

Forecasting the Annual Almond Crop Production in California

Project Leader: Jane-Ling Wang

Department of Statistics, University of California, Davis, One Shields Ave., Davis, CA 95616
(530) 752-2361, janelwang@ucdavis.edu

PROJECT SUMMARY

Objectives:

The primary focus of this project is to answer the following questions:

- What are the statistical operating characteristics of the existing methods for forecasting California almond production?
- What are the changes that can be made to the existing methods for forecasting California almond production that could improve their accuracy and precision?
- Can the Nonpareil production be forecast with better accuracy and precision?

Background and Discussion:

California is the largest almond producer in the world and the almond crop is a vital part of California's economy. It is thus crucial to have accurate predictions of the annual total crop for effective marketing and distribution of the crop.

The National Agricultural Statistics Service of the USDA (NASS-USDA) has developed and uses a plan to forecast the annual crop production together with its associated prediction interval. Previous predictions have been satisfactory but the Almond Board of California would like to improve the precision of the forecast intervals and develop an improved plan to predict Nonpareil production.

The research in the past year focused on the second and to some extent the third objective. Crop estimates are based on three components:

an estimate of the number of nuts per tree, an estimate of the number of trees per acre, and an estimate of the number of acres planted in a given variety.

The "nuts per tree" estimate is based on first selecting a representative (random) sample of orchards and trees within the selected orchards, and then estimating the number of nuts on those trees by counting the nuts on a "random path" through the tree, extrapolating that count to an estimate of the nuts on the entire tree. This extrapolation relies on the assumption that the number of nuts on a branch is proportional to the cross sectional area of the branch. This assumption appears to be valid for the smaller branches, but the extrapolation formula may benefit from an adjustment when branch cross sectional areas are large. This form of this adjustment may vary by almond variety, which could improve the crop estimate particularly for the Nonpareil crop.

The estimation of the number of acres in a given variety is more problematical, since acreage enters or leaves production every year and records of those changes become available only after the harvest has occurred.

By comparison, the estimation of the number of trees per acre is more straightforward, since those numbers in large follow standardized patterns within a given variety and location.

Project Personnel and Cooperators: Neil Willits, Department of Statistics, UC Davis; Vic Tolomeo, USDA-NASS

For More Details, Visit

- Poster location 73, Exhibit Hall A and B during the conference; or on the web (after January 2014) at www.almondboard.com/researchreports
- 2012.2013 Annual Report CD (12-ABCBOD1-Wang); or on the web (after January 2014) at www.almondboard.com/researchreports