**Minutes of the NE-2140 Regional Nematology Research Committee meeting, University of Tennessee, Oct. 4-5, 2023**

Nathaniel Mitkowski, Chair.

Administrative Advisor: Anton Bekkerman

**Attending:**

In person: Ernie Bernard (U. Tennessee), George Bird (Michigan State U.), Jim Kotcon (West Virginia U.), Horacio Lopez-Nicora (Ohio State U.), Marisol Quintanilla (Michigan State U.).

Via ZOOM: Frank Hay (Cornell), Mihail Kantor (Penn State), Nathaniel Mitkowski (U. Rhode Island), Lesley Schumacher (USDA-Tifton, Georgia), Chris Taylor (Ohio State U.), Koon-Hui Wang (U-Hawaii), Andreas Westphal (California).

.

Also: Anton Bekkerman, Billy Crowe (UFL), Haddish Melakeberhan (Michigan State U.).

Absent? Carmen Ugarte, Senyu Chen, Deb Neher, Stephen Meyers, Alexandra Smychkovich

**Meeting Agenda:**

After a Call to Order, Ernie Bernard welcomed the group to Knoxville. Jim Kotcon was appointed to serve as secretary.

Presentations

**James Kotcon** (West Virginia) reported on nematode population dynamics in a long-term organic farming systems trial. Cereal crops (corn, wheat, and orchard grass) increased population density of *Helicotylenchus, Tylenchorhynchus* and *Mesocriconema* spp., but no differences were found for *Pratylenchus, Hoplolaimus, Xiphinema* or Mononchid nematodes. Compost amendments increased the ratio of bacteriovore to fungivore nematodes. Lesion nematode species differed in their reproduction on industrial hemp cultivars. *Pratylenchus penetrans* tended to reproduce more than *P. scribneri*, except on the cultivar Orion, indicating that resistance may be species-specific. On-going work is evaluating the role of migratory songbirds as vectors for the Beech Leaf Disease nematode (*Litylenchus crenatae mccannii*). The efficacy of nematode trapping fungi is being compared for several species of plant parasitic nematodes.

**Haddish Melakeberhan** (Michigan) described work using a Soil Food Web model by Ferris et al. to assess whether soil health parameters affect the Northern Root Knot nematode (*Meloidogyne hapla*). He evaluated soil microbial communities associated with soil health and *M. hapla* to evaluate why populations reproduce at different rates on the same host. Highest reproduction tended to occur in degraded soils. Community DNA analyses found associations between *M. hapla* and bacterial, but not fungal, OTUs.

**Horacio Lopez-Nicora** (Ohio) screened soybean cultivars for resistance to the Soybean Cyst nematode (*Heterodera glycines*). Of resistant varieties screened in the greenhouse, 55 % were actually moderately susceptible. In field surveys, *H. glycines* was present in 65 % of soil samples assayed and HG Type 2.5.7 was most prevalent. This HG Type could reproduce on varieties with resistance from PI-88788, which is the source of resistance for 70 % of varieties available, suggesting a serious risk of future problems. He also evaluated the herbicide dicamba on hemp and found that higher doses reduced the nematode Maturity Index in treated soils.

**Ernie Bernard** (Tennessee) assessed the impact of microplastics on soil nematodes, springtails and millipedes. Particles with diameters of approximately 250 micrometers had no impact on cucumber root growth or weight, root infection or galling by *Meloidogyne incognita*, or nematode survival over six months.

**Marisol Quintanilla** (Michigan) described research on crop rotations with resistant and susceptible cultivars for Soybean Cyst nematode. Rotating cultivars with resistance from PI-88788 and Peking was the best whereas continuous Peking did worst after four years. She recommends a rotation of 2 years of PI-88788, and one year of Peking soybean varieties alternating with nonhost crops. Lesion nematode species varied in their impact to wheat cultivars, with reduced root weight associated with *Pratylenchus neglectus* and *P. penetrans*, but not *P. crenatus*. The entomopathogenic nematode *Steinernema feltiae* suppressed Spotted Wing Drosophila in field trials. She also reported on studies of compost amendments to reduce Potato Early Dying caused by *P. penetrans* and the wilt fungus, *Verticillium dahlia*.

