



## MANAGING NEMATODES

# Without Nemacur

*Nematode damage on a putting green. Photo by Todd Lowe*

*By Joel Jackson, CGCS Retired*

The widely used, industry-standard, chemical nematicide, fenamiphos – distributed by Bayer under the trade name Nemacur – will complete its three-year phase-out May 31. The turf industry will have to manage nematode damage without this product.

Casual and imprudent applications of Nemacur too close to golf-course water bodies did result in a few cases of fish kills and certainly the toxicity level and re-entry restrictions made it a very sensitive product to use. But like most pesticides, it was not a problem when used properly.

Under the Food Quality and Protection Act, the U. S. Environmental Protection Agency was mandated to review all pesticides and recalculate the risk factors. The organophosphate family of chemical which included Nemacur was one of the first on the list, and Nemacur was given the ax.

So what to do next?

Bayer, with the support of the golf industry including the Florida GCSA, was able to negotiate a three-year phase-out in hopes of discovering some alternative products to manage nematode infestations and, more importantly, the damage

that could be caused to intensely managed turfgrass, especially the putting surfaces.

Dr. Billy Crow, nematologist with the University of Florida, was provided a grant from Bayer to study alternative products. The results from his two-year study indicated that an extract of mustard seed oil appeared to be the most effective deterrent, but that product is not available commercially. The other products had varying degrees of success in the test-plot environment.

More recently one compound – sodium azide – that Dr. Crow used in one trial had showed promising results in reducing nematode counts and providing good turf response. Reportedly the byproducts are salt water and some proteins. Commercial availability is years away, so keep looking for other ways to manage nematodes, keeping in mind that turf density and color – not the number of nematodes – are what matter.

Curfew (Telone) is available and provides effective control of nematodes

and mole crickets.

It is slit-injected by licensed applicators. It requires 100-foot setbacks from any structure (residence) and is not allowed in Dade County. There is a 24-hour re-entry restriction. If you have a critical problem that needs quick response and control, Curfew is an option to consider.

According to USGA Agronomist Todd Lowe, nematode populations and damage can be collateral results of shade, compacted soil, poor soil moisture and nutrient levels, so be sure to look for and eliminate the other stresses as well. He also said there are several other products that claim nematode control and many have nutrients involved, so one would expect to get a turf response. We must rely on managing the turf and not just focus on eliminating nematodes. There are no silver bullets, but there is some ammunition to consider.

One product that is readily accessible and has been mentioned most by several superintendents as providing satisfactory results is NeoTec distributed by Parkway Research. During the Nemacur studies by EPA, Parkway scientists claimed that NeoTec was successful in suppressing nematode activity. Superintendent

### Curfew and Turfcure 376

[http://entnemdept.ifas.ufl.edu/Crow\\_NRP\\_16.pdf](http://entnemdept.ifas.ufl.edu/Crow_NRP_16.pdf)

### Biologically derived alternatives to Nemacur

[http://entnemdept.ifas.ufl.edu/Crow\\_NRP\\_03.pdf](http://entnemdept.ifas.ufl.edu/Crow_NRP_03.pdf)

skepticism and desire for university research results kept NeoTec under the radar.

Another factor that kept NeoTec from being heralded as a replacement for Nemacur is the nuanced, variable results from nematode sampling. So many factors – from the actual sampling method, location and timing to the lab handling and mortality from a variety of causes – made consistent verification of results a tough process. Thus the belief and faith that a sesame-seed-oil-extract could effectively control nematodes was never established.

The following accounts are not to be construed as endorsements of NeoTec as the preeminent replacement for Nemacur, but they are anecdotal comments by several superintendents who feel they have been successful in managing and minimizing nematode damage on their courses. Here are their comments on the practices that have given them satisfactory control of nematodes from courses in Central Florida down to Palm Beach County:

Several years ago, after the phase out was announced, Ridge superintendents Alan Puckett (The Club at Eaglebrooke) and Steve Ciardullo (then at Mountain Lake CC), reported satisfactory results using NeoTec in the sandy Ridge area of Florida.

Just recently, in preparation for this article, Central Florida superintendent Chris Cartin reported using NeoTec with success for the past eight years on three different golf courses. Additionally, I stumbled into a discussion among

Boca West superintendents Steve Wright and Darden Nicks and consultant Larry Smith about a NeoTec and Bovamura program at the 54-hole complex in Boca Raton.

At the time (two or three years ago) I did not get hard numbers from Puckett and Ciardullo, but they both claimed that the product did provide relief from nematode damage symptoms and were happy with the results. In the cases of Cartin and Wright I did get more data to share.

When polling others on their plans to manage nematodes, the answer was a quick one – “Stockpile product.” But escalating prices and dwindling inventories of product made that choice unrealistic.

Enter the NeoTec programs.

According to Wright, the label describes NeoTec as containing 50 percent sesame seed oil and 50 percent lecithin. It does not claim to be a pesticide and thus does not have an EPA pesticide label or classification for use. For the sake of this discussion we will consider it to be a soil conditioner.

What it appears to do is to create an environment in the soil that turf-damaging nematodes do not like. Exactly what the mode of action is, I don't know. What I do know from Cartin and Wright is that they appear to be able to manage their nematode populations with the product and that's the bottom line – results.

Cartin has been using the product for the past eight years.

“My program is to apply 83 ounces

per acre to my known problem areas every six weeks. The key is to be aggressive and consistent to get ahead of the populations. Once you reach a comfort zone you can back off applications, depending on time of year and conditions that you monitor.

