The Intersection of Nutrient Availability and Produce Safety on Timing Organic Amendments

Project Leaders: Patrick Brown[1], Daniel Schellenberg[2]
Department of Plant Sciences, University of California, Davis, One Shields Ave., Davis, CA 95616
(530) 752-0929, [1]phbrown@ucdavis.edu; [2]dschel@ucdavis.edu

PROJECT SUMMARY

Objectives:

In the Central Valley of California, there is a critical need to improve the efficiency of conventional fertilizers and to integrate other nutrient sources like organic matter amendments into orchard systems. The abundance of dairy manure in the Central Valley represents an excellent source of organic matter and nutrients that could benefit soil tilth and tree health. Additional organic matter sources include green waste and cover crops. Improved utilization of these resources will contribute to reducing the nitrogen (N) loading to groundwater and benefit soil health. However, a number of concerns with the use organic matter from animal waste such as food safety, timing of release/removal of nutrients, and salts need to be addressed. .

Objectives for current year:

- To report the results of 12-PREC7-Brown
- To determine the effect of timing and form of organic amendments on nutrient availability and produce safety

Background and Discussion:

Anecdotally, many almond growers are incorporating organic matter into their growing practices. However, there is limited information on how best to utilize various forms of organic matter for better tree health and soil health, to ensure plant nutrition is enhanced and off-site movement of nutrients is avoided, and in the case of organic matter derived from dairies, ensure food safety. The latter is important with the Food Safety Modernization Act rules coming into force in 2015.

Current Almond Board Good Agricultural Practices for food safety recommend the application of manure-based organic amendments in winter. However, this is when nutrient uptake by trees is limited, increasing the potential for N loss to groundwater during rain events. A greater understanding of nutrient availability is needed.

The preliminary response rate from a survey mailed to all almond growers (13-PREC7-Brown) was 14% covering 216,300 acres. Organic matter amendment use during any stage of orchard development was most common in Stanislaus and Merced counties. Survey participants identified soil biology (48%) as the main benefit to an orchard from use followed by tree nutrition (40%). Responses show no differences in the timing of application with the vast majority of materials being applied from postharvest to bloom (80% - 95%). However, differences were more apparent from placement and management of composted manure and green waste compost on the tree berm (53% and 58%) compared to the alleyway with a greater incidence of no-tillage (76% and 80%). Growers report better access to animal manure compared to green waste. For composted manure, green waste compost, raw manure and uncomposted green waste, they identify food safety as the greatest issue of concern with nutrient availability playing a secondary role and cost & logistics being the least issue of concern of the three.

Project Cooperators and Personnel: Asmeret Asefaw Berhe, Teamrat A. Ghezzehei, Stephen C. Hart, UC Merced; Jeffery A. McGarvey, USDA; David R. Smart, UC Davis

For More Details, Visit

- Poster location 57, 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-PREC7-Brown); or on the web (after January 2015) at Almonds.com/ResearchDatabase