

Research You Can Use

Overseeding and Nematicides Affect Sting Nematodes in Bermudagrass Fairways

Research shows that when it comes to nematodes, timing is everything.

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Sting nematodes injure bermudagrass roots and cause drought-like symptoms to occur.

Nematodes are microscopic, nonsegmented roundworms, with several species being parasitic to turfgrass. Nematodes have become one of the most significant turfgrass pests on Florida golf courses, as there are few chemicals that can effectively control them. The most common nematode that negatively impacts bermudagrass growth on

Florida golf courses is the sting nematode (*Belonolaimus longicaudatus*).¹

Bermudagrass is the dominant turf on Florida golf courses, but it becomes dormant during the primary play season and is often seeded with cool-season grasses to improve winter playability and aesthetics. The cool-season grasses used for overseeding produce a copious amount of new, white roots

that provide food for sting nematodes. Environmental factors that regulate sting nematode populations are soil temperature and food availability, and the increased roots from overseeding may increase nematode populations. There continue to be discussions about the benefits and liabilities of overseeding, particularly regarding bermudagrass health, and a potential negative impact

of overseeding could be higher numbers of sting nematodes over time.

Nemacur (fenamiphos) has been one of the most effective nematicides for controlling nematodes in bermudagrass turf and, in product evaluation trials, few alternatives significantly improved bermudagrass quality.² Curfew™ Soil Fumigant (1,3-dichloropropene) is one of the new nematode management products for use on established golf course turf, having been registered several years ago.³ This nematicide is generally effective at reducing sting nematode populations in the soil and is typically applied in late spring/early summer, when nematodes are actively feeding and causing damage to bermudagrass turf. The benefits of applying Curfew in late summer/early fall are currently unknown, but it may improve turf quality, particularly on nematode-infested bermudagrass that is overseeded for the winter play season.

GOLF COURSE STUDIES

Field trials were conducted on two common bermudagrass fairways at the Palatka Golf Club in Palatka, Florida. The objectives of these trials were to determine the effects of fall applications of Curfew and ryegrass overseeding on numbers of sting nematodes throughout the winter and during spring transition. Overseed treatments consisted of a blend of 40% Jet perennial rye, 40% Applaud perennial rye, and 20% Gulf Annual rye (Kelly Overseed Blend) at 300 lb. per acre and was applied on November 6, 2003. Curfew treatments were applied on October 1 (six weeks before overseeding) and on October 26 (two weeks before overseeding). Non-overseeded and non-treated check plots were also included in the study.

Soil samples for nematode assays were collected before overseeding, eight weeks after overseeding (January 2, 2004), and at the end of overseeding transition (April 29, 2004). At the same time, the turf was evaluated for color (1-9) and density (0-100%). January evaluations gave an indication of the

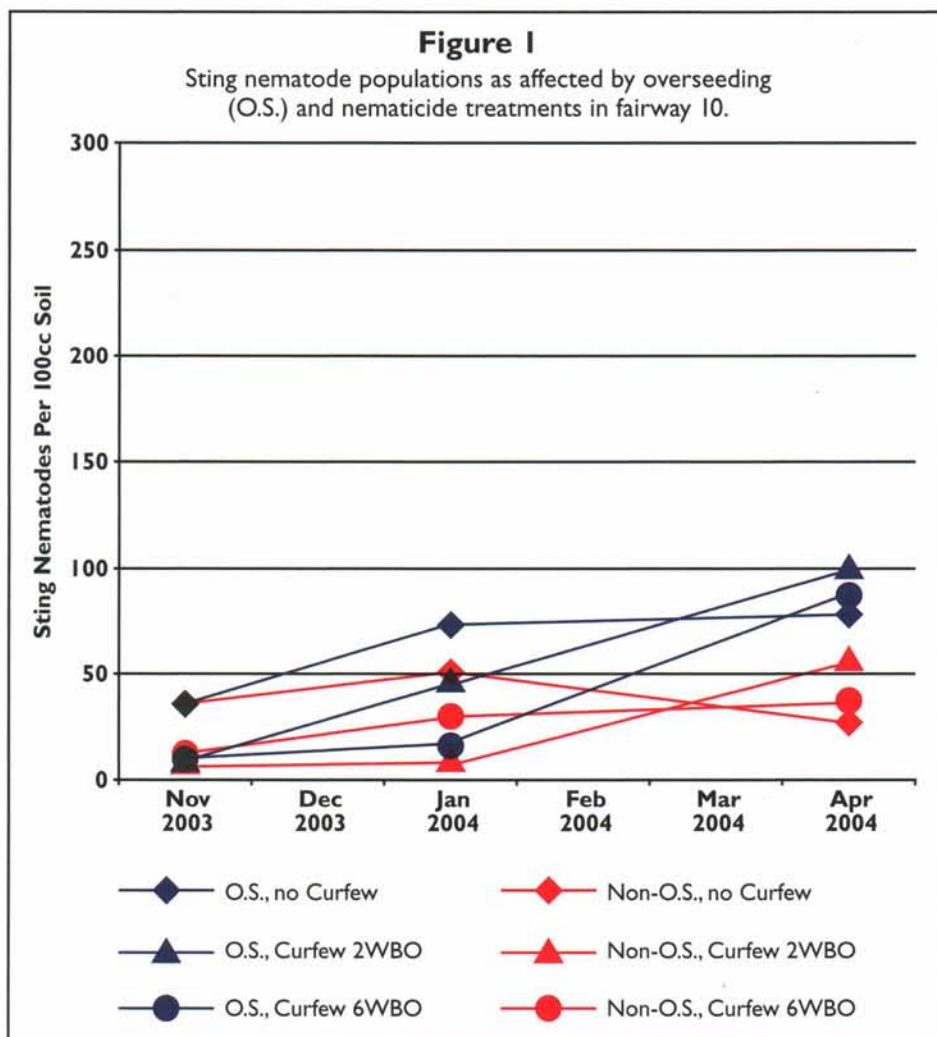
treatment effects on overseed quality, and April evaluations gave indications of treatment effects on the base bermudagrass.

