Development and Testing of a Mobile Platform for Measuring Canopy Light Interception

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PROJECT SUMMARY

Objectives:
- Utilize the mobile platform light bar to complete collection of light interception and yield data for long term studied orchards with the goal of determining what happens to this relationship as orchards age.
- Complete and release a working version of the iPhone application on a trial basis (to farm advisors and select growers) to calculate canopy light interception.

Background and Discussion:

Data collected on tree canopy light interception has shown that it is a valuable indicator of an almond orchard's potential productivity. Results suggest that 50 kernel pounds of almond can be produced for each 1% of total incoming midday canopy photosynthetically active radiation (PAR) that is intercepted. These data are also valuable in evaluating new cultivars to assess whether higher yields can be attributed to higher efficiency or whether they simply grow faster.

Traditionally, obtaining the PAR data has been a slow and labor-intensive process based on use of a hand-held lightbar. Consequently, data gathering has often consisted of only limited and small-scale sampling and of collecting PAR data from only a portion of the row where yield data was collected.

Starting about 6 years ago, a mobile platform lightbar was developed on a Kawasaki Mule. It can span an entire row (up to 32 feet), and includes an advanced data logger and accurate GPS. With this setup, it is possible to gather data at a high rate of speed.

In 2016, research concentrated on collecting light interception data on the orchards that had the longest term data sets with the goal of understanding what factors lead to yield declines as orchards age. A number of orchards that maintained relatively high productivity per unit light intercepted have been identified. The data from the 2016 harvest season were still being compiled at the time of reporting.

A working version of the iPhone app for estimated midday canopy PAR interception has been completed and was released to farm advisors and select growers during the summer of 2015 and further tested and refined in 2016. This app gives growers a tool to estimate yield potential and estimated nitrogen needs of a given orchards based on canopy size. The app is now available in the Apple Store under the name iPAR.

Overall, this project has the potential to significantly improve orchard design and management by providing a basis for better managing water, as well as estimating productivity and crop nitrogen needs.

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For More Details, Visit
- Poster location 42, Exhibit A + B during the Almond Conference; or on the web (after January 2017) at Almonds.com/ResearchDatabase
- 2015 - 2016 Annual Report CD (15-HORT13-Lampinen); or on the web (after January 2017) at Almonds.com/ResearchDatabase
- Related projects: 16-HORT2-Lampinen; 16-PATH1-Browne (COC); 16-HORT17-Shackel/Sanden/Fulton/Doll (COC); 16-HORT5-Duncan