

Minimize Emissions and Improve Efficacy of Soil Fumigations Using TIF Tarps

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PROJECT SUMMARY

Objectives:

- Demonstrate the potential of totally impermeable film (TIF) to improve soil fumigant distribution in soils.
- Determine the potential of using reduced fumigant application rates in achieving good efficacy under the TIF tarp.
- Determine fumigant persistence under and adjacent to the TIF tarp over time and evaluate the waiting period between application and tarp-cutting to minimize potential exposure risks to workers and bystanders.

Background:

Soil fumigants continue to play a critical role for soil pest management in almonds. However, due to concerns about risks to bystanders and to reduce VOC air emissions, the use of soil fumigants is being ever more limited by both EPA and CDPR. The primary concern is with the emissions, both peak and cumulative loss from the soil into the air.

Various techniques to reduce emissions have been tested including water seals, various tarps, ammonium thiosulfate, organic matter, etc. (See 09-Air5-Gao annual report). Water seals are somewhat effective but not always practical to apply. Ammonium thiosulfate helps breakdown some soil fumigants but there are additional concerns in using this chemical. Organic matter did not reduce emissions at high fumigation rates. Standard HDPE tarps do not effectively reduce

emissions either.

Recently developed totally impermeable films (TIF) have shown the ability to significantly reduce emissions by effectively holding the fumigants under the tarp and in soil. This would potentially increase the concentration, extend the residence time, and improve distribution of fumigants in soil in comparison with traditionally used standard tarp. The use of TIF tarps could improve efficacy, and may allow the rates of soil fumigants to be reduced.

The primary focus of the project is to assess whether the above hypotheses hold in the field.

One field trial was conducted for five weeks in fall 2010 with TIF and different application rates of Telone C35. For details of the results, see 10-AIR5-Gao annual report. The data indicated that the TIF tarp retained significantly higher concentrations just under the tarp, and also gave higher fumigant concentrations in the soil profile than the standard tarp at the same application rate. Longer tarping periods will be needed to avoid a spike in emissions when cutting tarp.

Current work is focused on assessing whether the better uniformity and higher concentration of fumigant in the soil under TIF, allow the use of lower fumigant rates while maintaining or improving efficacy of control. The effort will continue to quantify emission reductions with TIF from pre-plant soil fumigation for perennials.

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For More Details, Visit

- Poster location 3, Exhibit Hall, Session 1; or on the web (after January 2012) at AlmondBoard.com/AICposters
- 2010 - 2011 Annual Report CD (10-AIR5-Gao); or on the web (after January 2012) at AlmondBoard.com/ResearchReports
- Related Projects: 10-AIR9-Ajwa; 11-AIR6-Hanson/Fennimore