DIAGNOSIS OF NEMATODE PROBLEMS OF TURFGRASS

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Plant parasitic nematodes can be severe pests of turfgrasses. Aboveground symptoms of nematode-infected 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 in turn infested by annual grasses and weeds. In addition to causing direct damage to root systems, feeding by some plant parasitic nematodes increase susceptibility of certain turfgrasses to diseases caused by other organisms.

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. Soil and root samples can be taken, submitted and reliably processed whenever the soil is not frozen. For the best possible results, however, samples should not be taken until 60 days after the initiation of annual root growth and not after the first frost.

Turf samples should be taken with a soil sampling tube, trowel, or narrow-bladed shovel. The soil should be taken at a 1 to 5-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.

1. Small area (less than 5,000 sq. ft.), take at least 10 subsamples.
2. Medium area (5,000 sq. ft. to 1 acre), take at least 25 subsamples.
3. Large area (1 to 5 acres), take at least 50 subsamples. No one sample should represent more than 5 acres, and each sample should be from an area of a uniform soil type.

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.

Either the special nematode sample container provided by the Extension Service or a plastic bag can be used for nematode samples. All samples should be placed in plastic bags as soon as possible. Nematodes will be killed if the sample is allowed to dry, and it is important that nematodes are living when the sample arrives at the laboratory.

Soil and root samples should be regarded as perishable, handled accordingly, and processed as quickly as possible. Ideally, they should be stored at 10-15°C (50-58°F). Samples should not be exposed to direct sunlight or stored in trunks of automobiles. Temperatures greater than 40°C (100°F) will kill nematodes.

All samples must be submitted through the local extension office, accompanied by a completed form. The information requested on the form is essential for diagnosis of nematode problems and proper recommendations for nematode population management. It generally takes two weeks from the time a sample is taken until the results are returned to the grower by the local extension agent. The rapid root and soil assays used for mineral soils, however, are not always satisfactory for analysis of organic soils. In a few cases, a bioassay that requires a 45-day incubation period is used for analysis of organic soils. When this procedure is recommended, the grower will

be immediately notified of the delay and will receive the results within two months after the sample was taken.

All results and recommendations will be returned to the grower by the local extension agent. The types and numbers of nematodes will be recorded on the assay form, along with an indication of whether or not nematodes are a problem. If nematodes appear to be a problem, a recommendation will be given by referring to a specific recommendation in an appropriate Extension Recommendation Bulletin. The recommendation should be discussed in detail with the local extension agent.

The best way to analyze the success of nematode population management is to submit a post-treatment sample for nematode analysis. These samples should be taken four to six weeks after treatment. Special post-treatment assay forms can be obtained from the local extension office. It is important that the forms be completed so the post-treatment results can be compared with those of the original sample.

Sod farm acreage should be sampled for nematodes before seeding. Preplant nematode samples should also be submitted where high quality turfs or lawns are desired. In the production of sod, commercial turfs or private lawns, it is much easier to prevent the occurrence of nematode problems than to attempt to alleviate them once present.

Additional information about diagnosis of nematode problems of turfgrass can be obtained by requesting M.S.U. Cooperative Extension Service Bulletin E-800, "Nematode Detection", M.S.U. Bulletin Office, P.O. Box 231, East Lansing, MI 48824.