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A 10-Year Summary of Testing for Nematodes that Feed on Corn in Iowa

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Abstract

The Iowa State University (ISU) Plant and Insect Diagnostic Clinic is the only facility in Iowa that extracts and identifies plant-parasitic nematodes from soil and root samples submitted by farmers and those who advise them. The results of testing for nematodes that feed on corn in Iowa from 2000 to 2010 were summarized and published in an article this week titled “Testing for Plant-parasitic Nematodes that Feed on Corn in Iowa 2000-2010,” by G.L. Tylka, A.J. Sisson, L.C. Jesse, J. Kennicker, and C.C. Marett in the online journal [Plant Health Progress](#).

The main findings of the summary give an overall sense of what is currently known about the extent of plant-parasitic nematodes affecting corn production in Iowa.

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A 10-Year Summary of Testing for Nematodes that Feed on Corn in Iowa

By Greg Tylka, Department of Plant Pathology and Microbiology

The Iowa State University (ISU) Plant and Insect Diagnostic Clinic is the only facility in Iowa that extracts and identifies plant-parasitic nematodes from soil and root samples submitted by farmers and those who advise them. The results of testing for nematodes that feed on corn in Iowa from 2000 to 2010 were summarized and published in an article this week titled "Testing for Plant-parasitic Nematodes that Feed on Corn in Iowa 2000-2010," by G.L. Tylka, A.J. Sisson, L.C. Jesse, J. Kennicker, and C.C. Marett in the online journal [Plant Health Progress](#).

The main findings of the summary give an overall sense of what is currently known about the extent of plant-parasitic nematodes affecting corn production in Iowa.

Sample numbers

- From 2000 through 2010, the ISU Plant and Insect Diagnostic Clinic analyzed 331 samples associated with corn for plant-parasitic nematodes.
- Soil cores and root samples are needed to thoroughly test for all possible nematode species that feed on corn. From 2000 through 2010, 124 samples had soil alone, 17 samples only had roots, and 190 samples had both soil cores and root samples.
- On average, only 15 samples were submitted annually for testing for nematodes on corn from 2000 through 2004. Annual sample numbers increased threefold beginning in 2005, but still averaged less than 50 per year through 2010.
- Samples were received from only 53 of the 99 Iowa counties, mostly from northern, central and eastern Iowa (Figure 1).

Nematodes found

- One or more species of plant-parasitic nematodes that feed on corn were found in 92 percent of the samples analyzed from 2000-2010.
- The nematodes most frequently found were spiral (present in 77 percent of samples submitted) and root-lesion nematodes (found in 51 percent of samples submitted).
- Most species of plant-parasitic nematodes cause damage to corn only when numbers exceed a damage threshold. Overall, 15 percent of the samples from 2000 through 2010 had nematodes present in numbers exceeding the damage threshold.
- No sample had more than one nematode species present at damaging levels.
- The nematode most commonly found at damaging levels was the needle nematode (eight percent of all samples submitted). Almost all of the samples with needle nematode were from Muscatine County (Figure 2).
- The dagger nematode was second most frequently present at

damaging population densities (six percent of all samples submitted).

- Although spiral nematode was found in 243 of the 331 samples, only one percent of the samples had numbers exceeding the damage threshold.

Implications of the results

It was not surprising that most samples contained one or more species of nematodes that feed on corn. Most of these nematodes are likely native to Iowa and fed upon native plants before corn was cultivated as a crop. The nematodes are not specific to corn. They are very commonly found at low population densities not thought to be damaging to corn.

The high concentration of damaging populations of needle nematodes in Muscatine County is likely because needle nematode is damaging at very low population densities (basically at the detection level of one worm per 100 cc soil) and because of the high prevalence of sandy soils in that area of Iowa. (Needle nematode occurs only in soils with at least 49 percent sand).

One should not extrapolate the summarized results to counties from which no nematode samples were submitted for testing.

The total number of samples tested for plant-parasitic nematodes that feed on corn from 2000 to 2010 was extremely low considering there are more than 13 million acres of corn grown in the state. There were 77 samples submitted to the ISU Plant and Insect Diagnostic Clinic in 2011 for nematodes that feed on corn.

