

Nematode Management in Corn

Nematodes are microscopic, worm-like soil organisms. Certain species can be detrimental to the growth and development of corn as well as other crops. While nematodes have typically been of minor importance, they have received more attention in recent years. In the past, insecticides have provided control of key corn pests. Nematodes are now being viewed as a more important yield limiting factor in corn production.

The presence of certain nematode species varies according to environmental conditions, soil types and actively growing plants. Nematodes can cause damage by feeding on corn roots. Nematodes feeding on root cells reduce the plants ability to uptake water and nutrients. Damage caused by root feeding can further injure a plant by allowing fungal and bacterial pathogens to enter into the plant. Nematodes are also known to transmit viruses to the plants they feed on.



Testing for Nematodes

To confirm the presence of nematodes, soil and root samples must be taken and submitted to a nematode testing facility. Treatment recommendations can be made after test results confirm nematode species and approximate population density. Refer to university recommendations for treatment thresholds.

Nematode Sampling

Nematode distribution can be very irregular within a field, therefore it is important to collect several composite samples to provide an accurate population estimate. When testing a field with no symptoms of nematode damage only a general field survey is needed to determine nematode species and population. This can help assess risk levels and minimize future nematode problems.

Symptoms of Nematode Damage

Symptoms of nematode feeding are most noticeable when environmental conditions cause plant stress. Common above-ground symptoms include wilting, yellowing, and stunting of growth. Common below-ground symptoms include swollen roots, lack of fine roots, minimal root branching, and necrotic lesions. Nematode damage is rarely uniform within a field, and damage is typically more visible in areas with sandier soils.

In many regions, nematodes are perceived as an increasing problem among corn producers. Current trends in corn production may be contributing to higher nematode populations. Some of these agronomic practices include continuous corn, reduced tillage, and less use of soil-applied insecticides.

If nematodes are a current problem or a suspected problem, a definitive sampling procedure should be used. Samples should be collected around the edges of symptomatic areas and some samples should include roots of the crop. Sampling should occur while the crop is growing and when soils are not overly wet or dry. In corn, samples should ideally be taken prior to tassel. When shipping overnight samples, handle with care to avoid killing nematodes before they reach the lab. A good sample will provide a reliable diagnosis and management strategy.

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Control Options

Because there are many nematode species, identification is essential for determining the appropriate control option. For certain nematode populations the best management practice is crop rotation. Other control options are centered on reducing crop stress. The following agronomic practices may help growers manage potential nematode infestations.

1. Fertilize according to soil test recommendations. Healthy plants are less susceptible to nematode damage.
2. Maintain good weed control. Weeds can be hosts for nematodes and may serve as a food source for the next year's crop.
3. Roots protected from corn rootworm are more vigorous and healthy, and may be less prone to nematode damage. Use the most advanced traits for root protection.
4. For certain nematode species, rotating to a non-host crop can reduce populations.
5. PONCHO® VOTiVO™ is a novel seed treatment product that introduces a new way to protect corn seedlings and roots against nematodes. It contains a bacteria that lives and grows with young corn roots, creating a living barrier that nematodes cannot break through. PONCHO® VOTiVO™ can be used with the Acceleron® corn seed treatment products.



Figure 2. Corn plants pulled from the same field. Nematode damage is rarely uniform.
J. Bond, Southern Illinois University.

Nematode treatments have been found to provide an inconsistent return on investment. This may be due to the fact that nematode damage often shows up as pockets within a field and injury varies with environmental conditions.

Nematode Control Research and Development

Seed treatments may be a good option for nematode control due to ease of application, compatibility with other insect-controlling seed treatments and traits, and ability to target specific areas of a field. Monsanto continues to test and evaluate seed treatment nematicide options that will provide producers a level of protection again these organisms.

Sources: Niblack, T. 2010. Time to Plan for Corn Nematode Sampling. The Bulletin. University of Illinois. No. 4 Article 6. 29 April 2010
<http://ipm.illinois.edu/>

Tylka, G. 2007. Nematodes in Corn Production: A Growing Problem? Integrated Crop Management. Iowa State University Extension.12 February 2007.

Photos: Bond, J. SIU Soybean Pathology. Southern Illinois University. <http://www.scnresearch.info/>

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

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