Poster Abstract

**Integrated Rotation Systems for Soil Borne Disease, Weed and Fertility Management in Strawberry/Vegetable Production**

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Continued growth of organic strawberry (*Fragaria* sp.) and vegetable production in coastal California faces major challenges. Soil-borne disease management without the use of chemical fumigants especially for Verticillium wilt (*Verticillium dahliae),* efficient nutrient management to prevent spring and fall leaching losses, and high costs for weeding are especially challenging areas. In conventional systems, due to stringent regulations and air quality concerns, the sustainability of chemical fumigant dependent systems is uncertain. Verticillium wilt is hard to manage given its wide range of host crops, long-lived propagules, and high sensitivity of strawberry to the disease. Among crops grown in this area, only broccoli, celery, and alliums are non-hosts, whereas lettuce, artichoke, tomato, potato, pepper, cucurbits, cauliflower, cabbage and spinach are hosts. This makes it difficult for diversified organic farms to devise crop rotations that include strawberries and avoid Verticillium hosts. A team of researchers, growers, farm advisors, and NGOs are tackling these issues by testing combinations of three non-chemical approaches: anaerobic soil disinfestation (ASD, an ecological alternative to methyl bromide fumigation); broccoli residue incorporation; and mustard cake application. Using fields highly infested with *V. dahliae*, we initiated replicated split-plot experiments with 3-year rotations: 1) broccoli-strawberries-lettuce, 2) cauliflower-strawberries-lettuce, and 3) fallow-strawberries-lettuce as main plots at one organic and one conventional farm in June 2011. Split plot treatments (ASD, mustard cake, ASD plus mustard cake, and untreated control) were applied prior to strawberry planting in Nov. 2011. An additional fumigant control split plot treatment, (PicChlor 60) was used in the conventional site. *V. dahliae* populations in soil, weed density, degree of wilt symptoms, soil-plant N dynamics, and crop yields will be monitored and net returns will be evaluated. Data on N dynamics and changes in viable *V. dahliae* population in soils during the first year are discussed.