

Project Summary

Development and Evaluation of a Raised Bed Trough Production System to Produce Strawberry Fruit Without the Need for Fumigants

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Soil borne diseases caused by *Verticillium dahliae*, *Macrophomina phaseolina*, *Fusarium oxysporum* and other pathogens are the main limiting factor for strawberry production without fumigants (Koike, et. al., 2010, 2011). These diseases also cause serious losses in fields treated with fumigants when part of the field remains untreated due to regulatory restrictions and the pathogen(s) gets spread throughout the field during land preparation. The continuing phase out of methyl bromide and increasing regulatory constraints on all fumigants threaten the continued viability of the 500 strawberry growers in California and the agricultural communities that depend on them. In other countries where fumigant use has been severely restricted, strawberry growers have turned to substrate based production systems to avoid soil borne diseases (Leitin and Baetes, 1991; Leitin, 2001, 2004). Research has shown that substrate production systems may be suitable alternatives for the strawberry production in the US and Canada (Kempler, 2002; Paranjpe et. al, 2003, 2008; Takeda, 1999). The California Strawberry Commission will continue the development of a soilless raised bed trough (RaBeT) system as an alternative to the current fumigant based production system. The RaBeT system is an adaption of the Dutch table-top soilless production system where strawberries are grown in peat or coconut coir based substrate. A trough is pressed into a conventional raised strawberry bed and lined with landscaping fabric which acts as a root barrier between the substrate and the untreated soil in the bed. Strawberries are then grown in peat or coconut coir in the trough thereby avoiding soil borne pathogens and potential crop failure. Preliminary results have shown that although the landscaping fabric does not completely prevent roots from penetrating into the soil, and fungal spores or nematodes can pass through the pores in the fabric, soil borne disease and nematode problems do not develop (Wang, 2010, 2011). Commercial fields in Holland have not developed disease or nematode infestations after 5 years of production in the same trough bed (D. Legard, personal communication). Research will be conducted to optimize the configuration of the trough, composition of the substrate, and to determine the proper fertilization and watering practices. On-farm demonstrations of the RaBeT system will be conducted in each of the main production districts to give growers hands- on experience with substrate production and use their expertise to optimize it. The cost of the trough system will be compared with the conventional fumigant based production system.

We expect the growers, shippers and processors of strawberries in California and the communities they live in will benefit from this project. The increasing regulatory restrictions on the use of fumigants have put the future of the strawberry industry at risk. Without the development of a viable production system for California strawberry growers to farm without fumigants, growers would be forced to either relocate their production outside of California or face unacceptable levels of risk of losing their crop to soil borne diseases. Our proposal to continue the development of a substrate based production system and to work directly with growers to optimize and extend information about the system, should provide growers with options that may allow them to continue to produce strawberry fruit in California.

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