CITRUS ADVANCED TECHNOLOGY PROGRAM

QUARTERLY & FINAL REPORTS: Control of Citrus Greening, Canker & Emerging Diseases of Citrus

SELECT PERIOD March 2013

Quarterly Report Final

Proposal Title

MANAGING ROOT HEALTH BY EXPLOITING BENEFITS AND MITIGATING CHALLENGES AFFORDED BY NEMATODES

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
5/21/13	Citrus Research and Development Foundation	Epidemiology and Cultural Control

REPORT UPDATE (500 words-It is not necessary in this public report to disclose your institution's proprietary information or intellectual property.)

Entomopathogenic nematodes: Amending soils to increase biological control of insect pests

We sampled the Bartow experiment in which soil pH was reduced with elemental sulfur. Soil pH was significantly reduced in December 2012, but the treatment had no effect on population density of Paenibacillus sp. or Steinernema diaprepesi (December report). By February-March the bacterial populations in control plots (high pH) were nearly 18-fold greater (P=0.02) than in sulfur treated plots. The S. diaprepesi populations were more than twice as large in sulfur treated plots as in untreated ones (P=0.04). Therefore, we have increased an indigenous entomopathogenic nematode population by modifying the soil chemistry, and a corresponding reduction in levels of a natural enemy of the nematode suggests a mechanism for the response we observed. We observed an additional potential benefit of reducing soil pH at this site, because citrus nematode numbers from December through March were 4-fold greater (P=0.02) in control plots than in plots treated with sulfur. However, there was a slight non-significant trend toward fewer fibrous roots on sulfur treated trees that requires further study. We will continue to evaluate the effect of this treatment quarterly throughout 2013. We are also evaluating the effects of soils from the two treatments at Bartow on the EPNs S. diaprepesi and H. indica independently of the bacterium in controlled studies in the laboratory.

The manuscript "New citriculture system suppresses native and augmented entomopathogenic nematodes" Campos-Herrera, R., Pathak, E., El-Borai, F., Schumann, A., Abd-Elgawad, M.M., Duncan, L.W. was accepted for publication in Biological Control.

Plant parasitic Nematodes: Characterizing a new nematode pest and the prevalence of resistance breaking populations of the citrus nematode.

We Initiated a nematicide trial to evaluate the tree response to dagger nematode control in an 8 acre block of 3-year-old Flame grapefruit on Cleopatra mandarin rootstock. Valves were installed variously at north and south ends of 8, double-row beds in order to created 12 untreated plots of 8 trees each, paired with 12 Vydate-treated plots of 8 trees each. Valves were also installed on additional beds to prevent Vydate treatment of trees. Some of these beds were plumbed to receive a dose response trial of an experimental DuPont compound that has shown excellent efficacy against sting nematode, Belonolaimus longicaudatus. The DuPont compound has an added benefit of a much lower mammalian toxicity than does Vydate. Other beds were plumbed to receive treatments to evaluate 2 experimental nematicides being developed by Bayer. The site had very regular and abundant levels of dagger nematodes across all beds and HLB is evident throughout the block. The 3 trials initiated here should provide important information about the effects of these nematodes on HLB affected trees and also generate data concerning the efficacy of urgently needed additional nematicides for use in Florida.

PI First Name Larry

PI Last Name Duncan

Email lwduncan@ufl.edu

Phone 8639568821

Organization UF, IFAS, CREC

Project Number 525

Project Duration (years) 3 *Year of Project* 1

Total Funds (current year) $38,615.00

Form PR-12 Quarterly Reports SUBMIT REPORT

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.