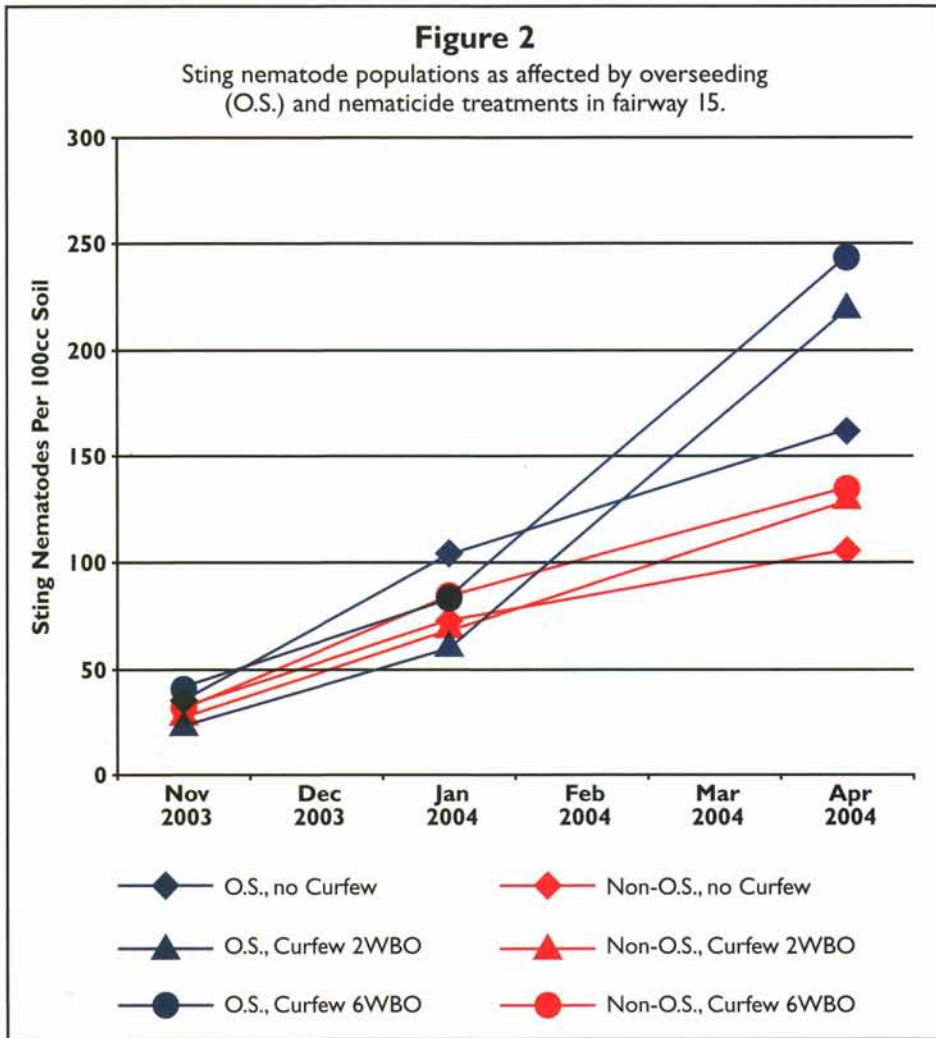
RESULTS AND DISCUSSION

Overseeding improved turf color and density on both fairways during the winter season. That was no surprise, since that is the main objective for overseeding. By the end of spring transition, there were no significant differences between overseeded and non-overseeded plots, indicating that winter overseeding did not have a negative impact on the bermudagrass coming out of dormancy. Therefore, overseeding had positive effects on overall turf quality in these trials.

