

Almond Variety Development

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PROJECT SUMMARY

Objectives:

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

- Generate 14,000 new seedling progeny with subsequent field plantings of ~8,000 new trees. Evaluate and reduce by an additional 15% the ~18,000 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 advanced breeding germplasm currently being tested in Regional Variety Trials (RVTs). 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 pollenizers, 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 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 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.

Following long-term RVT and grower testing, the Kester variety has been released (tested as selection 2-19e). Kester produces high yields, is fully cross-compatible with Nonpareil as well as all other commercial pollenizers and blooms approx. 4 days after Nonpareil and so is less vulnerable to damage by early spring frosts. Kernels are similar to Nonpareil but with well-sealed shells. Harvest is 4 to 7 days after Nonpareil.

Breeding crosses in 2016 have resulted in over 16,000 breeding seed, with approximately 10,000 seed targeted for field planting after initial greenhouse culling. Molecular marker methods are being utilized to improve our understanding of individual gene inheritance. Ten UCD selections have been advanced to the Regional Variety Trials following extensive initial grower testing and 6 of these are self compatible. An additional 22 UCD selections are currently being propagated for new grower testing in the different almond production areas.

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

For More Details, Visit

- Poster location 44, Exhibit Hall A + B during the Almond Conference; or on the web (after January 2017) at Almonds.com/ResearchDatabase
- 2015 - 2016 Annual Reports CD (15-HORT1-Gradziel); or on the web (after January 2017) at Almonds.com/ResearchDatabase
- Related projects: 16-HORT2-Lampinen