

Using TIF Tarp and Reduced Fumigation Rates for Almond Replanting

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PROJECT SUMMARY

Objectives:

- Demonstrate that the use of totally impermeable film (TIF) tarp can improve fumigant distribution in soil and control pests while reducing emissions in orchard replanting field fumigation.
- Evaluate pest control efficacy, especially nematodes under TIF tarp and reduced fumigation rates.
- Monitor almond tree vigor and growth from different fumigation treatments in fumigated growers' fields.
- Determine the effective field fumigation rates under TIF tarp with regards to soil-borne pest control and almond tree performance.

Background and Discussion:

This research continues to investigate effective soil fumigation methods for soil-born pest control with a lower environmental impact. Field trials have shown that low permeability tarps, such as totally impermeable film (TIF), can significantly reduce emissions and be used with lower fumigant rates. However, current fumigation methods at even 100% full rate cannot provide 100% kill for plant parasitic nematodes in soil below 3 ft (~1 m) depth due to insufficient movement of fumigant in soil profile. During 2015-2016, our main research activities were field monitoring two almond orchards (Merced trial and Ballico trial) that were fumigated and replanted in previous years. The Merced trial (fumigated in November 2012) tested different fumigant rates

with different surface sealing methods on fumigant movement and tree growth. Two years of yield data (2015 and 2016) were collected. Nematode recovery three years after fumigation was also determined. Although all fumigation treatments provided significant improvement on tree establishment and early growth, yield data showed that there are no significant differences in almond yield between the 100% and the 66% rates of Telone® C35 regardless of surface sealing methods during fumigation. The nut yield at 33% rate plots was not significantly different from the unfumigated control. However, nematode populations, which are dominated by pin and ring nematodes, three years after fumigation appeared to return to pre-fumigation levels in all fumigated treatments.

The Ballico trial (fumigated in December 2014) tested different rates and two injection depths (18 vs. 28 in). The deeper injection improved nematode control, resulting in no survival in this sandy soil. Tree growth has been and continues to be monitored until yield measurement can be made in 2017.

A new fumigation trial to further test the benefits of deep fumigant injection and using biochar (lower costs and more benefits on soil quality than the TIF, the most effective material to reduce emissions) to control emissions has been scheduled to be conducted in early November this year in Hughson on Hick's Farm.

Project Cooperators and Personnel: David Doll, UCCE – Merced County; Greg Browne, USDA-ARS, Davis; James Gerik, Dong Wong, USDA-ARS, Parlier; Brad Hanson, UCCE - Davis; Ruijun Qin, Sadikshya Dangi, UC Davis.

For More Details, Visit

- Poster location 81 and 82, 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-AIR5-Gao and 15-AIR5A-Gao/Doll (Doll Portion)); or on the web (after January 2017) at Almonds.com/ResearchDatabase
- Related projects: 16-AIR5A-Gao/Doll (Doll Portion); 16-AIR9-Doll; 16-PATH1-Browne; 16-PATH7-Duncan/Baumgartner (COC)