The effectiveness of Curfew on nematode reduction varied between the two fairways. Curfew reduced sting

nematodes on fairway 10 before overseeding (Figure 1), but it was not effective on fairway 15 (Figure 2). Curfew also improved turf quality of the overseeding cover and the bermudagrass during spring transition on fairway 10 (data not shown). This indicates that fall applications of Curfew can help improve health and quality of winter overseeding cover as well as have a positive effect on bermudagrass quality. An additional observation to be considered is that the overseed established better in and near the Curfew injection slits for treatments applied two weeks before overseeding. This resulted in a striped appearance due to the surface disruption of the Curfew injection, which improved seed-to-soil contact. This occurrence was less pronounced in plots treated six weeks prior to overseeding.





Improved turf quality was observed in nematicide-treated plot on left as compared to untreated plot on right. The same treatments were applied to non-overseeded plots in the background.

The results of the nematode assays were interesting in that sting nematode populations nearly doubled in overseeded plots compared to non-overseeded plots on both fairways (Figure 3). This indicates that the food provided by the roots of the winter overseeding was sufficient to increase sting nematode populations despite low soil temperatures. Therefore, the practice of winter overseeding may be problematic on fairways where sting nematode damage occurs. Since 60% of the fairways in Florida are infested with sting nematodes,¹ this could be an important consideration. It should be noted that on both fairways, the highest sting nematode populations after spring transition occurred when Curfew was injected before overseeding. The most likely reason for this is that those plots had the healthiest overseed and hence more nematode food throughout the winter.

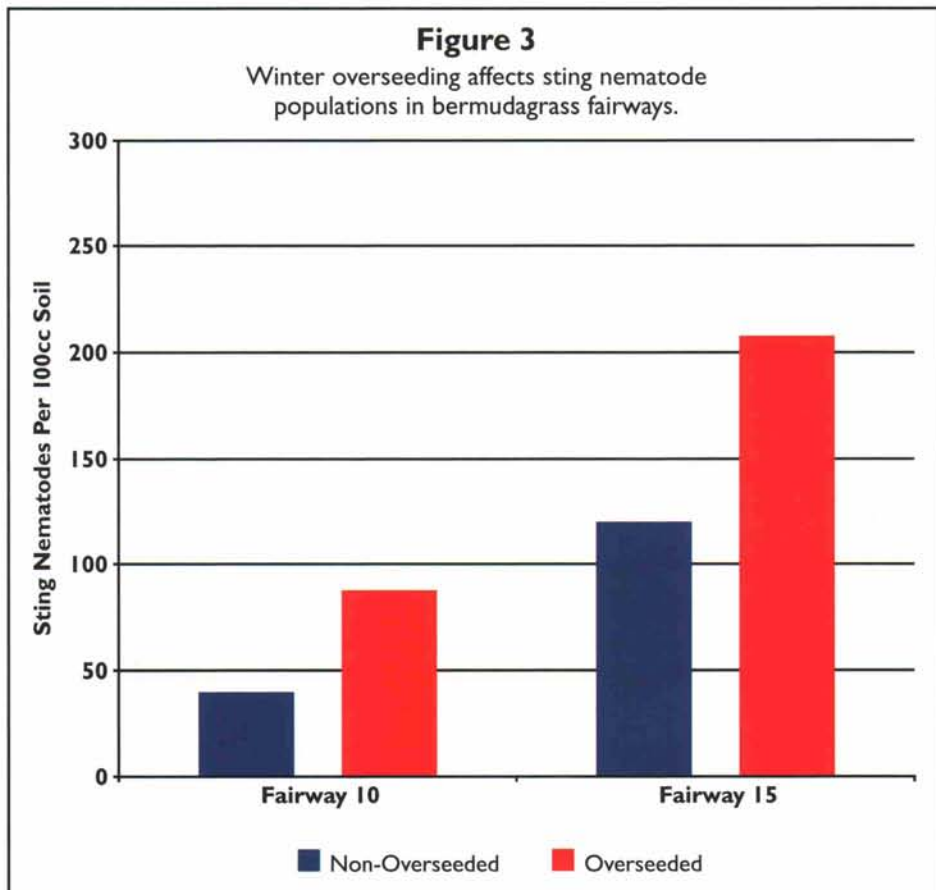
Curfew application timing is critical, since it is only applied once yearly. Based on these studies, fall applications of nematicides, like Curfew, can enhance the health of overseed in sting nematode-infested sites and also improve bermudagrass in the spring. Striping from injection slits can be avoided by scheduling application at least six weeks prior to overseeding. More research on the seasonal population dynamics of sting nematodes and comparisons of the efficacy of treatments applied at different times is needed to make specific recommendations. Currently, research is underway at the University of Florida, with additional funds provided by the GCSAA and the Florida Golf Course Superintendents Association, to generate this information.

REFERENCES

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2. Crow, W.T. 2003. Are Alternatives to Traditional Nematicides a Real Possibility? *USGA Green Section Record*, 41(6):7-8.
3. Crow, W.T. 2002. Nematode, Where Is Thy Sting? *Golf Course Management*, 70(8):103-106.



Nematodes in this bermudagrass fairway are causing premature spring transition of the winter overseeding.



Sting nematodes damage bermudagrass root systems and cause drought-like symptoms to occur. The stunted root sample on the left was taken from the brown section of this fairway, while the fibrous root sample on the right was taken from the healthy turf.

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