It is not likely that healthy-looking corn is being damaged by plant-parasitic nematodes. So, not every field in the state needs to be sampled for nematodes that feed on corn. But significantly more cornfields showing symptoms of stress should be checked for plant-parasitic nematodes. The ideal sampling times and methods for nematodes that feed on corn were discussed in an [earlier article in ICM News](#).

Increased sampling for nematodes that feed on corn will lead to a better understanding of the importance of these native nematode pests in corn production in Iowa. And information from such samples will allow farmers and those who advise them make more informed decisions concerning the use of current and future nematode management products.

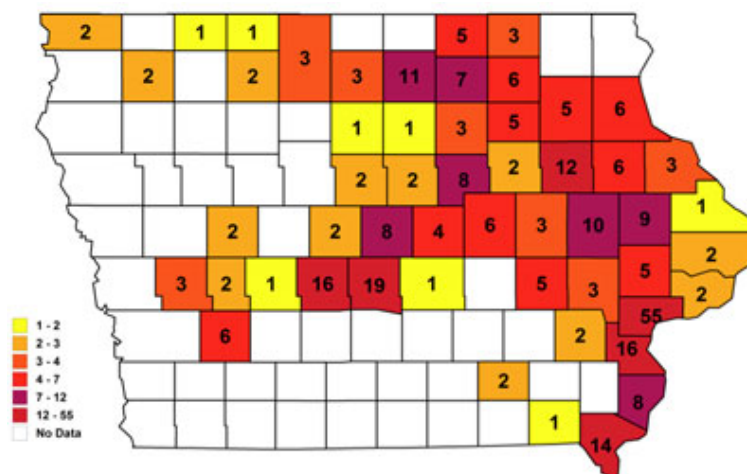


Figure 1. Number of samples submitted to the ISU Plant and Insect Diagnostic Clinic from corn fields to be tested for plant-parasitic nematodes from 2000 to 2010, by county. From Tylka et al. 2011. *Testing for Plant-parasitic Nematodes that Feed on Corn in Iowa 2000-2010. Plant Health Progress* doi:10.1094/PHP-2011-1205-01-RS.

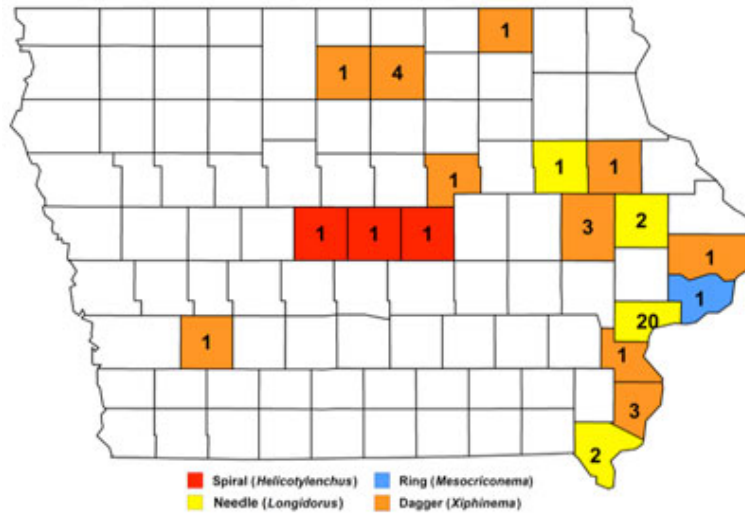


Figure 2. Number of damaging population densities of plant-parasitic nematodes on corn from samples submitted to the ISU Plant and Insect Diagnostic Clinic from 2000 to 2010, by county. From Tylka et al. 2011. *Testing for Plant-parasitic Nematodes that Feed on Corn in Iowa 2000-2010. Plant Health Progress doi:10.1094/PHP-2011-1205-01-RS.*

Greg Tylka is a professor of plant pathology with extension and research responsibilities in management of plant-parasitic nematodes.

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