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Spring dead spot pathogens attack the roots, rhizomes, and stolons of bermudagrass and make the turf more susceptible to winter injury.

disease. Generally, bermudagrass should be fertilized with no more than 1 lb N/1000 square feet/month during the growing season, and nitrogen should not be applied within 6 weeks of dormancy. Research has shown that use of ammonium forms of nitrogen, such as ammonium sulfate, can reduce spring dead spot injury. This may be due to reduction of soil pH or other mechanisms (see below).

Potassium applications in the fall have been shown to control spring dead spot, again by increasing bermudagrass winter hardiness. One to two fall applications of potassium chloride or potassium sulfate, totaling 1-2 lb K_2O per 1000 square feet is recommended. The timing of these applications is not critical, but it should be applied early enough so that the bermudagrass can absorb the potassium before it goes dormant.

Take-all patch and summer patch, diseases that are very similar to spring dead spot, are enhanced by high soil pHs. Many have assumed that a similar relationship exists with spring dead spot, but there has been little research to confirm this. We have seen severe cases of spring dead spot in soils with pH ranging from the low 4's to the high 7's. Until the relationship between spring dead spot and soil pH can be clarified, we recommend applications of lime or elemental sulfur only as recommended by routine soil tests.

Speeding recovery

Once the symptoms of spring dead spot appear, very little can be done to control the disease. Steps should be taken, though, to encourage rapid recovery and shorten the length of time when symptoms are evident. It is essential to avoid dinitroaniline herbicides (pendimethalin, prodiamine, oryzalin) or dithiopyr (Dimension) for preemergence grass control in the spring. These also inhibit rooting of bermudagrass stolons into the spring dead spot patches, thereby slowing the recovery process. Where spring dead spot is a persistent problem, oxadiazon (Ronstar) is recommended because it does not inhibit root growth.

Spring dead spot recovery is like a grow-in situation on a small scale. Good stolon-soil contact and light and frequent fertilization and irrigation is needed so that the stolons can root and become established quickly. Regular spiking or aerification is essential to break up the layer of dead turf and provide the roots with access to the soil. Irrigation and fertilization should be light and frequent to 'spoon-feed' the spreading stolons. It is important, though, to avoid saturating the soil or making excessive applications of nitrogen (>1 lb N/1000ft^2/month), as this can make spring dead spot worse in the following year.

What about fungicides?

Many turf managers have attempted to control spring dead spot with fall application of fungicides, only to see the disease return the following spring. This has caused most to abandon fungicide use in frustration. In fact, several extension services specifically do not recommend fungicide applications for spring dead spot control due to erratic results. Remember, though, that spring dead spot control is a long-term venture! Fungicides will never provide complete control in the first year, but rather, certain products will provide a gradual reduction in symptoms over time.

Several fungicides are labeled for spring dead spot control, including azoxystrobin

(Heritage), fenarimol (Rubigan), myclobutanil (Eagle), propiconazole (Banner Maxx and others), and thiophanate-methyl (3336 and others). Over 5 years of research at NC State, we have seen effective and consistent control of spring dead spot from Rubigan 1AS. A single application of 6 fl oz/1000 square feet has been as effective as two applications at 4 fl oz/1000 square feet or 6 fl oz/1000 square feet. We have also seen significant control from Banner Maxx and tebuconazole (Lynx) in some of our experiments.

The timing and method of application has a huge impact on a fungicide's performance. Since spring dead spot is a soilborne disease, fungicides should be applied in large volumes of water (at least 5 gal/1000 square feet) or watered-in with 1/8 to 1/4 inch of irrigation immediately after application. Rubigan applications have been equally effective when made between mid-August and late-October in North Carolina, roughly corresponding to soil temperatures between 60 and 80 degrees. Preventative applications should be made within this window for best results.

Spring dead spot is actually caused by three different species of *Ophiosphaerella*: *O. korrae*, *O. herpotricha*, and *O. narmari*. In the Midwest and Great Plains, *O. herpotricha* is the dominant pathogen, whereas *O. korrae* is most common in the Southeast, Mid-Atlantic, and California. This is important because research in Kansas and North Carolina has shown that *O. herpotricha* is more aggressive than *O. korrae*, and is possibly more difficult to control. Our results may not apply to areas where *O. herpotricha* is the primary cause of spring dead spot.

