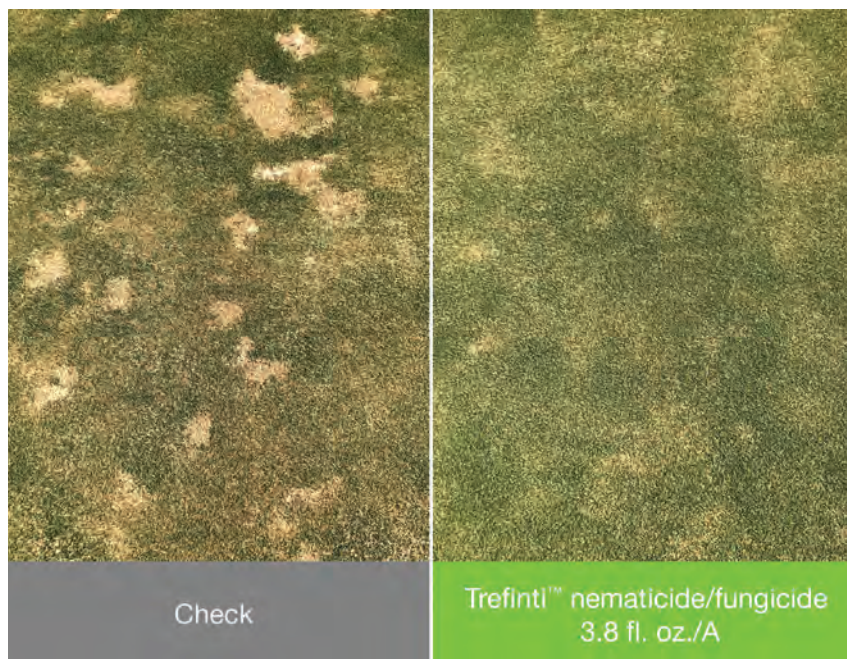




Stopping the spread

A new solution is primed to help superintendents control nematode populations with the added benefits of controlling key diseases.

More than 30 percent of Florida lives at an elevation within six feet of sea level. The entire population of Truckee, California, an outdoorsy community near Lake Tahoe, lives a mile above sea level.

Sandy soils lurk below Florida's warm-season turf. Varied, poorly draining soils sit below Truckee's cool-season turf.

Golf is played year-round in Florida. Truckee's ski season can last longer than its golf season.

High nematode populations in Florida? That's expected.

High nematode populations in Truckee? That's a new one for Dr. Jim Kerns, who has

studied the turf-damaging pests for more than two decades.

From sea to now mountains—and plenty of points in between—the adaptation of nematodes to different environments and conditions continue to enthrall researchers and befuddle superintendents.

"When I was a student, nematodes were always an issue," says Kerns, hearkening to his days as an undergraduate in the late 1990s and early 2000s at NC State University, where he has been a plant pathology faculty member since 2012. "But it was predominantly east of I-95, where we have more sandy soils, native soils." I-95 separates the coastal third of the Carolinas from the rest of the golf-rich region. **"In the**

Spring Dead Spot Control in 'Champion' Ultradwarf Bermudagrass

Source: Dr. Jim Kerns, NC State University, Raleigh, North Carolina. Trial conducted on 'Champion' ultradwarf bermudagrass maintained at 0.125" HOC. Application dates: Sept. 29 & Oct. 28, 2021. Photos taken April 28, 2022.

last five or six years," Kerns adds, **"we have definitely seen an increase in root-knot nematode pressure and lance nematode pressure."**

The Carolinas represent the research home for Kerns and his NC State peers. They also receive microscope-level glimpses of issues and false alarms elsewhere as part of their NC State Turf Diagnostics Lab duties.

Every ecosystem supports nematodes. "They're the most abundant animal on the planet," Kerns says. "It's just whether certain species get to a population density that's 'damaging.'" Damaging levels have been reported in Las Vegas, an emerging "hot-bed" for root-knot nematodes, according to Kerns. **And they're not just a southern or western issue.** Kerns has seen turf samples with nematode damage hailing from multiple Canadian provinces, including Ontario and Alberta.

Not all nematode species act the same.

Sting nematodes migrate between plants, temporarily enter roots and feed before repeating the nomadic activity. Root-knot nematodes seek permanent homes, with juveniles entering roots to establish feeding sites. Lance nematodes act like hybrids, as they move between and within roots.

Nematodes don't immediately ravage significant swaths of turf. Instead, their populations methodically increase, causing constant stress by feeding off the host. Challenges stemming from controlling soil-borne pathogens exacerbate population rises and subsequent damage.