**George Bird** (Michigan) described outreach using a Soybean Cyst Nematode Profit Calculator based on soil type, soil pH and nematode population density. A long-term potato soil health study sampled 68 sites in 2022 and compared results of the Cornell Soil Health Test to results from those sites in 2012. After ten years of soil health management, 100 % of sites increased available water holding capacity, soil organic matter content and active carbon, while 94 % of the sites had reduced population density of *P. penetrans*. Sites treated with soil fumigation had reduced soil aggregate stability, active carbon and nitrogen mineralization.

**Andreas Westphal** (California) is working to assess walnut rootstocks for resistance to *Pratylenchus vulnus*, and other pathogens integrated with nematicide treatments. Dominus (allyl isothiocyanate) and Telone (1,3-dichloropropene) gave good suppression of *P. vulnus* and increased yield of walnut by over 200 %. Anaerobic soil disinfestation with brassica, Crotalaria, and sudangrass also reduced *P. vulnus*. He also found *Meloidogne floridensis* as an emerging pathogen on grape and almond. The Nemaguard rootstock (resistant to *M. incognita*) allowed high reproduction of *M. floridensis*.

**Koon-Hui Wang** (Hawaii) found that Reniform nematode (*Rotylenchulus reniformis*) was more damaging to sweet potato than Root Knot nematodes. She evaluated cover crops suppressive to nematodes and found that velvet bean, sunn hemp and sudangrass reduced nematode population density, however sunn hemp required irrigation to produce adequate biomass, whereas velvet bean and sudangrass yield well without irrigation. Velvet bean increased ammonia nitrogen and carbon sequestration and reduced damage from weevils.

**Chris Taylor** (Ohio) described work to elucidate etiology of damage from Beech Leaf Disease nematodes (*Litylenchus crenatae mccannii*). Highest population levels occur in leaves in September and nematodes overwinter in beech buds where they feed on embryonic leaves. He also was able to culture at least 20 fungi from leaves, but only *Colletotrichum fiorini* was limited to symptomatic leaves.

**William Crow** (Florida) reported that resistance to Indemnify (fluopyram) may have appeared in some Sting nematode (*Belonolaimus*) and Grass Root Knot nematode (*Meloidogyne graminis*) populations but still gave some control of Lance nematodes (*Hoplolaimus*). A new nematicide, Salibro with Reklemel Active (fluazaindolizine), provides short-term control, so a rotation of the two nematicides is recommended.

**Lesley Schumacher** (USDA-Georgia) will begin work with peanut cultivars with resistance to Root Knot nematodes. She also described research into evaluating seed mixes of soybean varieties with Soybean Cyst nematode resistance from PI-88788 and Peking to create a “refuge in a bag” that may slow selection for resistance to PI-88788. Mixtures may provide a yield advantage over monocultures in fields with high Soybean Cyst nematode population densities.

**Nathaniel Mitkowski** (Rhode Island) reported that Salibro gave excellent control of Lance nematode but had no effect on Stunt, Spiral or Ring nematodes. Fluopyram gave broad spectrum control of most plant parasitic nematodes and has a longer half-life in soil. He found that fluopyram was effective for Beech Leaf Disease if applied to foliage.

**Mihail Kantor** (Pennsylvania) has begun work on Beech Leaf Disease and found the nematode in every county in Pennsylvania surveyed. He did not find *Colletotrichum* in leaves. He did find live nematodes (*L. c. mccannii*) in frass from caterpillars.

**Frank Hay** (Cornell) surveyed onion producers and found Lesion nematodes were common. Stubby Root nematode (*Paratrichodorus*) was associated with stunted patches. The nematode is difficult to detect in dry soils but is known to vector Tobacco Rattle Virus. He has nematicide trials underway and will evaluate rotation crops for suppressiveness.

**Business meeting**

Nathaniel Mitkowski agreed to circulate a report template and will contact the Administrative Adviser. The final report is due 90 days after the meeting.

The NE-2140 project was nominated for a Multi-state Excellence Award.

The need for Impact Statements was discussed, and a Mid-Term review by the Administrative Advisor will be needed. Planning for a renewal should begin in 2024.

Mihail Kantor agreed to host the 2024 NE-2140 meeting in Pennsylvania.

William Crow was selected as Secretary for 2024, and will serve as Chair in 2025.

The business meeting adjourned at 11:05 AM on Oct. 5.

**Field Trips**

A post-meeting field trip to the Bernard lab allowed participants to learn about nematodes extracted from millipedes. Nathaniel Mitkowski suggested that we invite retirees to participate in future meetings, at least via ZOOM.

Respectfully submitted by:

Jim Kotcon, West Virginia University