NE-1640 Regional Nematology Research Committee meeting, University of Hawaii, Oct. 17-19, 2019

Marisol Quintanilla, Chair
Administrative Advisor: Mark Rieger

Attending: George Bird (Michigan State University), Billy Crow (University of Florida), Jim Kotcon (West Virginia University), Jim LaMondia (Connecticut Agricultural Experiment Station), Nathaniel Mitkowski (University of Rhode Island), Deborah Neher (University of Vermont), Marisol Quintanilla (Michigan State University), Koon-Hui Wang (University of Hawaii), Andreas Westphal (University of California Riverside), Brent Sipes (University of Hawaii), and Ernie Bernard (University of Tennessee)

A pre-meeting Wednesday dinner was held at the International Marketplace, Waikiki.

After a Call to order, Walter Bowen, Associate Dean for Research at the Univ. of Hawaii Center for Tropical Agriculture and Human Resources, gave a welcome. Announcements regarding local arrangements were given by Koon-Hui Wang. Jim Kotcon was appointed to serve as secretary.

Presentations

Marisol Quintanilla (Michigan) described research on cropping systems and plant parasitic nematodes. Soybean cyst nematode is increasingly able to overcome resistance in available soybean cultivars, with resistance from Peking apparently breaking faster than PI88788. Yields were best when cultivars with different resistance sources were rotated. A variety of soil amendments and seed treatments were evaluated. In sugar beets, Abamectin was the only treatment that performed better than the control for sugar beet cyst nematode. In corn, stunt and root lesion nematode appear to be the most important nematodes causing yield loss. In carrot, *Pratylenchus penetrans* was found to cause damage while *P. neglectus* was less aggressive. Additional trials with potato, tree fruits and blueberry were described.

William Crow (Florida) identified damage thresholds for lance nematode on Bermuda grass. Trials with abamectin, fluopyram (Indemnify), fluensulfone (Nimitz), 1,3-D (Curfew), and *Burkholderia* (Majestene) demonstrated that nematodes differed in their response. Products such as abamectin gave control of *Meloidogyne graminis*, but do not penetrate deep enough to provide control of *Hoplolaimus* spp. As a result, Lance nematode (*Hoplolaimus*) is now the dominant pest in turf. Additional work evaluated problems with Aphelenchoides besseyi on strawberries, as well as other foliar nematodes in ornamentals. Nematode problems in sugarcane include sting nematode (*Belonolaimus*), *Meloidogne incognita*, and fields with *Rotylenchulus*, *Hemicycliophora*, *Mesocriconema* and an undescribed species of *Pratylenchus*. The Florida Diagnostic Lab over 5400 samples per year and participated in 22 stakeholder events with a total of 1395 attendees.

Nathaniel Mitkowski (Rhode Island) found that Fluazaindolizine (Salibro) had no effect on lance nematodes on bentgrass turf. He found that fluopyram (Indemnify) works quickly on root knot or stunt nematodes, but like abamectin, does not penetrate the thatch layer to reach deeper roots. He found a damage threshold for lance nematode of 1000/100 cc soil, whereas Florida and Massachusetts suggest thresholds around 400/100 cc soil.

George Bird (Michigan) reported a chromosome number of four for *Meloidogyne natalei*, which suggests it may represent a basal clade for the genus. He is continuing work on thermal imaging to develop Thermal Stability Maps for potato. Areas of fields with “stable cool” temperatures generate the

highest yields. He also reported the first yield data from a long-term cherry orchard project comparing diverse ground covers. Areas with buckwheat/pea covers had higher cherry yields than oats/red clover. Yields from plots with Essex rape and pearl millet were intermediate. He also continues to be active with the Soybean Cyst Nematode Coalition. He reports that they have published 367 on-line articles which have received 16.4 million "impressions". They also produced nematology short courses targeting agribusiness professionals.

Deborah Neher (Vermont) is working with lettuce growers contending with diverse root diseases. Trials evaluated Anaerobic Soil Disinfestation using molasses as a carbon source, and vermicompost. Trials in tomato are evaluating dairy manure, poultry pellets and Osmocote (fertilizer). Bacterial communities in soil with vermicompost differed greatly from those in soil with dairy manure or poultry pellets.

