

UNITED STATES GOLF ASSOCIATION

GREEN SECTION

WESTERN OFFICE



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• Western Turfletter •

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W H O K N O W S T H E N E M A T O D E ?

"Nematodes may be numerous in soils, but do they cause any damage?"
-----"Nematodes may cause damage, but are they dangerous to turf?"-----
-----"Nematodes may be dangerous to turf, but who really knows?"-----

Along with the weather, turfmen are making nematodes a good conversation piece. And rightly so, for nematodes present a complex problem with pitifully little information available. Shall we look into the subject?

Many of us will probably never see a nematode and wouldn't recognize one if we did. Although some are visible to the naked eye, most nematodes can be seen only with a microscope. Under the lens, these members of the animal kingdom appear as small, non segmented eel like worms. There is no trick in finding them for they are universally present; in the sea, in fresh water, in the desert, atop the highest mountain, at the bottom of Death Valley, in the arctic and in the tropics. Like a cold, they're hard to avoid.

People have talked about nematodes since biblical times. Wheat fields in England were damaged by them in 1743 and through the 1800's and early 1900's additional nematode danger signals were recorded. It was not until 1951 when Tarjan and Ferguson (USGA Research Co-ordinator) reported nematodes associated with "yellow tuft" disease on bentgrass that turfmen took an interest. Since then, additional turf research work has been undertaken, particularly by Dr. Gene C. Nutter of the University of Florida (now Executive Director of the Golf Course Superintendents; Association of America).

INNOCENT UNTIL PROVEN GUILTY?

One big problem for research workers is to obtain positive proof that nematodes are the cause of trouble in plants exhibiting poor growth. Seldom do they kill the plant they attack and their symptoms of damage are identical to a number of mal practices such as poor irrigation (too wet or too dry), improper fertility levels, any type of root injury, disease, poor soil aeration, etc. Don't allow yourself to be stampeded blindly into trying nematode controls when it is more likely one of the above factors may be the cause of the turf decline. In fact, there seems to be an increasing tendency to blame nematodes for any sudden change in turf conditions. Guard against this thinking on your course.

INNOCENT UNTIL PROVEN GUILTY? (CONT'D)

The mere presence of nematodes, even in large numbers, does not prove they are the cause of turf decline. In fact, many species are actually beneficial to plants while some cause damage to other plants but do not injure turf-grasses. The common names of nematodes believed to be injurious to turf are: Sting, ring, awl, lance, stubby root and stunt. However, there seems to be no published information as to what constitutes a critical nematode population before serious injury results. There are many interrelated factors.

PUZZLING EVIDENCE:

There are many unanswered questions:

- I. A. Workers at the University of Florida noted early summer decline in vigor and general chlorosis to an experimental bermuda green in 1957. Nematode counts were taken. Treatment was made with a chemical nematocide (VC-13) under proper conditions in August.
B. By mid-summer 1958 turf decline and chlorosis was again noted. The green received a treatment with another nematocide (Nemagon), again in August and again under proper conditions.
C. Nematode counts were made three and eight weeks after this treatment. The nematode population on the experimental green showed an overall 200% increase from August 1957 to August 1958!
- II. A. During the same Florida experiment, a study of the effect of various nitrogen sources was also made. The nitrogen sources included ammonium nitrate, activated sewerage sludge and urea-formaldehyde.
B. "In this test, complex interactions became evident between nitrogen source and nematode species. The overall nematode population increase was notably less on the activated sludge plot than on the other nitrogen plots", reports Dr. Nutter. "Perhaps the active sewerage sludge created soil conditions which were more favorable to the development of predators, thereby holding the build-up of parasitic nematodes more in check than in the case of other nitrogen sources."
- III. A. In another nematode study conducted at the Connecticut Experiment Station, Dr. P. M. Miller obtained some interesting results when he tackled a problem of root-knot nematodes and root rots on ornamental plants. Being a practical scientist, he treated one group of plants with a mixture of a nematocide (VC-13) and a fungicide (Nabam) in the hope of controlling both the root-knot nematode and root rot fungus at the same time. In other plots he applied the materials separately and carried control or check plots as well.
B. Nematode control was much greater where both materials were applied! This was unexpected and puzzling. Further investigation also showed a marked nematode increase in the plots where Nabam (the fungicide) alone was used.

PUZZLING EVIDENCE (CONT'D)

C. Why should this be? Why were more nematodes hatched in an area treated with Nabam, a fungicide not known to affect nematodes at all?

D. Following through with his investigation, Dr. Miller found that Nabam increased nematode activity for two reasons. It triggered some mechanism that caused the egg masses of root-knot nematode to break apart. No other chemical is known to act in this manner. Nabam was also found to stimulate emergence of the young larvae of cyst nematodes. ----- Thus, the fungicide Nabam seemed to step up the life cycle of certain nematodes and the nematocide (VC-13) had a better chance to complete the kill.

JURY SUMMATION:

The road to complete understanding and control of nematodes is going to be a difficult one. Our thinking over the years has been geared to expect immediate results from our chemicals: To kill a weed in short order we use 2,4-D; to check Fusarium Patch in a few days we use a mercury compound; to kill grubs we spray with chlordane and so on and so on. We're getting used to the immediate.

We may have to change our thinking for nematodes. Rather than kill our turf outright, they possibly cause their greatest damage by a gradual weakening process; a gradual eating away of turf vigor; a gradual thinning out. Their symptoms look like a hundred others. The study in turf is so new that research workers are only beginning to find the first answers.

But to the professional superintendent, faced with the need of providing quality putting green turf every day, one tool is still available to him ----- GOOD MANAGEMENT. If he will continually maintain good fertility levels, continually watch the water, continually check for disease, correct faulty soils and drainage at every opportunity, check chlorosis, guard against compaction, watch out for tree roots, use the best grass available to him, etc., we believe he will stay ahead of the nematodes, at least for the foreseeable future.

"To give real service you must add something which cannot be bought or measured with money: and that is, sincerity and integrity."

Donald A. Adams

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