

Turfgrass Nematode Problems: Diagnosis and Control

By DR. G. W. BIRD*

PLANT PARASITIC nematodes are microscopic worms that usually feed on the roots of plants. In Michigan, they can be severe pests of turfgrasses.

Above-ground symptoms of nematode-infested turf include yellowing of leaves, dieback and breakdown of young foliage and a tendency to wilt during periods of high temperature and low moisture. Grass cover generally becomes thin and growth during the summer months is poor. Severely affected areas may become bare and infested by annual grasses and weeds. In addition to causing direct damage to root systems, feeding by some plant parasitic nematodes increases susceptibility of certain turfgrasses to diseases caused by other organisms.

Some nematodes live and feed within the roots of turfgrasses. Others live in the soil and feed on the root surface. Both types migrate through the soil from root to root and can be moved even longer distances in sod, irrigation water or in soil on mechanical equipment.

Stunt, stubby-root, root-knot and cyst nematodes are the four most important nematode pests in Michigan turfgrasses. High population densities of the stunt nematode appear to be very commonly associated with Michigan turfgrasses. Spiral, ring and sheath nematodes are also frequently recovered in high numbers from Michigan turfgrasses; however, their overall influence on plant growth and development is unknown.

In Michigan, typical symptoms of Fusarium blight of Merion Kentucky bluegrass usually occur only

in the presence of both stunt nematodes and the fungus *Fusarium roseum*. The stunt nematode renders this grass susceptible to the fungus and appears to be the dominant causal agent in this disease complex.

Nematode Detection

Because nematodes are microscopic and the damage they cause is very similar to that resulting from other factors, a laboratory analysis of soil and root tissue is usually necessary for diagnosis of plant-parasitic nematode problems. In Michigan, this service is provided by the Michigan State University Nematode Diagnostic Service Laboratory, which is operated under the direction of the Michigan Cooperative Extension Service.

Turf samples should be taken with a soil sampling tube, trowel or narrow-bladed shovel. The soil should be taken at a one- to five-inch depth, and contain as many feeder roots as possible. Each sample should consist of a pint to a quart of soil taken from a larger sample composed of 10 or more subsamples. The number of subsamples (soil cores or borings) needed depends on the size of the area being investigated. The subsamples should be mixed in a clean pail or a plastic bag and one pint to a quart submitted for nematode analysis.

Plant parasitic nematodes feed only on living tissues and are rarely found in dead roots. Soil and root samples, therefore, should be taken from the margin of the problem area where the turfgrass is still living.

Sod farm acreage should be sampled for nematodes before seeding. Pre-plant nematode samples should also be submitted where high quality turfs or lawns are desired.

Additional information about diagnosis and control of nematode problems of turfgrass can be ob-

tained by requesting Michigan State's Cooperative Extension Service Bulletin E-800, "Nematode Detection," and E-701, "The Hidden Enemy: Nematodes and Their Control," Michigan State University Bulletin Office, P.O. Box 231, East Lansing, Mich. 48824.

(Editor's note: Residents of other states should contact their local county extension agent or their state's land grant university for information concerning diagnosis and sampling procedures.)

Sod Farm Control

Sod farm acreage should be sampled for nematodes before seeding. In the production of sod, commercial turfs and private lawns, it is much easier to prevent the occurrence of nematode problems than to alleviate them once present.

Pre-seeding treatment — If a site is infested with a detrimental plant parasitic nematode, pre-seeding treatment with an appropriate soil fumigant or nematicide is frequently recommended. This type of nematode control is generally more satisfactory than treatment at or after seeding. Pre-plant soil fumigants such as DBCP, 1,3-D or 1,3-D plus chloropicrin are all suitable for nematode control. The amount of chemical required in organic soil is usually approximately twice that needed for mineral soil. Soil fumigants should be injected into the soil and applied at least 21 days before planting. The soil temperatures should be between 50 and 80 degrees F. Prior to seeding, the soil must be worked to release the fumigant.

Treatment of established sod — DBCP is the only soil fumigant that can be used for nematode control in established sod. To insure good penetration of the chemical, it must be applied as a drench.

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The granular nematicides Fensulfothion and Phenamophos can be used to control nematodes in established sod. They must be uniformly distributed over the area to be treated and drenched immediately after application. The sod should not be harvested for at least 60 days after application. Fensulfothion and Phenamophos are for professional application only.

Commercial Turf Control

Sites to be used for the establishment of high quality commercial turfs should be sampled for nematodes before seeding or sodding. If sod is to be used, it is best to obtain a high quality product grown in nematode-free, nematicide-treated or fumigated soil. This precaution, however, will be of little value unless the soil where the sod is to be used is nematode-free, nematicide-treated or fumigated.

Pre-plant treatment — If a site is infested with a detrimental plant parasitic nematode, pre-plant treatment with an appropriate soil fumigant or nematicide is frequently recommended. This type of control is generally more satisfactory than treatment at or after seeding or sodding. The same pre-plant soil fumigants recommended for pre-seeding sod farm nematode control — DBCP, 1,3-D or 1,3-D plus chloropicrin — are all suitable for nematode control in future commercial turf sites. Treatment is the same as described previously under the sod farm control heading.

Treatment of established commercial turfs — DBCP is also the only soil fumigant that can be used for nematode control in established commercial turfs. It must be applied to commercial turfs as a drench, as in the treatment of established sod. The granular nematicides Fensulfothion and Phenamophos can also be used to control nematodes in many established commercial turfs. They are for professional application only, and may not be suitable for use in certain situations. These materials must be uniformly distributed over the turf and drenched immediately after application.

Home Lawn Control

Sites to be used for the establishment of high quality home lawns should be sampled for nematodes

before seeding or sodding. If sod is to be used, again it is best to obtain a high quality product grown in nematode-free, nematicide-treated or fumigated soil, providing the soil where the sod is to be used is nematode-free, nematicide-treated or fumigated.

Pre-plant treatment — If a site is infested with a detrimental plant parasitic nematode, preplant treatment with an appropriate soil fumi-

gant is frequently recommended. This type of control is generally more satisfactory than treatment at or after seeding or sodding.

Treatment of established home lawns — DBCP is the only compound recommended for nematode control in established home lawns. It must be applied by a professional applicator, and to insure good chemical penetration, it should be used as a drench. □

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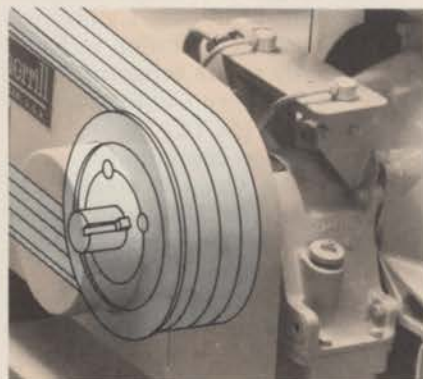
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