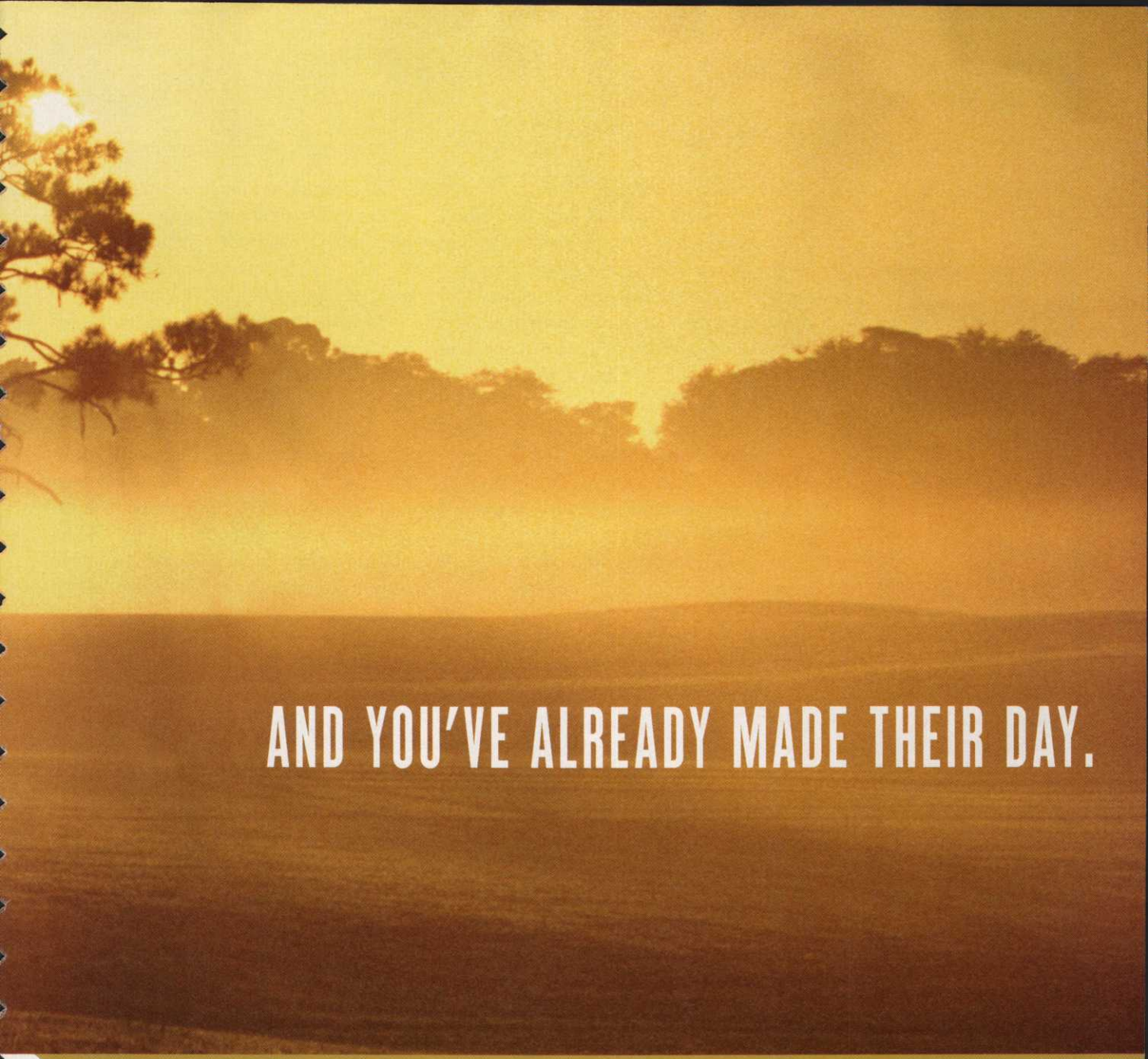

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"It's heartbreaking stuff, but at the same time it's so inspirational."

