

## NEMATODE PROBLEMS ASSOCIATED WITH COOL-SEASON TURFGRASSES

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Several nematodes are pests of turfgrasses in Michigan. Above-ground symptoms of nematode infected turf include varying degrees of chlorosis (yellowing of leaves), possible dieback and breakdown of young foliage (necrosis), and a tendency to wilt during periods of high temperature and low moisture. Grass in infected areas generally becomes thin and grows poorly during the summer months. Annual grasses and weeds may invade severely affected areas where nematodes have destroyed the desirable turfgrass species.

Nematodes attacking turfgrasses in Michigan are parasites of the root system. Many feed at or near tips of young feeder roots causing a severe stunting of the root system. Stubby root nematodes (Trichodorus spp.) are the major pests which feed in this manner. Stubby root nematodes occur less frequently in turf than other nematode species, but moderate populations can produce significant injury. Fortunately, they are relatively easy to control.

Nematodes feeding on the older roots of turfgrasses include stunt nematodes (Tylenchorhynchus spp.), spiral nematodes (Helicotylenchus spp.), sheath nematodes (Hemicycliophora spp.), ring nematodes (Criconemoides spp.), grass cyst nematodes (Heterodera punctata), and grass root knot nematodes (Meloidogyne nassi).

Tylenchorhynchus dubius was shown to reduce the vegetative growth of both "Toronto" creeping bentgrass and "Merion" Kentucky bluegrass. The severity of damage by this nematode to "Toronto" bentgrass appeared to be temperature dependent. Symptoms of nematode attack were more obvious when the soil temperature was maintained below 70° F. Parasitized plants grown at the lower soil temperatures exhibited a suppression of secondary stolon formation, short internodes and often produced flower heads. This same nematode was shown to reduce both foliar and root weights of inoculated "Merion" Kentucky bluegrass.

The application of non-fumigant experimental nematicides to infested turf resulted in grass with a darker green color and more vigorous foliar growth than untreated areas within the same stand. It appears that a split application of non-fumigant nematicides made in the spring and fall, when they are finally cleared for use on turfgrasses, will do a better job of suppressing nematode populations than a single application in the spring.

Sheath and ring nematodes frequently occur in high numbers in Michigan turfgrasses. Fortunately, their pathogenic potential on cool season turf grasses appears to be much less than that for other nematodes mentioned.

The grass cyst nematode was recently found associated with roots of unthrifty "Merion" bluegrass lawns in western Michigan, and the northern grass root knot nematode was recovered from bentgrass golf greens in eastern Michigan. These nematodes are reported as serious pests on turfgrass in several other states. At the present time it is not known how widespread their distribution is in Michigan.

The investigation of nematode associated problems in cool-season grasses is a rather new area of interest. We feel that closer examination of these microscopic creatures of the soil, may hold the key to understanding several of our important turfgrass problems.