

INTEGRATED CROP MANAGEMENT

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Plant Diseases

Look out for an early season corn nematode problem

by Greg Tylka, Department of Plant Pathology

Generally, plant-parasitic nematodes are discussed as a problem on corn in July and August because that usually is the time when their damage becomes apparent and also when soil samples should be collected for diagnosis. But there is an exception to this generalization—the needle nematode.

The needle nematode has been found in several fields in southeastern Iowa in past growing seasons, and this nematode is unusual in many regards. The needle nematode is one of the largest plant-parasitic nematodes, reaching lengths of $\frac{1}{4}$ inch. Because of its large size, the needle nematode only occurs in sandy soils, presumably because it needs large pore spaces to move throughout the soil. The needle nematode also is very damaging. While most plant-parasitic nematodes must reach population densities of hundreds or thousands per 100 cc of soil to cause noticeable damage on corn, the needle nematode causes significant damage to corn when just 1 nematode is present per 100 cc of soil. Another unique aspect of the needle nematode is that it migrates down into the soil profile as the growing season progresses, presumably to avoid the summer heat, and then migrates back up in the soil profile near the end of the season. This behavior means that needle nematodes are more likely to be found in soil samples collected in the beginning and end of the growing seasons than during midseason, when soil sampling for most other corn nematodes is recommended.



Needle nematode damage to corn seedlings.
(Tom Hillyer)

Only fields with sandy soils need to be checked for the presence of needle nematode, and probably only if noticeable damage (stunting and yellowing) occurs on corn seedlings. To check for needle nematodes on plants showing symptoms early in the growing season (May and June), collect 15 to 20 12- to 18-inch-deep soil cores from underneath affected plants. Combine the soil cores

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and mix them well before filling a soil sample bag with at least one cup of soil. Soil samples for analysis of needle nematodes can be sent to private laboratories in Iowa and surrounding states or sent to the ISU Plant Disease Clinic, 323 Bessey Hall, Iowa State University, Ames, IA 50011. If samples are sent to ISU, the test for needle nematode (and all other corn nematodes) is called a complete nematode count. Samples should be accompanied by a completed Plant Nematode Sample Submission Form (ISU Extension publication PD-32) and a check for the \$30 per sample processing fee (\$60 per sample for out-of-state samples).

A few nematode species that damage corn (but not needle nematode) spend much or all of their life within the corn roots, and these nematodes develop to damaging population densities during the middle of the growing season. So if damage to corn is observed during July and August, a root sample should be submitted along with the soil sample for testing in order to check for other plant-parasitic nematodes known to damage corn. Collect fibrous roots from 3 to 5 damaged plants. There is no additional charge from the ISU Plant Disease Clinic for including roots with soil as part of the complete nematode count.

Other than irrigation, there is nothing that can be done to manage the damage caused by needle nematode on corn during the growing season in which the nematode is discovered. Management tactics must be implemented in subsequent growing seasons. At this time, there are no nematode-resistant corn hybrids available for management of plant-parasitic nematodes. But two management options exist. The needle nematode is not able to feed on soybeans or alfalfa, and, consequently, population densities of needle nematode will decrease during the season in which these nonhost crops are grown. During years that nonhost crops are grown, control of grassy weeds is important as these weeds could serve as hosts for the needle nematode, negating the effect of growing the nonhost crop. Soil-applied nematicides are available for management of the needle nematodes. Agricultural chemical dealers will have information on what products currently are available for this purpose, the costs of these products, and restrictions on their use.

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

General tips for submitting plant samples* to the Plant Disease Clinic

- Provide plenty of plant material. When possible send the entire plant, including roots and top growth.

- Provide lots of information, such as a description of the soil, nearby plants, cropping history, pattern of symptoms in the field, and a history of the problem. Remember to include information about chemicals used.

- Include photos when possible.

- Provide freshly collected specimens.

- Be sure the specimen represents the problem.



Corn smut galls on corn.
(Paula Flynn)

- Include enough plant material to show all stages of the disease from healthy to very sick.

- Wrap specimens in paper towels or clean newspapers. Do not add moisture. Pack loosely in a plastic bag to reduce drying. Mail in a sturdy container.

- A \$10 fee is charged for plant samples. Soil samples (to check for soybean cyst nematode) cost \$15 for Iowa residents and \$20 for out-of-state residents. Checks should be made payable to Iowa State University.

- Please submit samples with the appropriate forms:
<http://www.extension.iastate.edu/Publications/PD31.pdf>
(plant samples)

- <http://www.extension.iastate.edu/Publications/PD32.pdf>
(soil samples for soybean cyst nematode)

*When herbicide injury is suspected, the samples should go to the extension weed specialists:

www.extension.iastate.edu/Publications/AG146.pdf.

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