– BRIAN GOODWIN

Continued from page 59

"I saw balloons and kids laughing," Cavanaugh says, his eyes widening. "The whole place is painted in bright colors and very cheery. It's absolutely incredible."

Cavanaugh and other employees met several ill but happy children that day. One 5-year-old girl told Cavanaugh about "the tumor in my tummy."

Perhaps there's nothing sadder than a 5-year-old child with cancer. But so many of the sick kids at St. Jude provide an emotional boost to others through their strength and faith, Goodwin says.

"It's heartbreaking stuff, but at the same time it's so inspirational," he adds.

Joan Matthews, a special events consultant for St. Jude, provided the tour for the Floratine employees.

"When we got through it, Kevin said to me, 'I was afraid I wouldn't handle being around those children,' " Matthews remembers. "He was completely blown away."

But Matthews isn't surprised that Cavanaugh was so pleasantly surprised by what goes inside the St. Jude's walls.

"It's an upbeat and hopeful place," she says. "It's not maudlin or downtrodden."

Matthews first met Cavanaugh and Goodwin when the two men invited her to Floratine's headquarters in the fall of 2006, shortly after they took over the company's operations. (In October 2007, Goodwin became CEO of FBS, a spin-off company. Cavanaugh is now president and CEO of Floratine.) Cavanaugh and Goodwin told Matthews they wanted to help raise money for St. Jude, a world-renowned facility that aims to advance cures and prevent pediatric catastrophic diseases through research and treatment. St. Jude, founded by the late actor Danny Thomas, is the only pediatric cancer research center in the country that pays for all treatment not covered by insurance, regardless of a family's ability to pay. Hence, it costs about $1.4 million a day to operate St. Jude.

Matthews didn't know much about Floratine when she arrived at its modest facility for a meeting with Cavanaugh and Goodwin. But she was quickly impressed upon meeting them. When Cavanaugh was introduced to her as a former course maintenance employee of Augusta National Golf Club, Matthews, a huge golf fan, was awestruck.

"I said, 'I'm not worthy!' " Matthews says. "Kevin looked at me and just started laughing."

With the ice broken, Matthews listened intently to Cavanaugh and Goodwin pitch her on their idea, and she realized they were interested in doing more than just a small golf tournament as a fund raiser. When they told Matthews they wanted to begin a series of golf tournaments around the world, it was clear to Matthews that Cavanaugh and Goodwin were committing themselves and their company to partner with St. Jude in a much bigger way.

"We told Joan our vision and that it was not a marketing exercise to drive revenue to our company," Cavanaugh says. "It was just something we wanted to do."

Floratine's vision is to raise millions of dollars for St. Jude. The company has already raised several thousand dollars for the hospital, including about $60,000 in proceeds from the past two mega-parties the company held at the Golf Industry Show. But it plans to raise much more.

While their fund-raising plan calls for golf tournaments around the globe, Cavanaugh and Goodwin want to start the project small to get it right. They're planning the first tournament in Memphis this summer.

Initially, Cavanaugh and Goodwin want to raise enough money through the tournaments to pay for one day of St. Jude's operation. "We will draw on our friends, distributors, consumers and suppliers to help us accomplish this wonderful project," Goodwin says.

The working theme for Floratine's event is "kids golfing for kids." The idea is to hold a tournament with predominantly young players. Those players would sign up pledges to sponsor them a certain dollar amount per hole they play. For instance, if one player signs up 20 sponsors to pledge $2 a hole and he plays 18 holes, he would raise $720 for the cause. A foursome with the amount of sponsors for the same pledge would raise $2,880.

"St. Jude doesn't care if we raise $5 or $5 million," Cavanaugh says. "They will take the money and do good things with it."