Jim LaMondia (Connecticut) is evaluating rotation crops in strawberry. Trials included sudan grass, pearl millet, black oats, *Rudbeckia*, and 'Dwarf Essex' rape. He also evaluated tobacco cyst nematode as a model to evaluate trap crops of potato cyst nematode and found that *Solanun sisymbriifolium* stimulates hatch from cysts up to 90 cm from the plant. He reported that Beech leaf diseases (*Litylenchus crenatae mccannii*) was present in at least three locations in Connecticut.

Koon-Hui Wang (Hawaii) is working with Philip Waisen on biofumigation and cover crops for root knot and reniform nematode management. Brown mustard showed trap crop activity against root knot (but not reniform nematode), as well as biofumigant activity. Suppression of soilborne diseases in banana by drenches with teas of various soil amendments was evaluated. Treatment with fluopyram (Velum) was effective for control of root knot, but not reniform nematode. Azadirachtin (Molt-X) was effective for reniform nematode if injected monthly.

Andreas Westphal (California) conducts research in nematode diseases of perennial crops (grape, walnut, citrus). Walnut rootstocks were evaluated for resistance to *Pratylenchus vulnus*, but high variability from year to year means long-term trials are necessary. Fluazaindolizine (Salibro), allyl isothiocyanate (Dominus) and Anaerobic Soil Disinfestation gave good suppression of *P. vulnus*. Various cover crops were evaluated for suppression of *P. vulnus*, with Sunn hemp showing high resistance, while various radishes gave variable results.

Ernest Bernard (Tennessee) evaluated population density of *Pratylenchus scribneri* and *Helicotylenchus pseudorobustus* on pasture forages. Crops and nematodes differed in responses, with no single forage suppressive to both nematodes. Resistance to *Meloidogyne incognita* in hemp cultivars was compared. Most cultivars were heavily galled 60 days after inoculation with 5000 eggs, but 'Wife' had only two galls and no eggs were produced. A virus was isolated from soybean cyst nematode that also infects Meloidogyne. The virus was transmitted to tomato, appears to be transmitted transovarially to eggs and infested eggs transmitted the virus to healthy plants.

Jim Kotcon (West Virginia) reported on a 20-year trial comparing organic farming systems. Populations of plant parasitic nematodes remain low, and consistent differences among treatments were rare. An assay of nematode biocontrol activity found significantly higher levels of nematode suppressiveness in 2019 than in the early years of the trial, however differences between manure-amended or unamended plots were not significant. The number of nematode trapping fungi/g soil (mostly *Arthrobotrys oligospora*) was significantly higher in 2019 than in 2001, but also did not differ significantly between manure-amended and unamended soils. Three quinoa cultivars (Temuco, Oro de Valle, and Black) were

evaluated for susceptibility to *Meloidogyne hapla* and *M. incognita*. Few galls and almost no egg production were found with *M. incognita*, but *M. hapla* reproduced well on all three varieties.

Business meeting

Nathaniel Mitkowski agreed to circulate a report template and will contact the Administrative Adviser to allow access by Marisol to the report web page. The final report is due 90 days after the meeting.

A grant proposal seeking funds for the NE1640 webpage was denied as the Committee is not eligible for that program.

The project proposal indicated that nematology workshops should be planned for ornamentals, vegetables, and fruit crops. Bill Crow, Jim LaMondia, and Ernest Bernard will work on finding a venue for an ornamental nematodes workshop, possibly the Philadelphia Flower Show or the Society American Florists. A vegetable nematology workshop was suggested for the Great Lakes Vegetable Conference.

Development of proposed webinars was tabled because some speakers have left the project, and new members need technical support to produce these.

Jim Kotcon moved that the Committee accept the invitation from Connecticut to host the 2020 meeting. Debra Neher seconded, motion carried.

Koon Hui Wang moved to adjourn. Jim Kotcon seconded. Motion carried. The business meeting adjourned at 5:11 PM on Oct. 18.

Field Trips

Three field trips were organized by Koon-Hui Wang. One trip examined toured the coconut rhinoceros beetle quarantine facility at the Univ. of Hawaii. A second trip visited the Dole Plantation to observe pineapple, coffee, and cacao production and there was a focus on the impact of reniform nematode on pineapple production. The third trip toured the Kunia Country Farm to review sustainable vegetable production, aquaponics, heirloom sugar cane cultivation, and rum production.

Respectfully submitted by:

Jim Kotcon, West Virginia University