

# Better Turf Thru Agronomics

UCRTRAC Newsletter, June 1997

## Sting Nematode Threatens Coachella Valley Golf Courses; Quarantine Is In Effect

*One of the most damaging of all agricultural pests in Florida has gained a foothold in Coachella Valley golf courses, but UC scientists are on the attack to contain its spread in California.*

Spread of the sting nematode in California could have disastrous impact on the turf and agricultural industries, with additional negative repercussions on tourist and recreational trade, warns a UC Riverside nematologist who is studying the pest, a newcomer to the state.

Sting nematode attacks turf, citrus, grapes, and many other agricultural and horticultural crops. Although it has been documented only in the Palm Springs area to date, it can survive and thrive in all of Southern California.

"The sting nematode is considered one of the most damaging of all agricultural pests in Florida; therefore, we must be diligent to ensure that its foothold in California is contained," says **Ole Becker**, UCR Cooperative Extension Nematology Specialist.

The ability of this nematode to feed on a wide host range coupled with the warm climate and irrigated sandy soils of California's inland deserts offer ideal conditions for rapid multiplication and spread of this pest, Becker says.

Since 1992, when it was first discovered in California turf, sting nematode (*Belonolaimus longicaudatus*) has invaded home lawns and at least 10 golf courses in the

(Please see **STING NEMATODE**, page 4)

## Maintaining Bermuda-grass Athletic Fields in LA County: A New UC Report

*A user-friendly UC report provides public turf managers in Los Angeles County with objective, research-based information for improving current maintenance practices on bermudagrass athletic fields.*

Two UC Cooperative Extension turf researchers recently published **Maintaining Bermudagrass Athletic Fields in Los Angeles County**, a user-friendly, 14-page report designed to provide the public turf manager with objective, research-based information relevant to implementing or improving current maintenance practices.

The new report was recently distributed at two seminars in Monrovia and Long Beach, made possible by a grant from the Southern California Turfgrass Foundation.

In Los Angeles County, more than 1.4 million youth in grades K-12 use public school athletic fields and city and county parks, the majority of which are planted to bermudagrass, either common or hybrid.

"Personnel responsible for the upkeep of these facilities face the day-to-day challenge of maintaining safe, healthy, and attractive playing surfaces that can withstand wear and soil compaction. When budgets and resources are limited, the need to develop a strong turf

(Please see **ATHLETIC FIELDS**, page 3)

Xiang Huang



### Sting Nematode (*Belonolaimus longicaudatus*)

- **Obligate ectoparasite**
- **Bisexual reproduction**
- **Wide host range**
- **Physiological races**
- **28-29°C optimum temperature**
- **Life cycle ~ 28 days**
- **Restricted to sandy soils**

Fig. 1. Sting nematodes attack near the root tip.

## Improvement of the Spring Transition of Overseeded Bermudagrass Putting Greens in the Coachella Valley: A Two-Year Study

*Because of confounding environmental variables, any array of factors should be tested for at least two years before reliable conclusions can be made regarding improvement of spring transition of overseeded bermudagrass.*

Current management practices in the Coachella Valley deliver an unparalleled overseeded product for the resort season, from late October through May; however, a systematic study of the cultural practices that will result in a stronger bermudagrass comeback in the spring is needed and was initiated by UCR turf researchers in October 1996.

“Because spring transition is a complex issue involving multiple factors, we should use a systematic, global approach that identifies all of the impinging research factors, prioritize them, and then systematically evaluate their effects on bermudagrass comeback in the spring. The most limiting factors should be studied first and then the less limiting factors can be studied for refinement purposes,” said **Robert Green**, UCR Turfgrass Research Agronomist and the project’s leader.

“Any array of factors should be studied for at least two years before reliable conclusions can be made because of confounding environmental variables,” Green said.

Research factors that influence the pre-overseed through overseed period as well as the overseed season through the spring/summer transition should be prioritized and assessed, Green said.

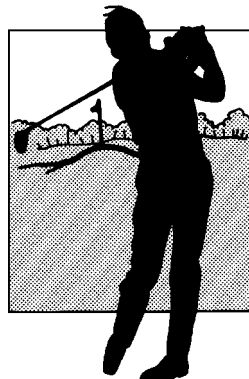
UCR’s two-year research project at the Desert Horizons Country Club in Indian Wells tests four chemical treatments, two scalping levels, and two overseeding rates to determine which combination of these treatments applied during the fall will result in the fastest bermudagrass coverage during the spring-summer transition, without compromising putting green quality during the resort season.

Since cleat traffic can affect the competitive relationship among turf species, UCR’s new putting green traffic simulator is being used on the research plots to yield representative wear during the study.

Visual estimates of bermudagrass and overseed perennial ryegrass and *Poa trivialis* coverage are being measured on key dates throughout the two-year study, Green said.