Certain fungicides claim to speed recovery from spring dead spot rather than reduce the initial amount of symptoms. Some turf managers have also observed that fall applications increased recovery from spring dead spot. Is this wishful thinking or a real phenomenon?

In an attempt to answer this question, we measured the rate of bermudagrass recovery in response to fungicide applications. No fungicides increased bermudagrass recovery, and in fact, Banner Maxx, Heritage, and Rubigan applications actually slowed the recovery rate compared to untreated plots. Regardless, plots treated with Rubigan reached 0% disease more quickly because there were fewer symptoms initially. Recovery rate in the spring should not be considered when selecting a product for spring dead spot control. ■

Research discussed in this article was supported by the Center for Turfgrass Environmental Research and Education at NC State University and the North Carolina Turfgrass Foundation.

Lane Tredway is assistant professor and extension specialist, and Lee Butler is an extension associate at the Turf Diagnostics Laboratory, Department of Plant Pathology, North Carolina State University.

Little spring dead spot is evident on this soccer field (left), while severe damage is seen in the surrounding areas (right). What's the difference? The playing surface was aerified three times in the previous year, while the surrounding areas were not.

Congratulations to the Super Bowl XLI Field Crew

Photo courtesy Denis Bancroft and Miamim Dolphins

STMA appreciates the outstanding efforts of many sports field managers at Super Bowl XLI in Miami.

We recognize the work of Head Groundskeeper Alan Sigwardt and his crew at Dolphin Stadium, NFL Field Director Ed Mangan, NFL Field Consultant George Toma and all the volunteers who worked tirelessly to make the field so amazing for the athletes and the fans.

Despite the steady rain and amazing amount of traffic during and leading up to the game, the Dolphin Stadium field was in incredible condition. Simply stated, it was a "wow"!

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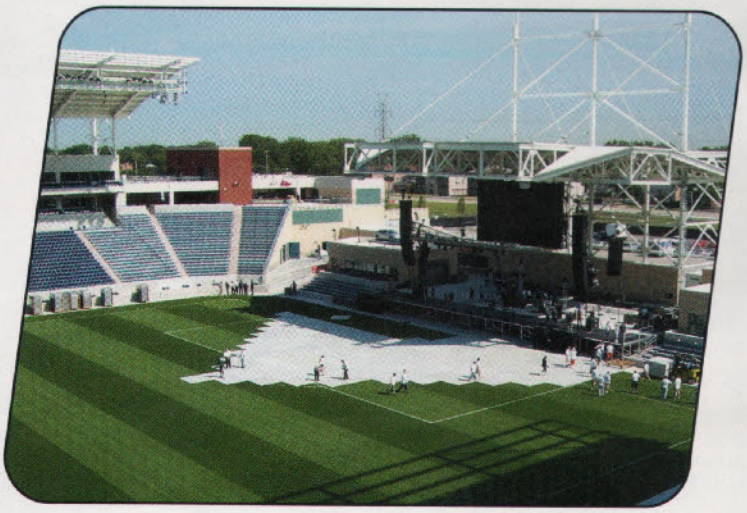


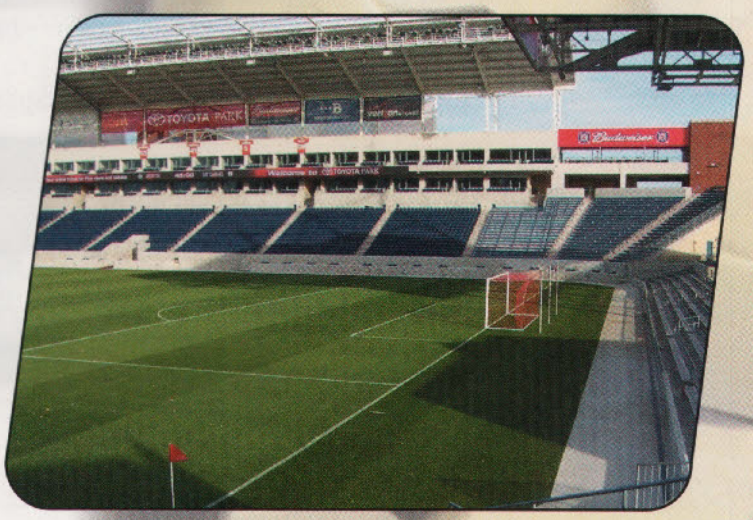
Installing Terraplas for a concert in June 2006.

