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Nematodes can cause poor corn growth

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Nematodes can cause poor corn growth

Abstract

The wet spring and variable growing conditions this year have resulted in many uneven corn stands. These problems often can be attributed to poor root development, fungal root infection, or occasionally, moisture stress. But every summer there are instances of unthrifty corn growth throughout Iowa with no apparent cause. A possible explanation for the poor corn growth that probably is not considered very often is damage due to plant-parasitic nematodes. There are many species of nematodes that can damage corn.

Keywords

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Disciplines

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INTEGRATED CROP MANAGEMENT

Nematodes can cause poor corn growth

The wet spring and variable growing conditions this year have resulted in many uneven corn stands. These problems often can be attributed to poor root development, fungal root infection, or occasionally, moisture stress. But every summer there are instances of unthrifty corn growth throughout Iowa with no apparent cause. A possible explanation for the poor corn growth that probably is not considered very often is damage due to plant-parasitic nematodes. There are many species of nematodes that can damage corn. Dagger and spiral nematodes are the most common and widespread nematodes feeding on corn in Iowa. Needle nematode probably is the most damaging but is not widespread throughout the state. The most important species parasitizing corn in Iowa probably is the lesion nematode.



Nematode damage to corn roots may look similar to herbicide damage.

[Enlarge](#) [1]

In general, damage to corn from plant-parasitic nematodes results in poor or uneven stands if high nematode densities occur early in the season. Symptoms also include yellowing or chlorosis of foliage, unevenness in the height of the corn plants, and small or poorly filled ears during mid to late season. The symptoms and damage caused by plant-parasitic nematodes can occur in distinct patches or "hot spots" that often elongate in cornfields in the direction of tillage operations. Damaged corn roots are stunted, discolored, swollen, and lack fine roots, and they may have dark brown or black necrotic lesions. Other factors also can cause these types of aboveground and belowground symptoms, so nematode damage can be easily misdiagnosed.

How can you diagnose whether a nematode problem exists? Collection of an accurate soil and root sample is the only way to effectively diagnose most plant-parasitic nematode infestations on corn. Collect a soil core or small shovel-full of soil from the upper foot of the soil profile from 10 or more places within an area suspected of being damaged by nematodes. Additionally, be sure to include numerous fibrous roots from plants suspected of being damaged. Many of the nematodes that damage corn spend much or all of their life within the corn root tissue, thus the roots must be assayed for the presence of damaging nematodes. A companion sample collected from a comparably sized area of plants that are not showing symptoms often is useful for comparison purposes. Soil and roots should be placed in a moisture-proof bag and submitted for processing as soon as possible. Be sure to keep the samples cool until they are sent for processing and avoid sending samples late in the week to prevent improper storage over the weekend. Iowa State University Extension

publication IPM 53s, Scouting for Corn Nematodes [2], illustrates the proper procedures to use for scouting for these pests. Soil samples for analysis of corn nematodes can be sent to several 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 corn nematodes is called a complete nematode count. Samples should be accompanied by a completed Plant Nematode Sample Submission Form [3] (ISU Extension publication PD 32) and a check for the \$15 per sample processing fee.

Typically, results from analysis of soil samples include the scientific and common names of the plant-parasitic nematodes found in the sample, the numbers of nematodes present, whether the detected numbers of nematodes are thought to be capable of causing damage, and some management recommendations. Nematodes can feed on corn without causing appreciable yield loss if nematode numbers are low or the corn crop is not stressed by environmental conditions. Much is still unknown about the nematode population densities needed to cause damage to the many different corn hybrids grown throughout Iowa and about the environmental and host factors involved in the buildup of nematode densities.

Management options for control of nematodes on corn are limited. Many effective nematicides have been removed from the market and very few new nematicides are being developed, but a few compounds (including some soil insecticides) are still labeled for control of plant-parasitic nematodes on field corn. Cultural control strategies such as crop rotation, delayed planting, and alternative tillage have little effect on nematode densities in corn, and nematode-resistant corn hybrids are lacking. For more information about plant-parasitic nematodes that affect corn in Iowa, see ISU Extension publication PM 1027, Nematodes That Attack Corn in Iowa [4].

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<http://www.ipm.iastate.edu/ipm/icm//ipm/icm/2001/8-20-2001/nematodes.html>

Links:

[1] <http://www.ent.iastate.edu/imagegal/plantpath/corn/nematode/cornrootnematode.html>

[2] <http://www.extension.iastate.edu/Publications/IPM53S.pdf>

[3] <http://www.extension.iastate.edu/Publications/PD32.pdf>

[4] <http://www.extension.iastate.edu/Publications/PM1027.pdf>

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