

# 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 16,000 new seedling progeny with subsequent field plantings of ~10,000 new trees. Evaluate and reduce by an additional 20% the ~22,000 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 (RVTs). Expand smaller regional grower new trials to evaluate next generation selections.

#### Background and Discussion:

The California almond industry is in a historic period of transformation driven by increased Central Valley acreage along with increasing environmental and market requirements, reductions in resources such as water, agrochemicals, and natural pollinators, as well as the uncertainties of a changing climate. While almond represents a diverse and highly adaptable species, commercial 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 the UC Davis (UCD) almond breeding program has been the identification and incorporation of a 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. Improved breeding lines also offer opportunities to expand market demand by optimizing phytonutrients in new cultivars, such as the high heart-friendly oleic acid content in the recently released Sweetheart variety. The new Regional Variety Trials (RVT) includes a large number of genetically diverse UCD selections. The diversity has been introduced to capture of the greatest genetic contributions to kernel yield, quality and resistance.

Following long-term RVT and grower testing in all major California production regions, the UCD breeding program has released the Kester almond variety as a late-bloom pollenizer for Nonpareil which is less vulnerable to spring frosts. Kernels are similar to Nonpareil but with well-sealed, worm resistant shells. Harvest is 4 to 7 days after Nonpareil. Trees are upright to spreading and moderately vigorous, being about 80% of Nonpareil size at maturity.

**Project Cooperators and Personnel:** J. Fresnedo, B. Lampinen, J. Adaskaveg, J. Connell, S. Metcalf, F. Niederholzer, M. Gilbert, T. DeJong, P. Brown, R. Duncan, D. Doll, G. Brar and S. Overstreet

#### For More Details, Visit

- Poster location 50, Exhibit Hall A + B during the Almond Conference; or on the web (after January 2016) at [Almonds.com/ResearchDatabase](http://Almonds.com/ResearchDatabase)
- 2014 - 2015 Annual Reports CD (14-HORT1-Gradziel); or on the web (after January 2016) at [Almonds.com/ResearchDatabase](http://Almonds.com/ResearchDatabase)
- Related projects: 15-HORT2-Lampinen; 15-HORT21-Gilbert; 14-HORT7-Gradziel