

# Minimize Emissions and Improve Efficacy of Soil Fumigations with Tarping of TIF

Project Leader: Suduan Gao

USDA-ARS, Water Management Research Unit, 9611 S. Riverbend Ave, Parlier, CA 93648

(559) 596-2870 suduan.gao@ars.usda.gov

## 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 the TIF tarp over time from different fumigant application rates and evaluate the waiting period between application and tarp-cutting to minimize potential exposure risks to workers and by-standers.

### 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 CDPH. 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 both in the lab and the field to prevent most off-gassing of applied soil fumigants. These totally impermeable tarps could reduce emission exposure concerns.

In addition, by virtue of holding the soil fumigant in the soil and/or at the soil surface longer, the use of TIF tarps may allow the rates of soil fumigants to be reduced. The efficacy of soil fumigants have always been limited by the uneven distribution in the soil over the top 2-3 ft.

The primary focus of the project is to assess whether the TIF tarps do provide more even distribution of the fumigant(s) and whether lower rates under the TIF tarps are effective.

Small plot experiments in the field have been initiated with TIF and different concentrations of fumigants applied. The soil fumigant concentrations at different depths are being monitored and efficacy assayed by monitoring placed nylon mesh bags with indicator species at different depths, residential nematode and native weed recovery.

Fumigant concentrations at soil surface below the tarp are being monitored over time to assess when best to cut the tarps.

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**Project Cooperators:** Greg Browne, USDA-ARS, Davis; James Gerik, Dong Wong, USDA-ARS, Parlier; Alfonso Cabrera, UC Riverside; Brad Hanson, UCCE - Davis; Ruijun Qin, UC Davis

### For More Details, Visit

- Poster location 29, Exhibit Hall, Session 1; or on the web (after January 2011) at [AlmondBoard.com/AICposters](http://AlmondBoard.com/AICposters)
- 2009-10 Annual Report CD (09-AIR5-Gao); or on the web (after January 2011) at [AlmondBoard.com/ResearchReports](http://AlmondBoard.com/ResearchReports)
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