Almond Variety Development

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PROJECT SUMMARY

Objectives:

Develop improved pollenizers for Nonpareil, including varieties that possess self-fruitfulness and improved market value and resistance to disease, insects and environmental stresses resulting from changing climates and water quantity/quality.

- Generate 12,000 new seedling progeny with subsequent field plantings of ~6,000 new trees. Evaluate and reduce by an additional 5% the ~12,000 progeny trees currently in breeding trials.
- Identify effective predictors of yield potential (annual and cumulative) to assess opportunities/limitations of traditional as well as evolving biotech approaches including molecular marker-assisted-selection (MAS).
- Assess opportunities and limitations of advance breeding germplasm currently being tested in Regional Variety Trials. Expand smaller regional grower trials to evaluate next generation selections.

Background and Discussion:

Commercial almond production in California is dependent almost entirely on the variety Nonpareil and a relatively few closely-related pollinizers, most of which have Nonpareil and Mission as direct parents. A long-term emphasis of this breeding program has been the identification and incorporation of new and more diverse germplasm. Genetic solutions to emerging production challenges are now becoming available from this improved germplasm, including regionally-adapted selections expressing high productivity, self-fruitfulness, and increased insect, disease and environmental stress resistance. Expanded market demand may also result by optimizing phytonutrients in new cultivars, such as the high 'heart-friendly' oleic acid content in the recently released Sweetheart variety, while minimizing potential health and marketing risks including aflatoxins, allergens and salmonella.

Breeding crosses in 2017 have generated over 14,000 hybrid seed despite the very challenging weather at bloom. Approximately 6,000 seed have now been planted to the field or greenhouse. Ten UCD selections have been advanced to the Regional Variety Trials following extensive initial grower testing with 6 of these demonstrating high levels of self-fruitfulness. An additional 20 UCD self-fruitful selections have been planted in new grower trials in the San Joaquin Valley.

The UCD almond breeding program has recently released the new variety *Kester*, following long-term and multi-site grower testing as 2-19E. Consistent with its previous regional performances, the variety *Kester* continues to show high yields and kernel quality comparable to Nonpareil. In addition, *Kester* is fully cross-compatible with Nonpareil as well as all other commercial pollinizers and blooms after Nonpareil and so is less vulnerable to damage by early spring frosts. Kernels are similar to Nonpareil but with well-sealed shells and a harvest time of 4 to 7 days after Nonpareil.

Project Cooperators and Personnel: J. Fresnedo, B. Lampinen, J. Adaskaveg, D. Lightle, J. Connell, S. Metcalf, F. Niederholzer, R. Duncan and D. Doll.

For More Details, Visit

- Poster location 92, Exhibit Hall A + B during the Almond Conference; or on the web (after January 2018) at Almonds.com/ResearchDatabase
- 2016 - 2017 Annual Reports (16-HORT1-Gradziel) on the web at Almonds.com/ResearchDatabase
- Related project: 17-HORT2-Lampinen