

16TH ANNUAL ALMOND RESEARCH CONFERENCE, DECEMBER 6, 1988, SACRAMENTO

Project No. 88-M1-Almond Variety Improvement

Project Leaders: Dr. Thomas M. Gradziel (916) 752-1575 or 752-0122
Dr. Dale E. Kester (916) 752-0914 or 752-0122
Dr. Steve Weinbaum (916) 752-0255 or 752-0122
Department of Pomology
University of California
Davis, CA 95616

Personnel: Karen Pelletreau, W. Beres and T. Muraoka

Objectives: The long range goals of this research program are to develop pollenizers for current varieties, particularly Nonpareil, and develop replacement varieties for Nonpareil (and other market types) that are self fertile with a range of bloom time and maturity.

Current objectives are: (1) Complete the analysis and summarization of the data and information obtained in the described material to date. (2) Confirm self-fertility characteristics and clarify the relationship between self-compatibility and self-pollination. (3) Make additional crosses that will provide future generations of seedling material that will incorporate low BF-potential, self-fruitfulness, good yield potential, and desirable nut and tree characteristics.

Interpretive Summary:

Information from this project was formerly included either in the BF project or in the Variety evaluation project. This year it was separated from the other two to concentrate on the genetic improvement in almond cultivars with emphasis on the genetic basis of the pollination system (emphasis on self-fertility), yield components, and other characteristics essential towards a program of almond variety improvement.

1. Sources of self-fertility in UCD germplasm.

Almond varieties, with a couple of recent exceptions, are self-incompatible. Germplasm and potential varieties that have been self-fertile to various degrees have been identified in germplasm materials and new selections in the collection at UCD. These now include at least one imported variety (Trusito) from Italy and a number of new seedling offspring from a similar if not identical variety (Trojoto). Most materials however are products of interspecific hybrids of almond with other species. These include peach and Prunus mira. One group of these previously selected as potential commercial varieties but their level of self-fertility is unclear. A second group from recently grown F2 populations of Nonpareil and several low-BF-potential varieties, including both dwarfed and non-dwarfed types appear to be highly self-fertile.

During the past two seasons a third group, arising from crosses from almond and other almond species, primarily *Prunus webbii*, have been found to be self-fertile to various degrees.

Trees of the latter group have been propagated into selection blocks at the UC orchards at WEO, Winters, for evaluation for commercial use.

2. Inheritance of self-fertility alleles.

Previous work has identified three of the four incompatibility groups expected from the parentage of Nonpareil x Mission. Previous tests have indicated this combination is the pedigree of most of our commercial varieties. The three groups are (a). Ne Plus Ultra, Merced, Price group), (b). Thompson, Harvey group and (c). Carmel group. A likely fourth group has been found in seedlings of a Nonpareil x Ne Plus seedling population but this years tests were insufficiently conclusive.

Current objectives are: (1) Complete the analysis and summarization of the data and information obtained in the described material to date. (2) Confirm self-fertility characteristics and clarify the relationship between self-compatibility and self-pollination. (3) Make additional crosses that will provide future generations of seedling material that will incorporate low B₂-potential, self-fertility, good yield potential, and desirable nut and tree characteristics.

Interpretive Summary:

Information from this project was formerly included either in the B₂ project or in the Variety evaluation project. This year it was separated from the other two to concentrate on the genetic improvement in almond cultivars with emphasis on the genetic basis of the pollination system (emphasis on self-fertility), yield components, and other characteristics essential towards a program of almond variety improvement.

1. Sources of self-fertility in UCD germplasm.

Almond varieties, with a couple of recent exceptions, are self-incompatible. Germplasm and potential varieties that have been self-fertile to various degrees have been identified in germplasm materials and new selections in the collection at UCD. These now include at least one imported variety (Truico) from Italy and a number of new seedling offspring from a similar if not identical variety (Troloco). Most materials however are products of interspecific hybrids of almond with other species. These include peach and *Prunus* mix. One group of these previously selected as potential commercial varieties but their level of self-fertility is unclear. A second group from recently grown B₂ populations of Nonpareil and several low-B₂-potential varieties, including both dwarfed and non-dwarfed types appear to be highly self-fertile.