

Development and Optimization of the Steam Auger for Managing Almond Replant Disease in the Absence of Soil Fumigation

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PROJECT SUMMARY

Objectives:

- Monitor the early growth and vigor of almond trees in 3 test plots following the application of spot treatment using steam as a means of controlling replant disease (RD).
- Scale up the auger-based steam soil treatment process as a basis for assessing the technical feasibility and economic viability of applying steam effectively to larger areas.
- Undertake additional field trials to optimize the design and application techniques of an auger-based steam-injection methodology.

Background:

This project represents a further step in the search for nonchemical means of combating RD in replanted orchards. RD is a soil-borne and host-specific microbial complex that suppresses root and shoot development, especially in the first year after replanting, and thereby, if uncontrolled, can limit tree growth and nut yield over time.

It is a widespread problem in California, with any acreage to be replanted Prunus to Prunus at risk. Additionally, nematode parasitism, which is also associated with replanting, affects about a third of the almond acreage and can further limit nut yield.

Traditionally, these and other replant-related pest problems have been managed through the pre-plant application of methyl bromide and other soil fumigants. In recent years, however, rising environmental and human-health concerns have led to the implementation of restrictive regulations on the use of soil fumigants.

Consequently, researchers have been exploring alternative means of controlling RD. In 2009, members of the current project, and others, replanted an almond orchard using an auger-based steam treatment and are monitoring the efficacy and cost of the soil treatment.

It is recognized that injecting steam by means of an auger is not likely to have application on a scale comparable to that of applying soil fumigants, or for situations where deeper soil treatment is needed. Nevertheless, the researchers believe that the steam auger method may have the potential to provide growers with an effective tool where the use of soil fumigants is not allowed. The researchers continue to seek ways to make the system more efficient both in terms of transmitting the heat to the soil as well for speed of operation.

Project Cooperators: Andrew Johnson, University of California, Davis; Alfonso Cabrera, University of California, Riverside; Bob Weimer, Merced

For More Details, Visit

- Poster location 1, Exhibit Hall, Session 1, or on the web (after January 2012) at AlmondBoard.com/AICposters
- 2010 - 2011 Annual Report CD (10-AIR6-Hansen/Fennimore); or on the web (after January 2012) at AlmondBoard.com/ResearchReports
- Related Projects: 11-PATH1-Browne