PURDUE UNIVERSITY
Extension
ENTOMOLOGY

E-215-W

Field Crops

Department of Entomology

NEEDLE NEMATODE

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Needle nematode has become a severe problem with corn grown on sandy ground, especially when experiencing low temperatures and high moisture early in the spring. As more corn planted on sandy soils is irrigated, the striking damage to corn by this nematode species is more frequently observed. This problem has arisen because of an increase in both the ability to apply irrigation water and a desire to continue planting corn in sandy, well drained fields.

Symptoms of damage by needle nematode include patches of yellowed and stunted corn seedlings early in the growing season. Feeding by the nematode causes root growth to be thickened and stubby with short, stiff root hairs that resemble herbicide injury. The damage is generally most severe in areas of the field with highest moisture and sandy soil. Above the soil, the yellowed plants show appearance of nutrient deficiencies.

BIOLOGY AND LIFE CYCLE

Needle nematode is relatively large, up to 1/4 inch in length. However, because it is transparent it can be observed only under a microscope. The needle nematode requires sandy soil in order to move around to find plant roots upon which to feed. We do not know all the details of its life cycle. However, if soil temperatures are cool and soil moisture levels high after corn seed has germinated and plants are 1-2 inches tall, needle nematodes congregate around, and vigorously attack, tender seedling roots. Feeding by this plant parasitic nematode causes stunting and yellowing of small corn plants. Later in the season, soil temperatures rise and the surface soil dries out. Hot, dry conditions cause needle nematodes to stop feeding and move down into the lower depths of the soil profile. When this happens, most corn plants appear to recover and resume more normal, growth. However, this early season stunting causes a yield reduction that cannot be reversed.

SAMPLING FOR NEEDLE NEMATODE

The most accurate way to diagnose presence of needle nematode is through soil and roots, sampling in early spring, about one month after germination. A proper soil sample consists of at least one quart of soil taken directly from the root zone of several affected corn plants, about 4-6 inches deep. Dig stunted plants and place adhering soil and roots in a plastic bag. Attach a label to the outside of the bag. On the label, give sufficient information to identify the sample. In an accompanying letter, give the location of the field, past cropping history, and your name and complete address. Samples should be protected from extreme heat and submitted to the nematology laboratory for processing as soon as possible. Recovery of these nematodes is not possible from dried soil or soil exposed to extreme heat. Send, or bring, the samples to the Nematology Laboratory, Department of Entomology, 901 West State Street, Purdue University, West Lafayette, IN 47907-2089. Visit our website for the latest information: <https://extension.entm.purdue.edu/nematology/services.html>.

Because needle nematodes are attracted to corn roots, few nematodes are found in the area between rows. Thus it is important to take soil from around the roots of stunted, yellowed plants. Since needle nematode feeding activity stops and the nematodes rapidly disappear as the soil surface becomes hot and dry, we frequently cannot find specimens of this species in samples collected after the late June. Needle nematodes often cause severe injury and then disappear from the upper soil surface, as soil conditions become unfavorable for their survival.

CONTROL

The best control for needle nematodes is rotation. A leguminous crop, such as soybeans or alfalfa, should be grown for at least one season to reduce the population of needle nematode sufficiently to allow normal growth of corn the following year. It is important that the rotation crop be grass free, or else the nematode will have a host on which to maintain itself and the rotation will not be effective. Wheat, oats, Sudan grass, and other monocots are potential hosts of this species and should not be considered for rotation.

READ AND FOLLOW ALL LABEL INSTRUCTIONS. THIS INCLUDES DIRECTIONS FOR USE, PRECAUTIONARY STATEMENTS (HAZARDS TO HUMANS, DOMESTIC ANIMALS, AND ENDANGERED SPECIES), ENVIRONMENTAL HAZARDS, RATES OF APPLICATION, NUMBER OF APPLICATIONS, REENTRY INTERVALS, HARVEST RESTRICTIONS, STORAGE AND DISPOSAL, AND ANY SPECIFIC WARNINGS AND/OR PRECAUTIONS FOR SAFE HANDLING OF THE PESTICIDE.

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