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2013 DPR Alliance Grant Funded Project Summary:

Facilitation of the Anaerobic Soil Disinfestation Pre-Plant Soil Treatment

Amount Awarded: \$247,850

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Summary: This project introduces conventional berry growers to a method to reduce pests in soils without chemical fumigants known as anaerobic soil disinfestation (ASD) and to facilitate its adoption in California.

California berry growers require new methods and technologies to treat soilborne plant pathogens. With the phase-out of methyl bromide and limitations on availability and efficacy of other chemical fumigants other alternatives are required. California growers require pre-plant soil treatment methods to control soilborne pathogens, weeds, and nematodes. Methyl bromide the primary and most effective fumigant used in strawberries is due to be phased out as a result of the Montreal Protocol. This grant will be used to fund materials, consultation, and monitoring of field plots for 22 growers who use the ASD process. Some of these plots will serve as demonstration plots and be included in a field day educational event.

ASD is a four-week soil treatment process that is done before crops are planted and does not require the use of synthetic chemicals. It involves mixing carbon-containing compounds (e.g. rice bran, molasses) into the soil. Then the soil is irrigated and covered with a plastic tarp. The tarp deprives soilborne pests of oxygen and traps toxic byproducts produced by bacteria in the soil. The soil is then monitored for temperature and pH (acidity). For best results, the soil, irrigation and tarp are monitored for about three weeks. This process fits into the traditional field preparations completed before planting. It is a biological process that replaces chemical pre-plant pesticides.

Berries are a major commodity in California. More than 1.7 billion pounds of strawberries and raspberries are harvested in the golden state every year. Through the introduction of proven new methods to treat soil before planting, growers will gain access to new skills and materials through this grant.

Overall this project will offer educational events and publications. It will communicate to growers the ASD treatment process, current research, environmental and health benefits and cost compared to fumigant alternatives. The 22 sites and the educational events will be split between the northern and southern berry growing regions of California, so that more growers will have access to the demonstration plots and educational opportunities.

The ASD technique is used in Japan and Europe (the Netherlands). In the United States, the University of California, Santa Cruz has been researching this method for use in strawberry production. Through research trials ASD has successfully reduced or eliminated major plant pests from treated soil (including *Verticillium* spp.) and has produced yields comparable with fumigated control.

Additionally, the cost of ASD to growers is also competitive with current fumigation options. ASD likely produces no volatile organic compounds (VOCs) and can serve as a direct replacement for pesticides that is safe for human health and the environment.

The project's expected end result will be a solid demonstration of how ASD can work for conventional growers in terms of efficiency, cost, and scale. This project will also serve as a model for other crops, which may benefit from pre-plant soil treatment with ASD.

Adoption of the ASD process gives organic and conventional growers a viable option to treat soilborne pathogens without chemical fumigants. This means that conventional growers may gain the use of their fumigation buffer zone, while organic growers gain a significant tool in treating soil pathogens. Consumers benefit as ASD is cost competitive to other methods.