All 9,000 seats finally set up.

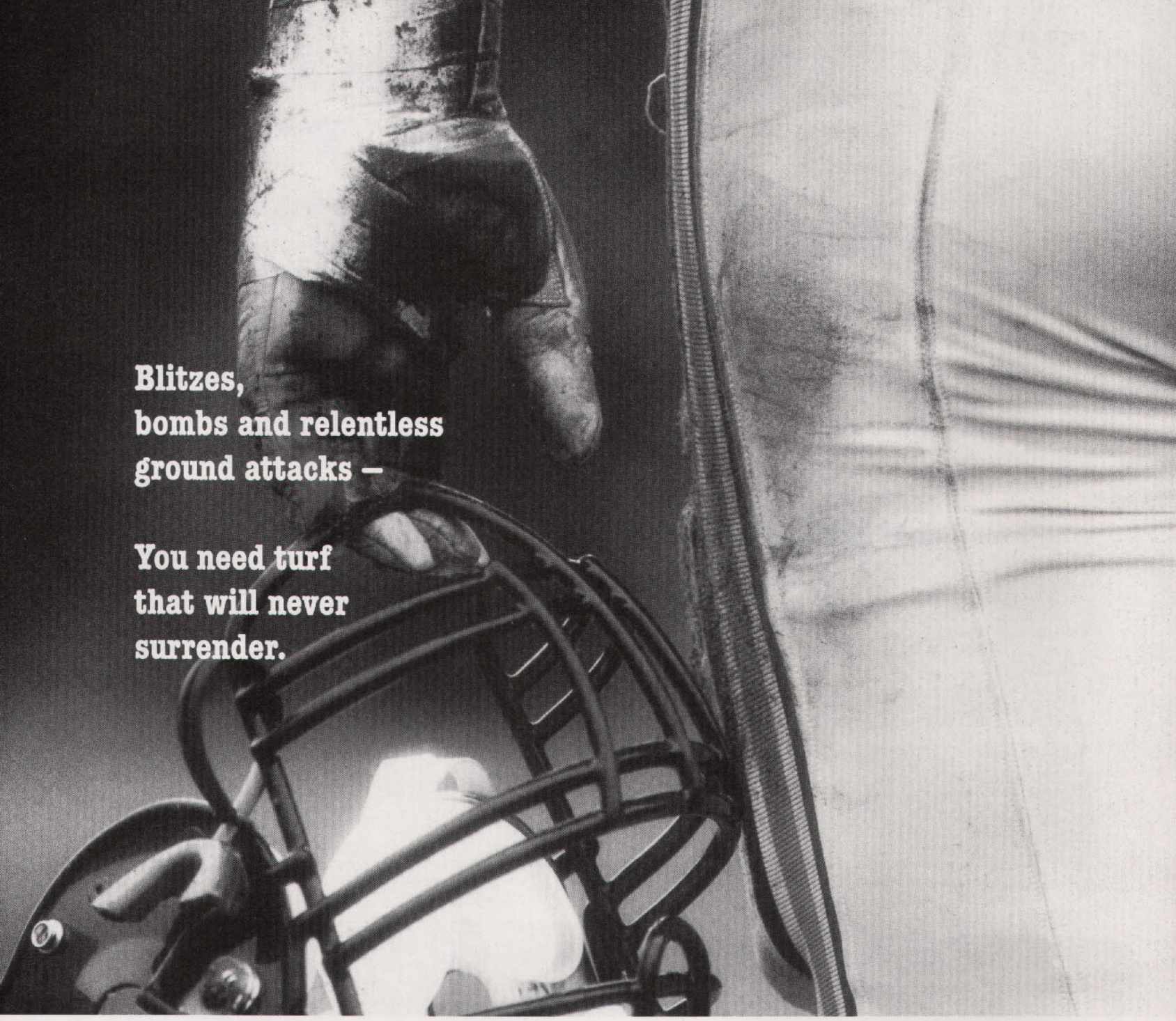
SOCCER-specific STADIUM continues trend

Day after early September Kenny Chesney show that was less than 12 hours before a home game. The last piece of Terraplas was removed 10 hours before the game started.

