - Nitrogen nutrition is very expensive (see last point below and costs in the table at right) and balancing need for increased production with the cost of org N to maintain that production is difficult.
  - Disease control – especially rust. Spring and summer sulfur sprays provided excellent rust control the past 3 seasons. Leaf rust is the biggest concern for spring/summer diseases. Note: There is a significant difference in disease risk at this location compared to other locations in Colusa Co.
  - Weed control - propane is expensive and multiple passes are required per season.
- Aggressive sulfur program (4x after petal fall) reduced leaf loss from rust. This program will be continued.
- Yields in all the treatments were off from 2013, when production in the organic block doubled compared to 2012, but still were less than two-thirds of those in conventional section (9th leaf).
- Production costs were $1148/acre higher (246%) for organic vs. conventional practices/materials in 2013. Seventy (70%) of the cost of producing almonds organically in this demonstration s in the cost of nitrogen (primarily) and some potassium (included in the 4-0-2 material) fertilizer). Efforts will be made in 2015 to improve nitrogen nutrition while lowering cost. Pelletized feather meal is a relatively cost effective organic fertilizer, but must be incorporated for best results.

Organic vs. conventional production: Yield and summer leaf nitrogen (N) levels, 2014

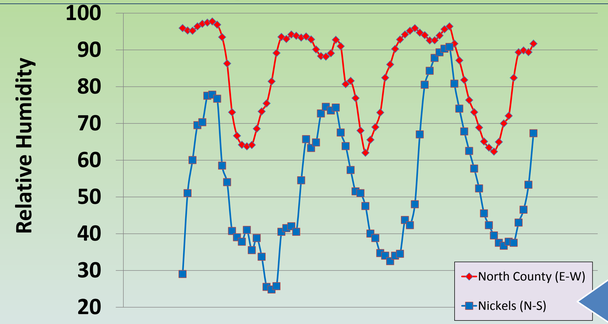
System	Yield lbs/Ac*	Kernels/oz	% leaf N
Standard	2,722	22	2.51
Transitional	1,788	22	2.03
Organic	1,608	23	1.95

*Yields in this report are calculated from small lots. They do not include deduction from huller/cracker loss and assume solid orchards with no missing trees. Therefore, the numbers are approximately 5-10% higher than expected in commercial block yields (after hulling).

Crop production (kernel lbs./acre) and summer leaf N levels over time in conventional vs organic treatments at Nickels site. Planted in 2006.



Differences in summer disease risk within the same region can influence organic production potential. Dew potential (RH>90%) is more frequent from day to day and lasts longer at the N. Colusa Co site vs Nickels location.



N-S; E-W indicates tree row direction. Prevailing winds are N-S

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