Soil and air temperature measurements, taken from on-site remote data loggers, are being correlated with bermudagrass green-up, which will clarify plant growth response to important environmental variables and research treatments and facilitate comparing data from multiple years, Green said.

The project is supported by the Hi-Lo Desert Golf Course Superintendents Association. Green’s cooperators are **Grant Klein, Mike Henry, Steve Cockerham**, and **Francisco Merino**.



## Overseeding Pretreatments: An Evaluation

*Pre-overseed chemical treatments do not offer any advantage in overseed success in Coachella Valley fairways, roughs, parks, and greenbelt areas during germination and early establishment of perennial rye, but a PGR pretreatment coupled with a second application one month after overseeding significantly reduces clipping yields.*

There is no advantage to applying pre-overseed chemicals (plant growth regulators [PGR] and contact herbicides) to retard the regrowth of common bermudagrass in the Coachella Valley during germination and early establishment of perennial rye in the overseeding process, says a UC turf researcher who recently completed a two-year investigation at Desert Princess and Indian Wells Country Clubs.

However, a PGR pretreatment coupled with a second application 4 weeks after overseeding significantly reduced clipping yields during the subsequent 5-week period.

“Our objective was to evaluate common overseeding pretreatments being used by turfgrass managers to improve the speed, density, and uniformity of ryegrass seed establishment overseeded into bermudagrass fairways, roughs, parks, and greenbelt areas,” said **Mike Henry**, UC Cooperative Extension Environmental Horticulture Advisor in Riverside County.

The UC study attempted to duplicate the normal practices used by golf course superintendents in the Coachella Valley during the overseeding period from late summer to late October. Standard golf course spray equipment was used, and the study was conducted on a research plot area comparable in maintenance quality to a golf course rough, but it was just out of play and adjacent to the course maintained by the golf course crew, Henry said.

Henry will present the results of

(Please see **PRETREATMENTS**, pg.4)

## Turfgrass Research Conference and Field Day -- Sept 17, 1997

A full day of updates for turf professionals is planned on Sept. 17, 1997 at the annual Research Conference & Field Day sponsored by UC Cooperative Extension, UCR's Botany and Plant Sciences Department, and UCR Agricultural Operations.

The conference includes technical presentations in the morning and on-site field sessions at the turf plots in the afternoon.

"There is a significant amount of turfgrass-related research activity conducted by the University of California research and extension personnel at the Riverside campus and other sites in Southern California," said **Vic Gibeault**, UCR Cooperative Extension Environmental Horticulturist and conference organizer.

Conference participants can earn pest control continuing education credits. The \$35 registration fee covers lunch, materials, and parking. To register, call Susana Velez at (909) 787-4430; fax at (909) 787-5717; or use e-mail: susana@ucrac1.ucr.edu. Enrollment closes on Sept. 11, 1997.

### Technical Session

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The morning technical session, which provides detailed briefings on the latest turfgrass research, begins at 8 a.m. at the University Theatre on the UCR campus.

- Rooting and Dry-down Characteristics of Zoysiagrasses
- Nitrogen Leaching and Best Management Practices for Overseeded Bermudagrass Fairways
- Minimum Air Movement and Irradiance Requirements for Sports Turf in a Retractable-Roof Stadium
- Biology and Control of Smutgrass, Dallisgrass, and Kylinga spp.
- Quality Characteristics of New Bermudagrasses
- Effect of Primo on Tall Fescue Water Stress Relations
- Mowing Heights of 'De Anza' and 'Victoria' Zoysiagrasses

### Field Session at Turf Plots

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The afternoon field session at the turf plots at UCR Agricultural Operations provides an on-site look at the facility's research:

- Low Light Sports Turf
- New Turfgrass Cultivar Evaluation Studies
- Propagation of Zoysiagrass Cultivars
- Zoysiagrass Overseeding Evaluation
- Field Instruments for Soil and Water Measurement
- Nitrogen Product Evaluations on Overseeded Bermudagrass Fairways

### ***ATHLETIC FIELDS***

(continued from page 1)

maintenance program based on sound management practices becomes essential," wrote **Janet Hartin**, Extension Environmental Horticulture Advisor for Los Angeles and San Bernardino Counties and **Vic Gibeault**, Extension Environmental Horticulturist at UCR.

### **Primary and Secondary Maintenance Practices**

To insure that the report is useful to public entities with limited budgets, Hartin and Gibeault identified and distinguished primary and secondary maintenance practices. Primary practices – irrigation, mowing, fertilization, and aeration – are essential to maintain safe, healthy bermudagrass fields. Secondary practices – thatch control, topdressing, overseeding, and pest management – are not mandatory, but often improve turf quality and field playability when implemented.

