David Wolfard, a turf management student at Oklahoma State, conducted the nematode control test. The area above was treated with Dasanit 15G at the rate of three pounds per one thousand square feet. Chart below shows results.

Nematode Control Pays

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NEMATODE damage to turf has been recognized as a problem in many of the northeastern and southern states for several years.

High nematode populations are found in the putting greens of most of our older golf courses in Oklahoma. Sometimes these heavy populations of Stylet, Spiral, or Ring nematodes can be associated with wilt, lack of vigor, off-color, and thinning of the grass.

These symptoms can be confused with poor soil aeration, drought, low fertility, and insects or disease. To convince the superintendent that his problems were caused by a tiny worm-shaped animal feeding on the root system has been difficult, to say the least.

In past years several attempts have been made to demonstrate the effects of controlling nematodes. Soil analyses showed that we were reducing the nematode populations in the various control studies; yet, little difference could be noted in turf density. We could only suggest that the high maintenance program carried out on the courses we were working with may have masked the nematode damage.

In an effort to demonstrate the effect of nematode control on bentgrass putting greens, three greens were selected at the Westwood Park Golf Course in Norman, Oklahoma. The study was carried out by David Wolfard, a turf management student at Oklahoma State University. This course was being maintained under one of the better programs in the state and had what was considered moderate to high populations of Ring *Criconemoides sp.* and Spiral *Helicotylenchus sp.* nematodes.

Dasanit 15G, being the only granular nematicide suggested for use in Oklahoma, was applied at the highest suggested rate at various times during the season to established Penncross greens. Dasanit 15G at three pounds formulation per 1000 square feet was applied April 4 on the south one-half of three greens. A similar rate was applied July 20 on the east one-half of the same greens.

Hence, each green consisted of four treatments: 1. early, April 4; 2. late, July 20; 3. early + late, April 4 and July 20; and 4. no treatment. The product was distributed evenly over the greens in each treatment with a 21 inch Gandy Turf Tender and drenched in with one-half inch of water.

Soil samples were taken during the season for nematode analysis and processed by the Oklahoma State University plant disease diagnostic laboratory.

To determine the effect of nematicide applications, grass clippings were taken late in the season from a 125 square foot area in each treatment. Root depth measurements were made from samples taken at

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Treatment, rate, and Time of Application	Nematode Population Rating[1] Dates Samples Were Taken: April 28	May 16	June 6	June 28	July 19	Aug. 15	Sept. 24	Root Depth[2] in mm	Clipping Wts. in gms[3]
Dasanit 15G 3 lbs/ 1000 ft									
Early (April 4)	1	1	2	2	4	4	4	175	45
Late (July 20)	2	2	5	6	5	5	5	170	57
Early & Late (April 4 & July 20)	1	1	2	2	2	2	2	158	125
No Treatment	4	5	8	8	7	7	9	80	30

[1]Ring and Spiral nematode populations were rated as one unit based on Oklahoma State University diagnostic analysis rating (0—9): 0=None; 1=Trace; 3=Light; 5=Moderate; 7=Heavy; 9=Very Heavy.

[2]Root samples (7"x3"x½") taken near end of season with Noer soil profile sampler.

[3]Grass clippings taken from 125 ft² area, green weight.

NEMATODE CONTROL

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the same time with a Noer soil profile sampler.

The populations of Ring and Spiral nematodes were reduced following each nematicide application. Nematode populations in areas receiving only one application began to increase within six to eight weeks after treatment. In the areas receiving the two applications (early and late), the nematode populations increased slightly following the early application and remained at a low level for the balance of the season.

The populations in the non-treated areas were rated as very moderate during April, increased to heavy in June, July, and August, and increased to very heavy in September.

Roots in all the nematicide-treated areas penetrated 158 to 175 mm (6.2 to 6.9 inches) which was nearly twice the depth of those in non-treatments. Plots receiving the early and late applications produced approximately four times more grass clippings than the non-treated area, twice as much as the late treatment, and three times as much as the early application. The increased grass clippings indicate a more vigorous plant growth, even though this difference was not noticeable from general observation.

It is not difficult for the golf course superintendent to appreciate that the deeper root systems provide a greater ability for the plants to withstand stress periods and recover much quicker under the heavy traffic we have in Oklahoma.

Dasanit 15G has performed well for us, and our superintendents have selected the granular nematicide over the liquid fumigant because it's easier to handle. Many of the superintendents carrying out a nematode program say their greens are improved, yet they fail to understand how a little worm they cannot see could do so much damage. We suggest to our superintendents that if they are following a good maintenance program and are having difficulty maintaining a dense stand of grass, they should pull soil samples and obtain a laboratory nematode and fertility analysis.

Our nematicide trials have shown that applications of soil fumigants Nemagon or Fumazone, or the non-fumigant Dasanit will reduce populations of nematodes to a level that will aid growth of bentgrasses. Using the manufacturers' recommended rate, Nemagon 12.1EC or Fumazone 70E should be applied as a drench, at the rate of one pint with 15 to 20 gallons of water per 1000 sq. ft. **Immediately** following this, the treated area should be given a good irrigation.

When using Dasanit 15G at 1½ to 3 lbs. formulation per 1000 sq. ft., distribute the granular dosage evenly over the turf area. Drench the grass thoroughly after treatment by applying approximately one-half inch of water. Do not treat newly-seeded areas!

Remember that while these materials will reduce the population of nematodes, they do not completely eradicate them from the soil. Therefore, it would be advisable to have your greens checked annually, once nematodes have been found to be a problem.□

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