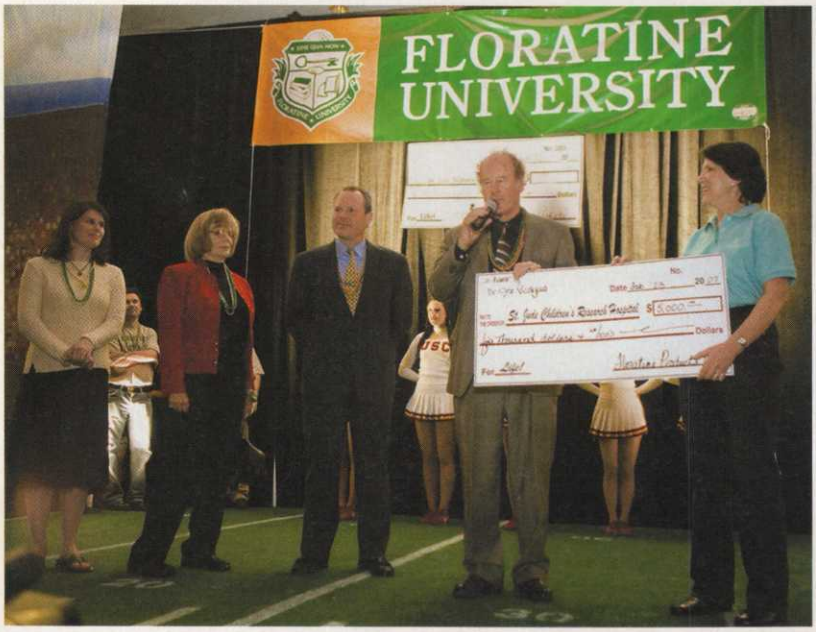
Cavanaugh and Goodwin want Floratine sales representatives and distributors to spread the word in their communities about the tournaments and to recruit golf course superintendents to host tournaments.

Cavanaugh says Floratine will help pay any overhead costs. He also welcomes support from any golf course to help with those costs. Matthews says the brass at St. Jude loves the idea of the "kids helping kids" tournaments. St. Jude relies completely on outside donations to pay its costs. "No family is ever asked to pay for any treatment," she says.

Neither Cavanaugh nor Goodwin has had a child with cancer. Cavanaugh's mother, Karen, survived breast cancer a few years ago. Cavanaugh was a Floratine distributor in South Carolina then, and he purchased hundreds of pink breast cancer awareness bracelets to distribute to his customers. "I wanted to do something for my mom," he says.

In 2006, Goodwin invited Cavanaugh to become Floratine's vice president and part owner. Cavanaugh accepted and told Goodwin how much he enjoyed promoting breast cancer awareness in South Carolina. "We got to talking about things and decided to pursue helping St. Jude," Cavanaugh says.

Continued on page 64



Michigan State University's Joe Vargas presents a check on behalf of Floratine to St. Jude's Joan Matthews during the 2007 Golf Industry Show in Anaheim.

Continued from page 63

At meetings and trade shows, Floratine promotes St. Jude's cause. The company has even placed St. Jude's logo, the silhouette of a child over an arc, on its pullover jackets.

Scott McNeer, a certified superintendent and director of operations for Spring Creek Ranch in Collierville, wears a clasp of the St. Jude logo on his coat. McNeer is so impressed with Floratine's commitment to St. Jude that he has joined it.

McNeer's 4-year-old daughter, Emma, spent several months at St. Jude being treated for a rare form of liver cancer in 2005. Emma was deemed cured last July. It's a coincidence that a superintendent of a golf course only a few miles from Floratine's headquarters had a daughter treated at St. Jude.

McNeer didn't know Cavanaugh and Goodwin when Emma was at St. Jude. He met them shortly after they joined Floratine's management team. When Cavanaugh and Goodwin learned about Emma's stay at St. Jude, they asked McNeer if they could use her story to help promote St. Jude.

McNeer was skeptical at first. He hoped Cavanaugh and Goodwin weren't supporting St. Jude as a marketing initiative for the company. But after hearing their plan, McNeer realized it was solely about helping St. Jude and had nothing to do with Floratine. And while McNeer and his wife, Kim, didn't want to put the spotlight on Emma, they knew telling her story could help raise money for St. Jude. "It's an opportunity to raise a lot of money for what I feel is one of the greatest charities in the world," McNeer says.

