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 midday stem water potential, orchard floor temperatures and nut quality

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 correspond 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).

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.

There were no significant treatment related impacts on water relations, overall yield, nut quality or yield per unit light intercepted in 2014. Although there was a trend towards lower yield with more severe hedging cuts in Nonpareil, in Monterey the widest hedging cut resulted in significantly higher yield, likely due to more light hitting the smaller stature Monterey trees in mid-morning and mid-afternoon. However, hedging did lead to increased center of row orchard floor temperatures which should result in decreased food safety risk and improved ability to dry nuts on the orchard floor. Based on the results of this study, it does not appear that hedging cuts of 28" to 48" were detrimental to yields under the conditions of this study and may be beneficial in reducing food safety risk and improving ability to dry nuts on the orchard floor at the time of harvest.

Project Cooperators and Personnel: Sam Metcalf, Bill Stewart and Ignacio Porris Gomez, University of California, Davis; and The Wonderful Company

For More Details, Visit

- Poster location 58, Exhibit A + B during the Almond Conference; or on the web (after January 2016) at Almonds.com/ResearchDatabase
- 2014 - 2015 Annual Reports CD (14-HORT19-Lampinen); or on the web (after January 2016) at Almonds.com/ResearchDatabase
- Related project: 15-HORT13-Lampinen