

Chat questions from Elson's nematode seminar, Feb. 18 2021.

**Are there any concerns about moving these nematodes to other geographies?**

The species of entomopathogenic nematodes in this research are common throughout the US. However, they do not commonly exist together under natural conditions and appear to have evolved in different types of soils and native habitats. When we convert this land to agriculture, the natural existing EPNs do not seem to have the ability to suppress the agricultural insects which move into the field because they evolved on a different set of insects. By mixing nematode species to match the agricultural insects, efficacy is significantly improved over the single species of EPN typically in the field from evolutionary time.

**Julie Peterson, Univ Nebraska – North Platte:** We have studied west central Nebraska continuous corn fields (commercial farmer's fields) and found that there are the same nematode species as Elson's already present, but at much lower levels, and as Elson said "not doing a good enough job on their own" --- so we could see these applications as adding to what is already present in our fields in Nebraska

**Could they negatively impact beneficial insects?**

Research has shown that there is minimal impact of EPNs on beneficial insects.

**What regulatory requirements are there?**

Entomopathogenic nematodes are unregulated by EPA, USDA or other US government agencies. Native US EPN species which also occur naturally in Canada, can be imported into Canada without an importation permit.

**What is involved in testing soil for nematode occurrence?**

Testing soil samples for entomopathogenic nematodes is different than for plant parasitic nematodes. It involves baiting the soil sample with an insect host, incubating the sample at room temperature for 7-days and then evaluating the host larvae for infection by entomopathogenic nematodes.

**What should the testing protocol be to confirm presence and persistence of EPNs?**

In a research setting, soil samples are bioassayed for EPNs 1) 30-45 days after application to confirm a successful inoculation, 2) At the end of the season to confirm EPN presence/persistence going into winter and 3) In the spring when soil temperatures warm to 50 F (10 C) to confirm persistence across the winter. In subsequent years, this soil bioassay is reduced to 2X per year (fall and spring).

Since we have never had an inoculation failure or persistence failure in over 300 field applications across the US under varied field/climate conditions, testing for a commercial application should be unnecessary unless there is reason to suspect that the EPNs were not viable when applied (directions not followed, kept too long in the spray tank/liquid manure) or pest damage was observed, suggesting the EPNs were not effective.

**How many labs can do this work?**

I am unaware of any commercial labs which bioassay soil samples for the presence of entomopathogenic nematodes.

**Were yield data estimated in any of the TX trials?**

No, these were small plots grown for silage.

I wish more yield data were available. After all, that, is the bottom line.

Stand by for NM data. We need better funding to do large plots for yield.

I am impressed and I like the translation into \$\$.

Yes, but now we need some good replicated work. The problem is the nematodes move a lot in the field on cattle hooves and equipment. That is part of why we had to abandon Dalhart; our check plots (spatially distant from treated plots) were overrun with nematodes after 2 years.

**Any parasitic nematodes attacking pest nematodes? I live in the Columbia Basin and potatoes are on three year rotations because of nematode problems.**

Not that I am aware of.

**Do you recommend to apply nematodes after a rain?**

Application after a rain which improves the soil moisture and helps the EPNs move into the soil. Application using stream nozzles which apply the nematodes in a high concentration in a narrow stream of water also achieves easy entry into the soil.

**Would several years out of corn risk reduction in nematode persistence?**

No, these native persistent EPNs persist across rotations of alfalfa, grass and soybeans. There are plenty of other soil insects in these crops to allow the EPNs to persist and multiply.

**Is there a pH effect on the live nematodes? We have some pretty high above 7.5**

No impact with pH. 20% of NY soils have a PH of 8, including the field where the long-term CRW-EPN trial was conducted. In addition, the soils in Roswell, NM have a high PH.

**Are there any concerns with seed treatment offerings on the market that contain nematicides causing any issues with nematode establishment and longevity?**

None that we know of at this point in time.

**What about tillage behind EPN application?**

No negative impact to tillage. Tillage moves EPNs so tillage after application will help to spread the EPNs between the application strips from the stream nozzles located 24" apart.

**Does Seed Applied Insecticide have a negative impact on Entomopathogenic Nematodes?**

We have not seen any impact. All of the research to date are in fields using seed applied insecticides.

**Does the commercial company that sells these nematodes do the application as well?**

The commercial company, Persistent Biocontrol, supplies the nematodes and will advise/assist the farmer during the first application to teach the correct methods of application. After the first application, the farmer should be able to apply the nematodes to subsequent fields. Application of nematodes is no harder than applying a pesticide, but has some different aspects since nematodes are alive.