The 14-page report is packed with practical "how-to", discussion, and analysis for each of the primary and secondary maintenance practices identified in the text.

School districts and public entities are sometimes held liable for injuries sustained on athletic fields with poorly maintained, unsafe playing surfaces; thus, it is cost-effective and beneficial to take care of the turf. Well-maintained turf provides a cushioning surface to reduce injuries to participants in contact sports, such as football, soccer and rugby. Turfgrass also prevents or reduces soil erosion, dust, glare, and noise, and dissipates heat.

Copies of the report may be obtained from Janet Hartin by calling (909) 387-2166.



## STING NEMATODE

(continued from page 1)

Palm Springs area of the Coachella Valley, which are now under quarantine.

According to regulatory authorities, the only location in the state where research on sting nematode can be conducted safely is the Nematode Quarantine Facility at UC Riverside.

UC scientists are proactive in their research, education, and management strategies to limit the spread of this noxious pest, despite few resources being earmarked for the study of sting nematode to date.

Becker and his UC colleagues are extending information to golf course superintendents, pest control advisers, and homeowners to slow down the nematode's spread. Research studies concentrate on biology, population dynamics, and control.

Like all plant parasitic nematodes, sting nematodes feed on crops by puncturing cells with their mouth stylets and then sucking up the cell contents. Sting nematodes are ectoparasites that attack roots in the soil from outside the plant, near the root tip (Fig. 1).

The wounds caused by the nematode's puncturing stylet can serve as points of entry for secondary infections by disease-causing soil microbes, which would not have access otherwise to plant tissues. Secondary infections can increase plant stress and can accelerate root death. Above-ground symptoms of sting nematode infestation are not specific. Plants appear drought-stressed, chlorotic, and stunted. Necrosis and death usually follow.

Sting nematodes are native to sandy soils in the southeastern and midwestern United States and are believed to have been imported here on turf from the southeast.

No turf or soil can be removed from the quarantined Coachella Valley golf courses where sting nematode has been documented, without notifying the Riverside County Agricultural Commissioner. Soil samples should be sent only to a laboratory authorized to run quarantine samples, such as the Nematode Quarantine Facility at UCR, Becker said.

**Now You'll Know...**  
...why lawns are so soft, yet so tough.

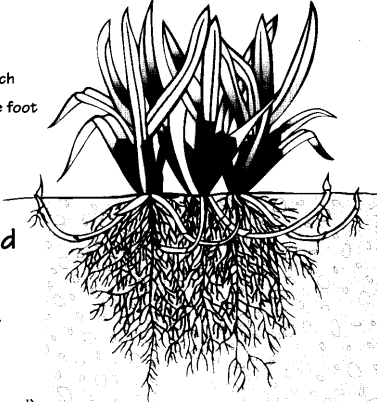
**Above Ground**

In a thick 10,000-square-foot lawn, there are:

- 6 plants per square inch
- 850 plants per square foot
- 8.5 million total grass plants!

**Below Ground**

- 387 miles of root per grass plant
- 329,000 miles of root per square foot
- 3 billion miles of total root!  
(15 round trips to the sun!)



Source: Turf Resource Center  
Rolling Meadows, IL

## PRETREATMENTS

(continued from page 2)

this study in July at the International Turfgrass Society Meeting in Sydney, Australia.

"Scythe," a new contact herbicide, and Primo, a PGR, were tested and compared with a "check" treatment (slow "dry-down" of the bermudagrass prior to renovation and planting of the overseed species without any chemical pretreatments) to determine (1) if the two chemicals offered benefits in obtaining a high quality stand of overseeded ryegrass in the short time frame before the areas open for play and (2) if these chemical treatments maintain turf quality through the fall and winter.

- There did not appear to be any difference in the initial establishment of the check plots and those treated with any of the pre-overseeding chemicals.
- There was no difference in color ratings between the treatments in November and December.
- The percent cover, an indicator of the establishment of the ryegrass vs. the regrowth of the bermudagrass showed no differences except in the first month after overseeding when the check had significantly better ryegrass cover than the treated plots, but this difference did not persist.
- Comparing the PGR treatments (Primo) with the contact herbicide-treated plots (Scythe) showed no significant differences at any time.
- By 7 weeks after overseeding, the differences in clipping weights were significant between the check (highest) and the chemically treated plots and between the plots treated once with Primo and those treated a second time with Primo (lowest).

This study was partially supported by a gift from the Hi-Lo Desert Chapter of the Golf Course Superintendents Association.



**Better Turf Thru Agronomics** is prepared for the delegates and membership of UCRTRAC. The intent is to present summaries of turfgrass research results and topical information of interest to the Southern California turfgrass industries. The newsletter is edited by Vic Gibeault and Deborah Silva and designed by Brad Rowe, UCR Publications.