Mechanical Hedging to Manage Mature Almond Orchards

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PROJECT SUMMARY

Objectives:

This study is designed to assess the impacts of an unhedged control versus four different levels of hedging on midday canopy light interception and yield. Current year objectives are:

- Assess impacts of hedging on light interception/yield responses
- Investigate the role of hedging on nut quality as it varies by canopy position

Background and Discussion:

Density of California almond planting has been increasing in a linear fashion from about 80 trees per acre in the early 1980s to 112 trees per acre in 2012. 112 trees per acre corresponds to a spacing of approximately 15 x 21 feet. Although orchards at these close spacings tend to come into production earlier, there are often problems with lower canopy shading and difficulty with getting adequate sunlight to the orchard floor to dry the nuts at harvest as they mature. This suggests that there is a tradeoff between maximum production and food safety risk in almond. Recent recommendations from the author suggest that orchard photosynthetically active radiation interception at maturity should not be above 80%. This should still result in a yield potential of about 4000 kernel pounds per acre. This is substantially higher than the statewide average per acre yield of about 2400 kernel pounds per acre in 2012. This suggests that crowding related issues will continue to increase with increasing tree density.

The current study is designed to assess the impacts of three different levels of hedging (28", 38" and 48" vertical cuts) compared to an unhedged control on midday canopy light interception, yield and nut size in a 13 year old orchard with 50% Monterey, 25% Nonpareil, and 25% Wood Colony (21' x 24' spacing). Yield data was collected on Nonpareil and Monterey in 2014 and will be reported in the annual report in 2015.

Preliminary light interception data collected in 2013 before treatments were imposed showed light interception levels were just below 80% and that there were no significant differences across the orchard. Hedging treatments were imposed in December 2013. Impacts of the hedging treatments on yield and midday canopy light interception, midday stem water potential (approximately every 3 weeks) and yield/quality data were collected in 2014. Light interception was decreased in the expected order with the largest decrease in the widest hedging treatment and the smallest decrease in the narrowest hedging treatment. Decreases in light interception related to hedging were less than predicted, likely due to the weight of the crop pulling branches down into the middle of the drive row. Variation in nut size was assessed by hand cracking a 200 nut sample from each replication, rating the nuts for quality, and weighing each individual nut to get the distribution of nut weights. There was a trend towards more small nuts in the hedged treatments likely because the hedging cut exposes spurs in positions that had low light, and hence low carbohydrate reserves, in the previous year. There were no significant treatment impacts on midday stem water potential.

Project Cooperators and Personnel: Sam Metcalf, Bill Stewart and Ignacio Porris Gomez, University of California, Davis; Paramount Farming Co.

For More Details, Visit

- Poster location 65, Exhibit A + B during the Almond Conference; or on the web (after January 2015) at Almonds.com/ResearchDatabase
- 2013-2014 Annual Reports CD (13-HORT19-Lampinen); or on the web (after January 2015) at Almonds.com/ResearchDatabase
- Related project: 14-HORT13-Lampinen