Emma was 13 months old when she was diagnosed with the cancer. She not only endured life-threatening surgery, she also braved four rounds of chemotherapy, in which she lost her hair and eyebrows. While Emma spent four months at St. Jude, McNeer never saw a hospital bill. He estimates Emma's care cost about $1 million, but he didn't have to pay a penny out of his pocket.

Last November, Floratine held a golf tournament during its distributor meeting in Tunica, Miss., with $5,000 in proceeds going to St. Jude in Emma's name. That night at a dinner, McNeer accepted the signatory check while holding Emma in his arms. He told Emma's story to the hushed and touched crowd.

The more he's around Cavanaugh and Goodwin, the more McNeer sees their commitment to St. Jude.

"They have a true thirst to learn about what's going on at St. Jude," McNeer says. "They can rattle off statistics, such as the percentage of leukemia patients who have been healed. They know the doctors at St. Jude."

Goodwin says his work with St. Jude reminds him of what's really important in life.

"This type of work tends to center you," he says. "What we do every day to make a living is important, but there are other ways to define yourself."

When he thinks of the ill children at St. Jude, Goodwin realizes that most people don't have the problems they think they have.

"We have irritations and we have issues, but we don't really have any problems compared to a lot of folks," he says.

Through Floratine's efforts, Cavanaugh and Goodwin hope every superintendent in the country become familiar with the St. Jude logo. "We all know what the Callaway and Nike logos look like," Cavanaugh says. "Well, I want the St. Jude logo to find its way into superintendents' minds.

"I want every superintendent to know what it is — and what it means." ■

If you would like help to help Floratine in its effort to support St. Jude, please contact Kevin Cavanaugh at cshort@floratine.com.

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TURFGRASS TRENDS

PYTHIUM ROOT DYSFUNCTION

P.volutum Can be the Cause for *Pythium* Root Dysfunction

By J.P. Kerns and L.P. Tredway

Since 2002, many golf course superintendents in the southeastern United States have reported unusual patches appearing on their creeping bentgrass greens. Symptoms appeared during the heat of summer in irregular patches ranging from 6 inches to 12 inches in diameter. Grass in affected areas was initially wilted and chlorotic, but later exhibited a yellow to orange foliar decline. The patches resemble the stand symptoms of take-all patch (Figure 1), and microscopic examination of affected tissue revealed necrotic crowns, which is another symptom of take-all patch.

As a result, many pathologists, ourselves included, diagnosed the problem as take-all patch. Yet, the fungicides typically used for take-all patch were not effective against the disease. Furthermore, isolations revealed that the take-all pathogen was not present in the affected areas.

It was not until the fall of 2003 and spring of 2004 that we discovered another pathogen in the infected root tissue. During this period of unseasonably hot, dry weather, we found an abundance of *Pythium* hyphae, oospores, and sporangia (Figure 2) in the root tissue. Furthermore, examination of affected root tissue revealed bulbous root tips, loose cortical structure, and an absence of root hairs (Figure 3). To our fortune, we found two papers by Clinton Hodges at Iowa State published in the mid-1980s that described very similar symptoms. Hodges observed that two *Pythium* species, *P. aristosporum* and *P. arrhenomanes*, were associated with irregular patches and roots that were tan-colored, devoid

Continued on page 68

FIGURE 1

This advanced Pythium root dysfunction on A-1 bentgrass can be misdiagnosed as a patch in early onset.