"The best way I can describe it is that golf course superintendents are basically scratching their heads like, **'I am pretty sure I've delivered enough water. I think I've delivered proper fertility.'** And these plants just aren't responding," Kerns says. **"That's what I always use as a simple metric."**

"And second, if you're still struggling with soilborne disease management like *Pythium* root rot or summer patch on

cool-season greens or you just can't get take-all root rot or mini ring under control on warm-season greens ... you probably have an underlying nematode issue that needs to be addressed."

The introduction of what Kerns calls "softer" products following the EPA-directed phasing out of Nemacur have altered nematode control on golf courses. Nemacur, an organophosphate nematicide with fenamiphos as its active ingredient, was permanently banned for all uses in October 2017. The industry has struggled to find a nematicide capable of controlling sting, root-knot and lance nematodes since Nemacur's banishment. However, new advancements are offering improved options. "The products that the companies are producing are so good on those targeted pests," Kerns says, "but they're not affecting other organisms." Multiple products with active ingredients formulated to significantly suppress sting and root-knot nematodes have entered the market. But, until the recent release of a new active ingredient from Syngenta, superintendents lacked a solution also adept at handling lance nematodes.

"Most of the nematode biology work is done by our colleagues in field crops and vegetables," Kerns says, "and they really only focus on root-knot and cyst nematodes. With lance nematodes, there's a general lack of knowledge about their biology. But, I think, there are now some products that are going to be successful in suppressing the population."

One of those new products arrived in

late 2025, when the EPA granted approval of **Trefinti™ nematicide/fungicide**, which is powered by TYMIRIUM® technology (*cyclobutrifluram*). Classified as an SDHI, Trefinti controls sting, root-knot, lance and *Anguina* nematodes, along with soilborne diseases such as take-all root rot, mini ring and spring dead spot.

Trefinti emerged from a screening process of around 6,000 compounds and earned "reduced risk" status in 2022. NC State, Clemson University, the University of Florida and University of California, Riverside are among the research collaborators that conducted Trefinti trials before its release.

"We've had it in almost every soilborne disease program we've done over that time," Kerns says. "You're hoping that it's going to make it to the market because you just don't know early on if something will. Fortunately, this one is going to see the light of day."

Research trials on warm- and cool-season turfgrass varieties confirmed the efficacy of Trefinti at controlling multiple conundrums superintendents face.

On warm-season turf, Kerns observed how a Trefinti program using the low label rate of 3.8 fluid ounces per acre at a maximum of four applications per year simultaneously controlled key diseases and suppressed nematode populations in fairways. **Kerns calls the performance against spring dead spot in NC State's trials "remarkable," adding that it provides "solid" control of take-all root rot.**

An intriguing development for warm-season superintendents is research demonstrating the effectiveness of Trefinti against mini ring on greens with early- or mid-summer applications. The earlier timing coincides with research suggesting fall, a popular time to spray for take-all root rot control, might be too late to begin a mini ring control program.

"I'm excited we can target different things at different times of the year," Kerns says. "With mini ring, I'm almost convinced

you can't have mini ring if you don't have an underlying nematode issue."

Understanding which nematode species and diseases are targeted maximizes the benefits of Trefinti for warm-season turf. Kerns, though, cautions against overusing Trefinti and other SDHI solutions to ensure pests don't become resistant to an active ingredient. Divanem® nematicide, released by Syngenta in 2017, is among the compatible rotational partners with Trefinti to offer a different mode of action. "What's really cool is you have a lot of options now to manage nematodes and some of these soilborne diseases," Kerns says.

Optimizing the full benefits of Trefinti on cool-season turf also hinges on proper targeting of pests and diseases. For superintendents **targeting root-knot nematodes** on cool-season turf, NC State's research shows that using the **spot treatment label rate of 7.6 fluid ounces per 10,000 square feet beginning when soil temperatures reach 60 to 65 degrees provides "exceptional" control.** For superintendents **targeting lance nematodes**, Kerns adds that research conducted in the North Carolina mountains indicates control is **more effective when soil temperatures are around 75 degrees.**

Trefinti trials on cool-season turf demonstrate success in helping reduce soilborne pathogens. But Kerns urges superintendents to think nematode-first when incorporating nematicides into a program.

"If you have cool-season putting greens, it's really going to depend on what nematode you are trying to target," Kerns says, "And I always like to think of it as more of what are we trying to get for the nematode and then understanding that it does give you control of other diseases." ●

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More on Trefinti

Scan the QR code to watch how the Dormie Club in the North Carolina Sandhills is incorporating Trefinti into its nematode and disease control programs.

