Develop Molecular Markers for Identifying Almond Self-Incompatibility and Self-Compatibility

Project Leader: Jerry Dangl
Foundation Plant Services, University of California, Davis, One Shields Ave., Davis, CA 95616
(530) 752-7540, gsdangll@ucdavis.edu

PROJECT SUMMARY

Objectives:

In support of ongoing research efforts to develop new almond varieties,

- Develop molecular markers based on polymerase chain reactions (PCRs) as a tool for accurately and rapidly distinguishing among the self-incompatibility and self-compatibility genotypes used in the almond-breeding program of the University of California, Davis (UCD).
- Test utility of the markers to identify/characterize the self-compatibility genotypes in advanced UCD almond-breeding lines. Use markers in determining final expression of self-compatibility for different self-compatibility genes and combinations.
- Make self-incompatibility S-allele genotyping available to the California almond industry.

Background:

As research goes forward in myriad ways to develop new and better almond varieties, parallel efforts are being made to develop the advanced analytical tools needed to support the UCD breeding program.

One promising area of research activity is focused on exploring the use of molecular markers. This current project, for example, builds on the efforts made by the project researchers and others to devise simple sequence repeat (SSR) markers capable of distinguishing among even closely related almond varieties.

Their approach is to undertake high throughput PCR-based analysis of the self-incompatibility (S-allele) gene in almond. Given that S-allele identification involves direct analysis of molecular variability within the gene itself, this approach leads to the accurate identification of unknown trees and cultivars—and also of their cross-incompatibility group.

Further, because self-compatibility (self-fruitfulness) seems to result from an S-gene mutation, the project team should be able to identify the various self-compatibility genetic sources used in the UCD breeding program.

Having that capability assists breeding by making it possible to identify the most effective individual and in-combination sources of almond self-compatibility, as well as to quickly and accurately select highly self-compatible types as early as the seedling stage of development.

Project Cooperators and Personnel: Tom Gradziel, Carlos Crisosto and Abhaya Dandekar, Plant Sciences, University of California, Davis, Judy Yang, Foundation Plant Services, University of California, Davis

For More Details, Visit

- Poster location 10, Exhibit Hall, Session 3; or on the web (after January 2011) at AlmondBoard.com/AICposters
- 2009-10 Annual Report CD (09-HORT14-Dangl/Gradziel); or on the web (after January 2011) at AlmondBoard.com/ResearchReports