Using TIF Tarp and Reduced Soil Fumigation Rates for Almond Replanting

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PROJECT SUMMARY

Objectives:

- Demonstrate that the use of TIF tarp can improve fumigant distribution in soil and increase fumigant concentration-time exposure indices for better pest control than standard PE tarp.
- Evaluate pest control efficacy (e.g., nematodes) under TIF tarp and reduced fumigation rates.
- Monitor almond tree vigor and growth from different fumigation treatments in growers' fields.
- Determine the effective field fumigation rates under TIF tarp with regards to soil-borne pest control and almond tree performance.

Background:

Almond replanting still relies largely on pre-plant soil fumigation to control soil-borne pests and diseases in order to establish productive and healthy trees. Soil fumigations face tremendous regulatory pressure so that research on fumigation methods for high pest control efficiency and low environmental impact are greatly needed in order to increase sustainable production of almonds. Using low permeability tarps such as totally impermeable film (TIF) has shown potential to achieve this situation, as well as provide the possibility of using reduced rates because of its ability to retain fumigants under the tarp, increase fumigant residence time in soil, and reduce emissions.

In the last two years, our research has found that using TIF can significantly control emission loss, increase fumigant residence time in soil, and improve fumigant distribution for better efficacy in soil fumigation not only for annual crops but also potentially in perennial fumigated fields (See 10.AIR5.Gao annual report).

In fall 2011, the use of lower rates of fumigant under TIF tarp was tested in an orchard replant looking at fumigant emission, fate, and distribution in soil as well as efficacy. TIF reduced emissions more than 95% relative to bare soil, while standard PE tarp reduced emissions ~30%. TIF significantly increased fumigant concentration or concentration-time exposure indices at 15 cm depth relative to the PE film. A 2/3 of normal fumigation rate under TIF provided the same level of nematode control as the full rate at different depths. More field tests are needed to assess if this finding is consistent under various fumigation conditions.

Current work continues to assess whether the better uniformity and higher concentration of fumigant in the soil can be achieved under TIF in different soils, and that reduced fumigant rates under TIF maintain good pest control and satisfactory tree response in almond replanting orchard. The effort will provide information on effective use of soil fumigants while minimizing environmental impact from soil fumigation under perennial replanting situations.

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For More Details, Visit

- Poster location 14, Exhibit Hall A & B during conference; or on the web (after January 2013) at www.almondboard.com/researchreports
- 2011.2012 Annual Report CD (11.AIR5.Gao); or on the web (after January 2013) at www.almondboard.com/researchreports
- Related Projects: 12.AIR9.Doll