IN THIS ISSUE

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FIGURE 2

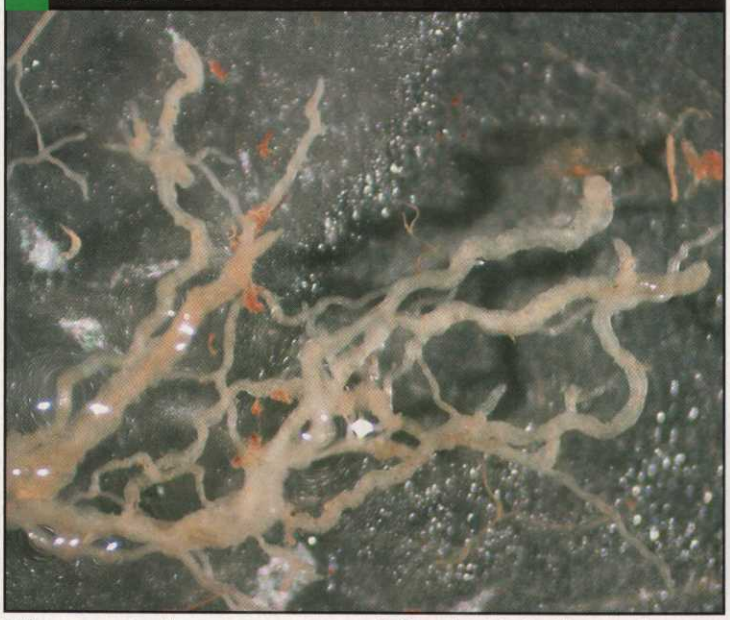
***Pythium* hyphae and oospores in creeping bentgrass roots that are associated with *Pythium* root dysfunction patches.**

Continued from page 67

of root hairs, lacked cortical structure, and possessed dead bulbous root tips. Hodges coined the disease *Pythium* root dysfunction (PRD) because there was no apparent rotting of the roots, and the root tissue was not functioning properly.

Pythium root dysfunction also was observed by Feng and Dernoeden in Maryland in 1999. They collected 28 isolates from 109 putting green samples exhibiting symptoms of *Pythium* root dysfunction and identified eight different *Pythium* species. The researchers concluded that *P. aristosporum* was the most important causal agent of PRD based on frequency of isolation and aggressiveness toward creeping bentgrass seedlings. Following these accounts of PRD, little work has been conducted on this disease. Therefore, very little is known about the etiology, epidemiology and management of PRD. Our work at North Carolina State University has focused on the etiology and epidemiology of PRD in order to develop effective management strategies for superintendents.

FIGURE 3



When creeping bentgrass roots are infected with Pythium volutum, the roots lack root hairs, have bulbous root tips and have a mild, tan color.

Etiology of *Pythium* root dysfunction

Since 2003, 80 isolates of *Pythium* have been collected from 14 golf courses in North Carolina, South Carolina, and Virginia. In 2004, we began identifying our isolates using morphological and molecular techniques to determine the *Pythium* species responsible for PRD. Of the 80 isolates obtained, 58 were identified as *P. volutum*; 16 were identified as *P. torulosum*, and the remaining six were *Fusarium*, *Curvularia*, or *Coprinus* species. *Pythium volutum* was the dominant species, isolated from 13 of 14 locations, whereas *P. torulosum* was only isolated from five of the 14 golf courses sampled.

Pathogenicity of these species was determined by inoculating mature A-1 creeping bentgrass plants with one of five isolates of *P. volutum*, two isolates of *P. torulosum* and a combination of the two species. Inoculated plants were incubated for four weeks at 75 degrees Fahrenheit/61 F (day/night) to permit root infection, followed by a heat stress period at 90 F/79 F to induce foliar symptoms. Typical foliar symptoms developed two weeks after raising the temperature to 90 F/79 F. All isolates of *P. volutum* were highly aggressive on creeping bentgrass roots (70 percent to 100 percent disease severity)

