Using TIF Tarp and Reduced 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.
- Determine if deeper injection can improve nematode control in soil below 3 ft depth.
- 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 and Discussion:

Almond growers rely on pre-plant soil fumigation to control soil-borne parasitic nematodes, replant disease, and deeply dwelling plant pathogens to establish new productive orchard when replanting. Soil fumigant use has been facing tremendous regulatory pressure because of exposure risks and VOC emissions; thus fumigation methods with high use efficiency of fumigant for pest control and low environmental impact are greatly needed for sustainable almond production. Using low permeability tarps such as totally impermeable film (TIF) has shown the potential to achieve this purpose because of its ability to retain fumigants under the tarp, increase fumigant concentration, improve distribution to increase fumigation efficiency, reduce emissions, and the possibility of using reduced rates.

In late 2012 and early 2013, a fumigation field trial using Telone® C35 was conducted in an almond orchard for replanting at Braden's Farm in Merced County. The field had a high nematode population. This trial determined that TIF tarp effectively reduced emissions and using reduced (2/3) rates with TIF resulted in similar nematode control as the full rate in soil above 3 feet depth. However, survival of nematodes in soil below 3 ft depth was observed regardless of tarps or rates. Following the trial, almond trees were planted in early 2013. All fumigation treatments improved tree growth significantly within the first year compared to the non-fumigated controls, but the differences were significantly reduced over time.

A new fumigation trial has been scheduled to be carried out in the middle of November 2014 in a grower's field. This trial will continue testing TIF with reduced rates on fumigant improvement, nematode control and tree response. An additional deep injection will be tested to determine if it can improve fumigant movement for better control of nematodes in deeper soils. Tree response from the previous trial and the new trial will be monitored. The effort will provide essential information on effective soil fumigation while minimizing environmental impact for perennial replanting in California.

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 53, Exhibit Hall A + B during the Almond Conference; or on the web (after January 2015) at Almonds.com/ResearchDatabase
- 2013-2014 Annual Reports CD (13-AIR5-Gao); or on the web (after January 2015) at Almonds.com/ResearchDatabase
- Related projects: 14-AIR9-Doll; 14-PATH1-Browne