“We apply the liquid version, NeoTec SL, with a flow jet, and water it in for approximately 5 minutes to get it off the leaf blade. We also use either granular or liquid wetting agents to help it penetrate into the soil where the nematodes are. We start in April and stay pretty diligent throughout the summer and only back off when we feel nematode pressure is off, but you do have to be vigilant on your greens and known hot spots on tees and fairways. We apply some fertilizer to boost the plant health following an application during the growing season.

“Our nematode counts are going down. I believe the product acts as a “sickening” agent that either drives the nematodes out of the treated areas or makes them so weak they can't function enough to cause severe damage. It is safe, so you don't have to worry about health and environmental issues and it's economical. There may be times when you have to tolerate some slight off-color appearance but if you beef up your treatments, they seem to respond very well.”

When Wright took over at Boca West a few years ago, the nematode counts read from 750 to 1140 Lance nematodes and 15-45 Sting nematodes per 100 cc of soil. The older courses had a thick



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organic profile and the roots on the turf were really short. The roots were so weak that initial aerifications were rolling up the sod.

In consultation with agronomist Larry Smith, Wright developed a NeoTec program that has drastically reduced the nematode counts and damage. He says you have to be aggressive and patient.

"We began using NeoTec in the spring of 2003 at a rate of 2 gallons per acre twice a month, and made our last application in September of that year. We saw results and verified declines in the numbers of nematodes.

"On some persistent greens, hot spots and mounded areas, we did resort to limited spot treatment with NemaCur in early 2004. In June 2004, our counts were low but they did spike up a little in August, but we did not apply NemaCur. The following year in 2005 our counts were in the "non-detect" range. We did find that testing can be nebulous and

the best guide is to watch your turf and react to the conditions that you see.

"In 2004 we added 1/3 gallon of Bovamura (5-0-0) per 1,000 sq.ft – or 12 gallons per acre – to our NeoTec applications. While the NeoTec seems to retard the nematode activity, we wanted to stimulate the plant growth and other soil microbes to maximize suppression of nematode activity. As noted, our counts are showing reduced numbers and the results in terms of appearance and performance of the turf have been good.

"I think that managing moisture also has a great deal to do with minimizing nematode damage. It seems when the greens get too dry, the nematode problems can accelerate. We don't want to over-water, but we don't want to get too dry either. So water and feed your grass properly to keep your turf healthy enough to withstand nematodes.

"If you do have a problem that needs addressing, you need to be aggressive

and persistent with the NeoTec. The 2 gallons, twice per month worked for us. As we gained a comfort level we could back off to once per month when turf and stress conditions permitted. I'm happy to say that in a world where minimizing chemical use is becoming an issue, using NeoTec has given us results we can live with."

A few other products out there seem to be working for folks who have been willing to experiment, but they haven't made the headlines. Lowe also has shared that Bob Bittner has had good results using a walnut-extract product at The Club at Pelican Bay.

The key is that several superintendents have taken the steps to wean their courses from NemaCur dependency and are trying various products and programs to simply rather than simply eliminating nematodes.

It takes more diligence and persistence and it's an ongoing process, but it can be done.

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## SUPER TIP

## A Picture is Worth a Thousand Words

By Darren J. Davis

It has been said throughout time that a picture is worth a thousand words. I have used this familiar proverb numerous times in my career as a golf course superintendent, and I believe it often holds true. Over the last year, while attending Everglades Golf Course Superintendents Association board meetings, I noticed that current EGCSA President Bill Davidson printed and pinned two pictures to a bulletin board in his break room. The pictures depicted the correct and incorrect method for edging a golf-course sprinkler head. After looking at these two pictures for a few board meetings, I came to realize that, due to staff turnover or just less-than-perfect mindfulness by my existing staff, I often find myself repeating instructions or retraining crew members on similar basic tasks. I took Davidson's idea and expanded upon it and offer my results as this issue's "Super Tip."

In developing a plan for this picture project I decided that I wanted to continually rotate the subject that was showcased. I also realized that the tasks/items which I would illustrate with photos could be recycled indefinitely. This led me to purchasing two Advantus "Grip-A-Strip Display Rails" at Office Depot. The display rails use a patented roller system to organize items on a wall. They are like a bulletin board but with no tacks and are available in 12-, 24-, 48- and 96-inch models. Depending on the quantity of pictures I wish to display I use either a 24- or 48-inch display rail. The cost of a 24-inch model is \$16.99, and the 48 inch model sells for \$30.99.



*Photos showing proper way to install traffic control ropes and stakes. Photo by Darren Davis.*



*Photo reminders of necessary "detail work" tools to take each day. Photo by Darren Davis.*

When I decide on an item that I wish to convey to my staff, I use my digital camera and gather photos that depict the situation. Sometimes I show a "right" and "wrong" photo or, for some issues, a single picture will suffice.

After downloading the images to my computer, I print them on 8½ by 11, 9 mil HP glossy photo paper. A 100-sheet package sells for \$29.99 at Office Depot.

The next step in the process is to decide on a caption for the printed photos and to translate the word or phrase into Spanish. I print the text on an Avery 8160 (1x 2-5/8-inch) address label and affix it to the photo. A 750 pack of the labels sells for \$11.99.

Finally, since I want to reuse

the photos I insert them into Avery nonstick sheet protectors which are made of polypropylene and sold at Office Depot in packs of 25 for \$5.79.

To date I have used the system to remind the staff of the correct method for installing rope and stakes at Olde Florida, the desired depth on a bunker lip, tee marker placement and alignment, and to prompt staff to make sure certain items ("weed popper," ball mark repair tool, etc.) are in their possession at all times.

As you can imagine I am only limited by my imagination to the number of items that I can depict in photographs for the staff. My total cost was less than \$100, and in my opinion an extremely wise investment of my club's resources.