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TURFGRASS RESEARCH REVIEW

NEMATODES: A PROBLEM ON COOL-SEASON GRASSES

Nematode problems associated with cool-season turfgrasses. C.W. Laughlin. 1972. 42d Annual Michigan Turfgrass Conference Proceedings. 1:16-17. (from the Department of Entomology, Michigan State University, East Lansing, Mich. 48823).

This paper summarizes the parasitic nematode survey and chemical control research being conducted in Michigan. Bentgrass and Kentucky bluegrass turfs affected by parasitic nematodes showed the following above ground visual symptoms: (a) varying degrees of chlorosis (yellowing) of the leaves, (b) possible dieback of the young foliage and (c) increased proneness to wilt during periods of heat or moisture stress. An invasion of weedy grasses frequently occurs as the turf becomes progressively weakened and thinned. Investigation of the roots frequently reveals stunting and the presence of root lesions, root knots or excessive root branching.

Observations made on numerous golf courses throughout Michigan revealed that the sheath and ring nematodes frequently occur in high numbers, but their pathogenic potential on the cool-season turfgrasses appears to be much less significant than several other nematodes. The stubby root nematode occurs in substantially lower populations than the two previously mentioned nematodes, but can cause serious turfgrass injury at moderate populations. Stubby root nematode is a very active parasite of young turfgrass roots that causes severe stunting of the root system. Fortunately, they are relatively easy to control compared to most other species.

Two nematodes have recently

been discovered in Michigan. One is the northern grass root knot nematode, which was seriously damaging Toronto creeping bentgrass putting greens in eastern Michigan. This particular nematode was probably introduced from Canada on stolons. The other recently discovered nematode was associated with a seriously thinned Merion Kentucky turfgrass turf in western Michigan. The grass cyst nematode was found to be actively involved in thinning Kentucky bluegrass.

Detailed studies were conducted with the stunt nematode on both Toronto creeping bentgrass and Merion Kentucky bluegrass. The parasitized plants exhibited a suppression of lateral stolon growth, short internodes and increases seed head development. There was a general reduction in both root and shoot growth. The parasitic effects of the nematode were most severe at soil temperatures below 70° F.

Application of a nonfumigant experimental nematicide to areas infected by the above mentioned nematodes resulted in grass with a distinctly darker green color, more vigorous shoot growth and increased turfgrass density. Split applications of the nonfumigant nematicide made in the spring and fall were more effective in suppressing nematode populations than a single application in the spring.

Comments: Nematodes are microscopic animals that live in water and soil. Many nematode species are beneficial because they feed on fungi, bacteria and insects that are potentially damaging to turfgrasses. However, there are a small number of nematodes that can be potentially damaging to turfgrasses due to their parasitic activity. The nematodes are usual-

ly concentrated in the upper six inches of the soil profile, generally in the vicinity of the host root system and underground stems. Lateral movement of nematodes in the soil is limited to less than one foot. Thus, dissemination usually occurs on soil or vegetative plant parts carried on equipment, irrigation water, animals, dust and flood or drainage waters.

The above ground symptoms of parasitic nematode activity, as reported in this article, are usually the result of a restricted, nonfunctioning root system. Visual symptoms of nematode injury are most commonly observed (a) during stress periods such as heat or moisture stress, (b) in association with fungal infections or (c) on turfs maintained at excessively low fertility levels.

It is very difficult to reliably identify a nematode problem based on visual above ground turfgrass symptoms. If the symptoms and associated conditions suggest a nematode problem, it would then be appropriate to have a soil nematode analysis made. This will give an indication of the specific species and numbers of parasitic nematodes present in the root zone. However, one should keep in mind that high populations of certain parasitic nematodes may not necessarily be associated with turfgrass injury. The only way to confirm that this is the case is by the application of a nematicide to control the parasitic nematode population. The final evidence of a nematode problem would be confirmed by enhanced turfgrass growth and appearance on areas treated with the appropriate nematicide.

Nematodes have been recognized as a problem on warm season turfgrasses for a number of years. This is particularly true in Florida. The

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ation is on course. Tell them that there will be times when the fairways will be virtually unplayable except for preferred lies. Unless this is done, the superintendent could be in serious trouble.

Q—*There is high-quality coal under the land around our golf course and strip-mining is contemplated. We read so much about "the ravaged hills," "rape of the land," "erosion and silt-filled streams" that we (and many others) are deeply concerned.*

Should we form a citizens group and lie in front of the giant strippers to prevent the stripping? Is there a way to restore the land so that it is once more beautiful and useful? We need help! (Illinois)

A—I am glad that you (and others) are concerned. Yes, form a citizens group, not to prevent stripping, but to demand that, after removing the coal, the land be roughly leveled, limed, fertilized and seeded to a mixture of sturdy grasses and permanent legumes. When you are successful in withholding coal revenue from the

strippers to enforce proper revegetation your property values could be enhanced rather than depreciated.

This has been done so successfully in Southeastern Ohio that beef, grazed on the proper combination of grasses and legumes, established on land from which coal was strip-mined, topped the Chicago market. Also, beauty was restored, the land is more useful than before, and erosion is ended.

This Q & A is only the "tip of the iceberg." To elaborate full recommendations in this piece is impossible. There is a way! Most popular writers of the day lament the "rape" instead of learning how to correct it and to tell the legislators that it can be done. This writer will accept questions on the subject and they will be answered. □

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"What do you mean the course is too wet for a golf cart?"



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most extensive research on turfgrass nematode problems has been conducted in that state. Unfortunately, potential nematode problems have not been investigated extensively in the past in the cool-humid regions of North America. Recent studies, such as those reported here, indicate that there are situations where nematodes may be causing serious problems on cool-season turfgrasses by restricting turfgrass growth, particularly on putting greens. Thus, the golf course superintendent in those regions should be alert to this potential problem.

Nematicides should not be applied indiscriminately. These materials are extremely toxic not only to nematodes, but to man when applied improperly. The application of a nematicide should only be made after a soil nematode analysis has been made and a nematicide recommendation given by a qualified nematologist. Nematodes can rarely be eradicated. Nematicides provide a temporary reduction in the parasite nematode population. Once chemical nematode control is initiated, it usually should be continued regularly. Thus, the use of nematicides for nematode control should only be utilized where the problem has been identified. □

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