

Almond Brown Line Disease: Development of a Molecular Assay for Its Detection

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PROJECT SUMMARY

Objectives:

The goal of this project is to isolate DNA from symptomatic trees to develop a DNA-based method for the detection of the pathogen, which will be a tool for certification of plant material and reduce disease incidence. Steps to accomplish this include:

- Molecular characterization of the phytoplasma associated with almond brown line disease.
- Develop specific primers for quantitative real time PCR and monitor the titer of PYLR phytoplasma in peach and almond trees maintained at UCD orchard.
- Obtain diseased leaf samples from symptomatic trees in the spring, summer, and fall to assess the best time to sample the trees for the detection of phytoplasma.

Background and Discussion:

Almond brown line disease causes death of affected young trees within a year or two. Diseased trees showed bark split, union disorder and a brown line consisting of necrotic phloem tissue.

Molecular analysis done on nucleic acid extracts using polymerase chain reaction (PCR) has indicated that the association of a phytoplasma closely related to peach yellow leaf roll phytoplasma (PYLR). There are no chemical control options to manage diseases caused by phytoplasmas.

Diseased almond trees have been observed primarily when rooted on Mariana 2624, a plum rootstock. Marianna is useful for marginal soils and has some resistance against a number of soil-borne pests.

Given that the phytoplasmas can be transmitted via infected rootstocks, it would be useful to have a method for assessing the source of wood which wood is infected. A sensitive detection method would permit the certification of plant material as phytoplasma-free, thus reducing transmission.

The goal of this project is to analyze DNA from symptomatic trees to develop a DNA-based method for disease detection. The CDFA Nursery Improvement Advisory Board (IAB) is co-funding this effort, as a detection method could be a tool used in clean plant certification programs.

Project Cooperators and Personnel: Franz Niederholzer, UCCE Yuba / Sutter & Colusa Counties; Jerry Uyemoto, USDA/ARS (emeritus), Davis

For More Details, Visit

- Poster location 9, Exhibit Hall, Session 1, or on the web (after January 2012) at AlmondBoard.com/AICposters
- 2010 - 2011 Annual Report CD (10-PATH9-Sudarshana); or on the web (after January 2012) at AlmondBoard.com/ResearchReports