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RECENT FIELD FINDINGS OF SOYBEAN CYST NEMATODE IN MANITOBA

Dr. Mario Tenuta, University of Manitoba, has visually confirmed the presence of soybean cyst nematode (SCN) on soybean roots in Manitoba fields.

He and his students have sampled commercial fields since 2012, detecting the SCN only through molecular methods. In 2019, one field in each of the Rural Municipalities of Emerson-Franklin, Montcalm, Rhineland, and Norfolk-Treherne had confirmed SCN on the roots, totalling four fields.

Soybean cyst nematode (*Heterodera glycines*) feeds on soybean roots, causing yellowed leaves, stunted plants and yield loss. In the Manitoba SCN identified fields, economical damage was not observed.

SCN cysts on roots are tiny (<1 mm dia.) and just visible to the naked eye. Early detection is labour intensive, digging up plants with roots attached, soaking roots to wash off soil and then examining roots for lemon-shaped cysts. Because of this, early detection seldom occurs and SCN is not identified until pest levels are high enough to cause aboveground symptoms on soybeans.

SCN has spread steadily throughout North America with soil movement on plant material, tillage equipment, vehicles and by wind or water movement. The arrival in Manitoba was expected, but spread and establishment can be reduced by preventing soil movement between fields.

In addition to reducing soil movement, crop rotation is a tool to reduce establishment. *Soybean growers should consider rotating with non-host crops for 2 to 3 years,* which includes soybeans, edible beans and field peas. Growers are also encouraged to use SCN-resistant varieties in Rural Municipalities with positive cases.

For more information on soybean cyst nematode and appropriate management to minimize its impact, call Manitoba Agriculture at 1-844-769-6224 (toll-free), or visit:

- https://www.manitobapulse.ca/2019/03/soybean-cyst-nematode/ (Manitoba Pulse & Soybean Growers)
- https://www.gov.mb.ca/agriculture/crops/biosecurity-agronomist.html (Manitoba Agriculture)
- https://cropprotectionnetwork.org/resources/articles/diseases/soybean-cyst-nematode-of-soybean

MANITOBA Pulse Soybean GROWERS

University of Manitoba

BACKGROUND

Several surveys of commercial soybean fields in Manitoba for soybean cyst nematode have been conducted by the University of Manitoba. In fall 2012 and spring 2013, 46 fields were sampled for soil and another 28 fields soil sampled in fall 2014 and spring 2015. Samples were analyzed at the Applied Soil Ecology laboratory at the University of Manitoba using a United States Department of Agriculture, Nematode Cyst Extractor and 5 lb weight of soil of each sample. All samples from those surveys did not yield any cysts of the soybean cyst nematode.

A third soil survey was conducted in fall 2017 on 30 commercial fields in Manitoba. Cysts were recovered from 12 fields though most were broken and not filled with eggs making determination of nematode species impossible. However, intact cysts that matched the appearance of the soybean cyst nematode were found in seven of the fields. Four fields had cysts in good condition to conduct molecular DNA analysis. The levels of cysts in those fields were extremely low being 2, 1, 14, and 14 cysts per 5 lbs soil in each of the fields. Molecular DNA analysis of the eggs in the cysts using several methods (including two diagnostic PCR and sequencing of multiple DNA gene targets) revealed the cysts to be that of the soybean cyst nematode. Soil samples of the four fields were held in storage, then extracted for cysts in May 2019. The four fields again had cysts similar to soybean cyst nematode in appearance. Two of the fields had cysts in good enough shape to examine their molecular DNA and again, cysts from these matched the DNA of soybean cyst nematode. In May 2019, the four fields were re-visited and soil sampled again. Two of the fields had cysts (2 and 20 per 5 lbs soil) consistent with being that for soybean cyst nematode.

Recently in August 2019, the field with the highest amount of cysts was visited to check for the presence of the nematode on roots as soybean is planted this year. Some soybean plants had a few white to yellow lemon-shaped cyst nematodes on their roots, consistent in appearance to that of soybean cyst nematode females at the stage of soybean growth. The field had no visible disease symptoms indicating damage from the nematode (e.g., stunting, poor canopy closure, chlorosis).

In conclusion, the latest survey for soybean cyst nematode, resampling of positive fields and presence of the cysts on soybean roots in the field confirm the presence of the nematode in Manitoba. The fields in which the nematode was found occur in the RMs of Norfolk-Treherne, Rhineland, Emerson-Franklin, and Montcalm. The cyst levels are extremely low and consistent with recent establishment of the nematode. For comparison, soybean cyst nematode levels in areas of Ontario and the US mid-West where the nematode has been present for many decades can be 3,000-4,000 cysts per 5 lbs soil.

This research is conducted by Ph.D. student, Nazanin Ghavami of the University of Manitoba and is a collaborative effort between the University, the Manitoba Pulse and Soybean Growers, and Manitoba Agriculture. This research is funded by the Manitoba Pulse and Soybean Growers, Manitoba Agriculture, and the Western Grains Research Foundation. Albert Tenuta of the Ontario Ministry of Agriculture, Food and Rural Affairs is a project collaborator.