Continued on page 70

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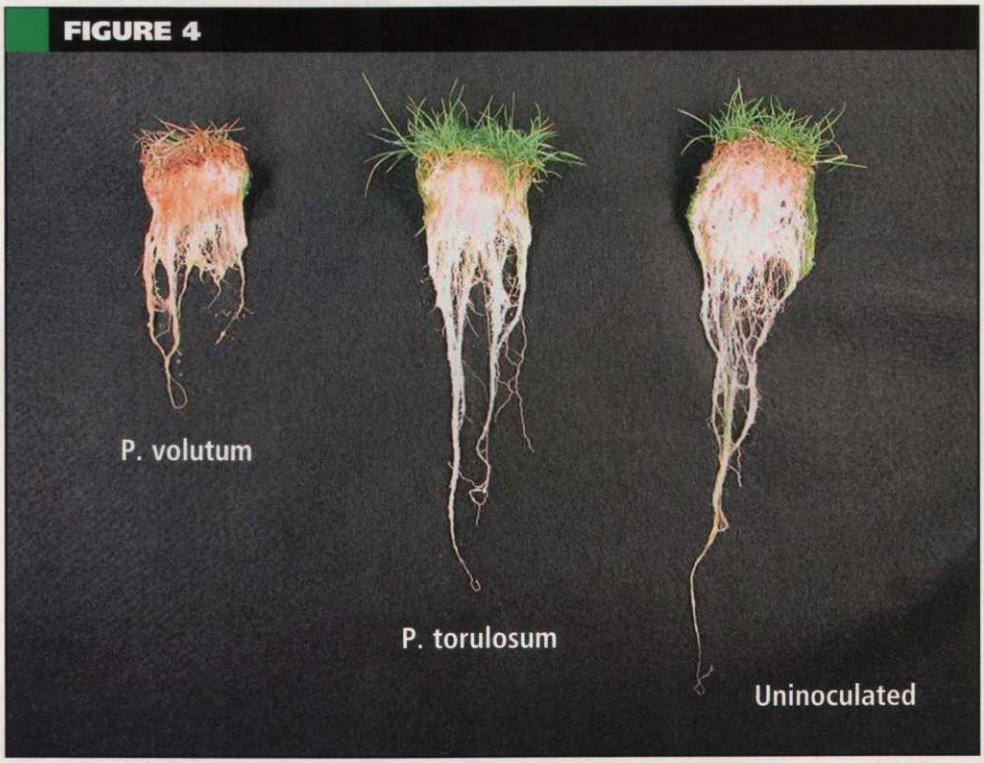
FIGURE 4



Creeping bentgrass root depth with Pythium volutum infections are significantly shallower compared to Pythium torulosum and an uninoculated control specimen.

QUICK TIP

As it should be, Integrated Pest Management (IPM) is a common theme in turfgrass disease management. The fundamental basis for a sound IPM program is turfgrass health. No matter how you look at it, disease control starts with plant health. A weak turf is more susceptible to pathogenic attack, much like a weak immune system makes us more susceptible to disease. Plants have evolved to be quite dynamic living organisms in a very unnatural environment. Understanding biological processes, positioning nutrition to accelerate these and maximizing turf's natural defense system simply makes perfect sense. Please visit www.floratine.com for sound nutritional information.

Continued from page 68

compared to isolates of *P. torulosum*, which caused only 10 percent to 20 percent disease severity. Isolates of *P. volutum* consistently decreased root mass and root depth compared to *P. torulosum* and the uninoculated control after four weeks of exposure to heat stress (Figure 4). *Pythium volutum* was readily re-isolated from diseased root tissue and re-inoculated to creeping bentgrass to confirm pathogenicity.

Epidemiology of *Pythium* root dysfunction

From our pathogenicity experiments, we determined that *P. volutum* was the causal agent of PRD and that infection occurs when soil temperatures are cool. However, PRD symptoms do not develop until creeping bentgrass is subjected to heat stress. We decided to expand on this to determine the soil temperature thresholds for *P. volutum*, which would enable superintendents to time preventive fungicide recommendations based on soil temperatures.

To determine the optimal temperature range for infection by *P. volutum*, A-1 creeping bentgrass was seeded into cone-tainers containing sand meeting USGA specifications and placed in the greenhouse. Eight weeks after seeding, plants were inoculated with one of five *P. volutum* isolates. After inoculation, the cone-tainers were transferred to growth chambers at 54 F, 61 F, 68 F or 75 F. After four weeks, the temperature in all chambers was increased to 90 F/79 F day/night to induce foliar symptoms. Typical PRD foliar symptoms developed in all infection temperature treatments after two weeks of heat treatment. The severity of PRD was greatest when *P. volutum* infected creeping bentgrass roots at 61 F (Figure 5). Reductions in root depth were not observed prior to raising the temperature to 90 F/79 F. However once the tempera-

Continued on page 72