

Research Highlights Future Nematode Treatments

BY BILLY CROW

Plant-parasitic nematodes are microscopic worms that feed on plants. Most nematodes that damage turfgrasses feed on roots. The majority of golf courses in Florida have problems with one or more species of nematodes. With the phase-out of Nematicur scheduled for 2007, there's a great need to identify new ways to manage nematode problems on golf course turf. At the University of Florida, we are attacking this problem from several angles.



New nematicides: The phaseouts of methyl bromide and organophosphate nematicides (like Nematicur) have opened up markets for new nematode-management products. This has led to several major chemical companies to restart their nematicide programs, as well as some smaller companies starting their own research into new control options. Over the past couple of years, we've evaluated several new active ingredients for activity against turfgrass nematodes in greenhouse and field studies. While it's too early to tell if any of these chemistries will be available for golf course use soon, the fact that effort has shifted in that direction is promising.

New uses for existing nematicides: Finding ways to use existing chemistries on turf is attractive for a couple of reasons. These products have a track record and known efficacy, so there is less risk to the company. It is also cheaper to get a label for an existing chemistry on a new crop than to get a completely new chemistry labeled.

For example, Curfew Soil Fumigant is a new product for golf courses from Dow AgroSciences, but the active ingredient has been used for preplant nematode control on agricultural crops for 50 years. Curfew Soil Fumigant is now labeled for golf course applications in Florida and South Carolina, and labels in other Southeastern states are pending. Currently, Curfew Soil Fumigant can only be used on tees, fairways, driving ranges and roughs. However, putting green applications may be available as soon as next spring.

In our studies, Curfew Soil Fumigant has been the most consistently effective product we have tested against sting nematode, the most destructive turfgrass nematode. It also has

efficacy against mole crickets and possibly some other turfgrass pests. However, Curfew Soil Fumigant's activity against certain other nematodes, such as lance nematode, is not as great.

Biological control: We are working on several strategies in this area. The bacteria *Candidatus Pasteuria usgae* was recently described as a parasite of sting nematodes by Robin Giblin-Davis of the University of Florida. But there are also other species of *Pasteuria* that live off of other turfgrass nematode species. *Candidatus Pasteuria usgae* was shown to suppress sting nematodes in field tests below damaging levels. We are now trying to find practical ways to inoculate this bacteria into noninfested turf and cause nematode suppression on a commercial basis.

In other projects, we're seeing if beneficial nematodes might be used to manage plant-parasitic nematodes on turf in Florida. We are also testing several commercially available bacterial and fungal products to see if they might suppress plant-parasitic nematodes or reduce the impact of nematode damage on turf.

Alternative nematicides: We have tested more than 20 products over the last several years derived from plants and microbial fermentation. While many of these appear to be ineffective, one is really showing some promise. This is a material that is a formulated mustard-bran. As this material decomposes, it releases a nematicidal fumigant that is moved into the soil with irrigation water. Applied as a topical treatment to turf, this mustard-bran product has been shown to reduce populations of several nematode species and to promote healthy turf on a consistent basis. A commercially available mustard-bran product may soon be on the market.

So superintendents of golf courses with nematode problems do not need to enroll in hotel management classes yet. We should have some acceptable alternatives to Nematicur identified within the next four years.

Crow is an extension specialist in landscape nematology at the University of Florida's Nematode Assay Laboratory.