Evaluating novel nematicidal chemistry for usefulness in the nursery industry

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Project Summary/Abstract

Briefly describe the Jong-term objectives for achieving the stated goals of the project.

California agriculture has greatly benefitted from clean stock programs. The need for sustainable and effective prep/ant soil treatment of field sites for clean stock production is great. Regulatory guidelines of the Nursery Inspection Procedures Manual (NIPM-7) prescribe proper procedures for sanitizing nursery ground and alternative strategies to ensure clean nursery stock. With the discontinuation of methyl bromide, a true gap of treatment availability has arisen. In contrast to the efficacy requirements in commercial production fields, most complete nematode reduction is necessary to produce high quality stock. In a prior effort graciously supported by this program, my laboratory has intensively examined the efficacy of several new experimental nematicides. A high-volume non-fumigant material was identified to have potential for successful nematode suppression. This material, not labeled yet could possibly be quickly implemented. However, we have observed the greatest level of nematode suppression using a chemical-independent approach to soil fumigation known as anaerobic soil dis infestation (ASD). It is the objective of this proposal to improve and simplify application techniques and strategies of these methods. Both the chemical and this biorational method require tarp cover with totally impermeable film (TIF) on top of a complex net of drip irrigation lines to accommodate soil drenching with 6 acre inch of water. In addition, ASD is logistically demanding for transporting, spreading and incorporating carbon substrate before the watering regiment is implemented. The currently most reliable substrate is rice bran, which is quite costly. Alternative substrates have been tested in other projects but need more refinement to be useful for nursery applications. Simplifications and cost savings are urgently needed to make these methods commercially acceptable

Scope of Work

Describe the goals and specific objectives of the proposed project and summarize the expected outcomes. If applicable, describe the overall strategy, methodology, and analyses to be used. Include how the data will be collected, analyzed, and interpreted as well as any resource sharing plans as appropriate. Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the goals and objectives.

This is an ongoing project. Prior experimentation had determined that Dominus drench application and anaerobic soil disinfestation (ASD) with 9 tones/acre of rice bran were effective in reducing population densities of plant-parasitic nematodes throughout 5-ft depth. It is the aim of this project year to optimize application schedules. In related projects, preliminary data illustrated that 1 /3 of the currently prescribed rice bran amount may be sufficient to afford efficacy. In an open-field experiment in nematode-infested soil, Dominus will be applied at its known effective rate. To confirm preliminary information on required watering schedules, different amounts of treatment watering will be applied to plots with the rice bran amendment amounts of 9 tones/acre. In addition, reduced amounts of rice bran substrate will be tested. In the search of further cost savings, the use of olive pomace and cotton seed meal at the 9 tones/acre rate will be included in this tnalmg. Soil samples will be taken pre-and post-treatment. The plots will be sufficiently large to allow for the planting of one row of Prunus rootstock 'Krymsk86', one ½ row of walnut seed
'Chandler' and one½ row of grape. At harvest maturity of the nursery crops, root samples for nematode extraction will be taken. This procedure will allow for determining if treatments were effective, and if this effectiveness was sufficient to procure freedom of nematode infection.

Field plots will be established during the summer, and treatments timed to allow for planting of nursery plugs in the following spring. The one-year data will provide important predictive power of which treatments may require post plant treatments with the tested nematicides.