NEMATODE PESTS OF TURF

By Dr. Ann E. MacGuidwin

Nematodes are the most numerous multicellular animals on earth, with densities ranging up to 29.8 million individuals per m^2. Most nematodes feed on bacteria, fungi, or invertebrates; relatively few species are specialized enough to parasitize man, plants or animals. Those that do, however, can cause serious economic loss.

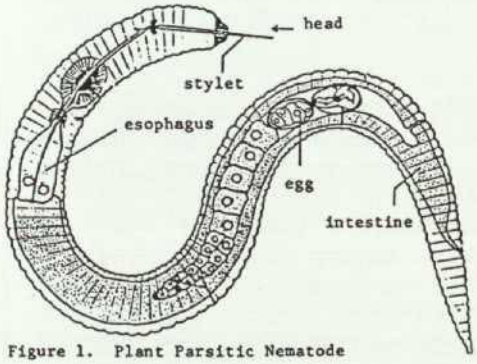

Figure 1. Plant Parsitic Nematode

Plant-parasitic nematodes are microscopic (generally less than 1 mm), colorless roundworms (Figure 1). Nematodes have needle-like mouthparts that are used to withdraw the contents of plant cells. Although most nematodes live below ground and feed on roots, there are several species which parasitize stems, leaves, and even trunks of trees. Soil-inhabiting nematodes are either ectoparasites or endoparasites. Ectoparasites reside in the soil and insert only their mouthparts into roots. Endoparasites enter and inhabit root tissue. Generally, endoparasites are more damaging to plants than are ectoparasites.

Most of the nematode species that attack turfgrasses are ectoparasites. The most common species associated with turf in Wisconsin are: **Tylenchorhynchus** (stunt), **Criconemella** (ring), **Helicotylenchus** (spiral), **Paratrichodorus** (studdy-root), **Xiphinema** (dagger), and **Hoplolaimus** (lance). Three endoparasites have been recovered recently in Wisconsin as well: **Meloidogyne microtyla** (root-knot), **Punctodera** (cyst), and **Pratylenchus** (root-lesion).

The life history of these genera is similar, although they do differ in their mode of reproduction (males are absent in some genera) and habits of egg deposition. The life cycle consists of an egg, four juvenile stages, and an adult stage. The time necessary to complete one generation depends, in part, on soil temperature and moisture conditions. Many nematode genera in Wisconsin only complete one generation each year.

Bentgrass, fescue, **Poa annua**, and Kentucky bluegrass are all excellent hosts for nematodes. Symptoms of nematode damage include: chlorotic foliage, patches of declining growth (especially in hot or dry weather), sparseness of roots, root discoloration, and stubby, galled, or swollen roots. Symptoms generally occur in circular patchy areas rather than uniformly, and may be evident only at certain times during the summer.

In addition to directly causing plant disease, nematodes often act as predisposition agents to increase the incidence and severity of fungal and bacterial diseases. Reports from Michigan indicate that stunt nematodes (**Tylenchorhynchus dubius**) play an important role in Fusarium Blight disease. Work in southern states, however, has not confirmed this nematode-fungus association. It is likely that the epidemiology of Fusarium Blight differs with soil type, climatic conditions, and nematode species, as is the case for other nematode-fungus interactions. Even in situations where a direct interaction is lacking, nematodes are probably important contributors to plant stress, thereby threatening plant health.

The extent of damage to turf from nematode parasitism is directly related to the number of nematodes present. Due to its profuse root system, turf generally supports high levels of many nematode genera with no significant damage. The relationship between nematode levels and turf health, however, is affected by many factors, including the age and nutritional state of the turf and the presence of other disease agents or inspect pests. Management strategies for nematodes should be implemented if population levels are above the damage threshold, and/or if symptoms are present.

Nematicides are relatively effective and the most practical means to reduce nematode populations levels. Granular nematicides registered for turf include Dasanit, Nemacur, Nemacur 3, and Mocap. These materials attack the nervous system of nematodes and cause paralysis, aberrant behavior, or death. Unfortunately, nematicides have much the same effects on humans, so should be used with great caution and regard for safety.

Anyone suspecting a nematode problem may submit soil and root samples to the:

Department of Plant Pathology
1630 Linden Dr.
University of Wisconsin-Madison
Madison, WI 53706
ATTN: Dr. A. MacGuidwin

Cost of the analysis is $20.00 per sample (both root and soil assays included). The samples can be collected anytime and should consist of multiple cores taken from the area showing symptoms (do not sample dead turf). The samples should be kept moist and cool. A description of the site and suspected problem should also be included.

Editor's Note: A native of suburban Detroit, Ann MacGuidwin is the nematologist in the UW Department of Plant Pathology. Dr. MacGuidwin earned her B.S. degree at Michigan State, travelled to Florida and received an M.S. in Nematology at the University of Florida in 1979, and returned to MSU and studied for her Ph.D. in Entomology-Nematology. She graduated in 1983, came to Madison to teach a short course in nematology for five weeks and shortly after that she accepted a position as an Assistant Professor in the Department.