CITRUS ADVANCED TECHNOLOGY PROGRAM

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

SELECT PERIOD December 2016

(●) *Quarterly Report* ( ) *Final*

Proposal Title

The leaf litter cycle of citrus black spot and improvements to current management practices

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
09/26/2016	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.)

December 2016

The objectives of this proposal are 1) to determine if a) leaf litter biodegradation treatments reduce Guignardia spp. pseudothecia and improve control afforded by routine fungicide applications; b) if biodegradation is affected by the current fungicide application practices; and c) whether the biodegradation treatments will affect current citrus best management practices (BMP); 2) to determine the seasonal dynamics of leaf litter inoculum load in varying management regime intensities and how environment affects pseudothecia production in the leaf litter; 3) to test if the resistance to black spot in the leaves and fruit in sour orange is correlated and under simple genetic control through laboratory and field testing of progeny of sour orange crosses in both Florida and Australia.

In the large field trial, there was a greater amount of G. citricarpa DNA found in 2016 leaf litter and the presence was more consistent than 2015. From 2014 to 2016 the number of Phyllositca spp. structures consistently increased significantly ($P < 0.05$). The soilset treatment had the lowest disease incidence in 2015 (1st year trt) and 2016 (2nd year). The third year treatment was applied and will be assessed next spring. The fruit from the 2016 application has not yet been evaluated.

The bagasse field trials confirmed the laboratory experiments that bagasse increased the leaf decomposition rate compared to nothing or urea. Greater soil moisture also accelerate leaf decomposition. The final publication was the citation: van Bruggen, A.H.C., Sharma, K., and Shin, K. 2017. Sugar cane processing residue, bagasse, enhances decomposition of citrus leaves and could contribute to citrus black spot management. Crop Protection 93: 89-97.

The detached leaf assays for assessment of leaf susceptibility continue. There was an out break of mites in the greenhouse that slowed the leaf production process for the leaf assay. We have treated for mites and the experiment continues.

Collection of leaf samples from the grove in Immokalee has continued biweekly. Each batch of samples contained 40 samples of 25 leaves collected below 40 trees. Leaves were examined under microscope to check for fructification of Phyllosticta spp. Leaf portions without fructification were discarded and the remainder were immersed in 0.02% tween20 to collect conidia and ascospores. Conidia and ascospores produced in leaf litter were quantified, weather data were collected from FAWN. Data collection is continuing and some of the qPCR data is being processed. In 2014, very little G. citricarpa DNA was found overall while G. mangiferea was high but, substantially more G. citricarpa DNA was detected in the 2015 collections. In general, conidia are always present but ascospores are related to the level of leaf decay. Because there was an increase in pathogen presence in 2015, we have decided to continue sampling since levels were very low in 2014. There appears to be more asexual structure formation in the spring of 2016 than 2015 and greater conidia production. In 2016, fewer ascospores were observed in the spring than in 2015 but in general the overall trends were similar. The summer data had similar trends from previous years but the level of P. citricarpa DNA increased overall and was more consistently found among samples.

In Australia, confirmation of the ascospore and conidia production results continues. Sampling of leaf litter in two groves in

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Form PR-12 Quarterly Reports **SUBMIT REPORT**

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