Almond Fumigant Studies: Continued Research on Methyl Bromide Alternatives and Fumigant Alternatives for Buffer Zones

Project Leader: David Doll
University of California Cooperative Extension – Merced County, 2145 Wardrobe Ave., Merced, CA 95341
(209) 385-7403, dadoll@ucdavis.edu

PROJECT SUMMARY

Objectives:

- To assess established fumigant plots for control of Prunus Replant Disease and plant pathogenic nematodes.
- Develop non-fumigant based control measures for almond replant disease and plant pathogenic nematodes within fumigant buffer zones.

Background and Discussion:

Pre-plant soil fumigation has been shown to increase almond yields in replant situations regardless of nematode populations. Increasing regulations, however, have restricted the use of some fumigants due to offsite movement and volatile organic compounds. This has led to a decrease in the amount of fumigant that can be applied per township as well as reduced the ability to apply fumigants within varying distances of sensitive areas.

This project provides support to continue plot monitoring and nematode sampling for various almond replant fumigant trials planted in coarse soils with the presence of plant parasitic nematodes. Sites have varying treatments testing alternatives to methyl bromide, reduced area fumigation, and alternatives to 1,3-dichloropropene and chloropicrin. The four fumigated trials supported include:

- South Livingston Trial. Planted in the spring of 2010 and located on a loamy sand soil near Livingston, CA. This trial is comparing conventional fumigants to methyl bromide.
- Ballico Trial. Planted in the spring of 2011 and located on a sand soil near Ballico, CA. This trial is comparing conventional fumigants with non-fumigant alternatives.
- Winton Trial. Planted in the spring of 2012 and located on a loamy sand soil near Winton, CA. This trial is comparing conventional fumigants with non-fumigant alternatives.
- Ballico Trial #2. Planted in the spring of 2015 and located on a sand soil near Ballico, CA. This trial is comparing an alternative fumigant and non-fumigant alternatives to conventional fumigation.

Treatments within the trials are being monitored for tree growth, yield, and nematode populations. Harvest data is collected upon first harvest - usually the third year, and continued through the fifth year, possibly longer. Diameter and circumference measurements are made in the dormant period following the year of growth. Nematodes are sampled from established plots following the growth in mid-October.

Initial results from harvest data indicate that fumigants containing Telone-II, mixtures of Telone-II and chloropicrin are out-yielding the non-fumigated control. Nematode re-infestation has occurred more rapidly than previously thought, with almond parasitic nematodes being detected within two years' post-fumigation, regardless of fumigant treatment. Spot fumigation has been found to be as effective as rowstrip treatments in replant situations with the presence of nematodes.

Project Cooperators and Personnel: Andrew Ray, and Vivian Lopez, UCCE -Merced; Amanda Hodson, UC Davis, Davis, CA; Brad Hanson, UCCE - Weed Specialist, Davis, CA; Greg Browne, USDA-ARS, Davis, CA.

For More Details, Visit

- Poster location 83, Exhibit Hall A + B during the Almond Conference; or on the web (after January 2017) at Almonds.com/ResearchDatabase
- 2015 - 2016 Annual Reports CD (15-AIR9-Doll); or on the web (after January 2017) at Almonds.com/ResearchDatabase
- Related projects: 16-AIR5/5A-Gao/Doll; 16-PATH1-Browne; 16-PATH7-Duncan/Baumgartner