Toyota Park, paid for by the Village of Bridgeview, IL cost $98 million to build and is the fourth soccer-specific "entertainment venue" in the United States. Located about 15 miles southwest of Chicago's downtown Loop, Toyota Park can seat 20,000 for a soccer game and up to 28,000 for concerts.



Last regular season home game in October.



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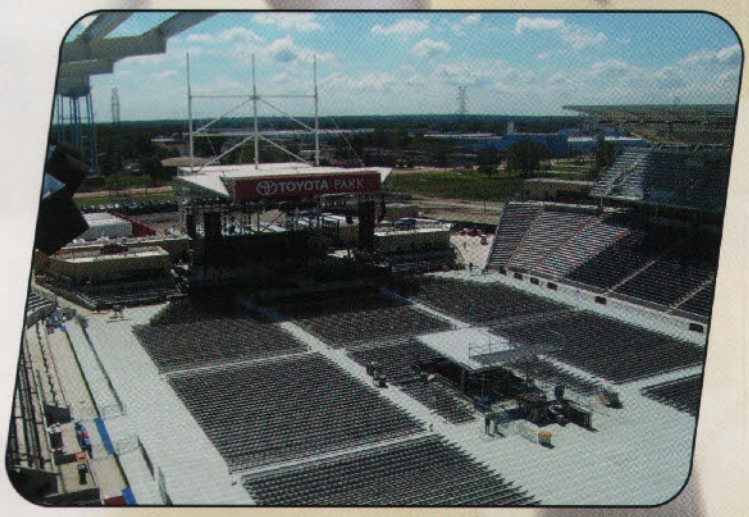
AEG manages the facility for the Village, and Abby McNeal, CSFM, who also serves as Vice President of the Sports Turf Managers Association, manages the turf. The field is 95% sand 5% peat, built on top of 4 inches of pea gravel. It features sub-surface heating and a SubAir system to assist in growing the best turf around, McNeal says.

Built as home to Major League Soccer's Chicago Fire, it also begins serving as home in 2007 to Major League Lacrosse's Chicago Machine. McNeal says a typical annual schedule will include 30-35 soccer games and, for this year at least, eight lacrosse games. Concerts will be determined as the year progresses but so far four are planned for 2007, she says. ■



Chesney concert set-up with 10,000 seats on the floor and the full field covered.

Shade from roof over stage end that limits daylight to goalmouth.

Divots result from lots of play and not enough time to better mitigate the sod-to-sand rootzone.

Toyota Park, 20,000 seats for soccer and lacrosse 15 miles from downtown Chicago.

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Tarp tips: start with communication

By Marcus Dean

Tarping can preserve the playing conditions of your field. If a tarp is put on properly it will prevent excess water from getting on your dirt and causing playability issues. Groundskeepers at all levels watch the Weather Channel and local stations and check internet sites, as well as use computerized weather systems trying to get an edge on Mother Nature. By using all the tools available, we can decide how much water our infield can take and at what moment we need to roll out the tarp to preserve playability.

In the past we've seen TV "highlights" of grounds crews battling with tarps. What fans don't understand is that once a game starts, everything is in the hands of the umpires, who can call for the tarp when THEY think it is needed. If the umps wait too long, they make it very difficult for the crew to get the field ready after a rain delay or even the next game. These umpires have caused some of our colleagues to come under unwarranted criticism.

To help avoid this problem, if you know weather is going to be an issue for an upcoming game, **communicate** with every party involved in the tarping process (umpires, coaches, front office staff, and game workers) to ensure they know what is at stake with your field. Tarping is a lot easier when all parties involved know what the current situation is, what weather is coming, and what the playability consequences are if your dirt gets too much water.

Generally all levels of turf managers rely on their respective teams and any one else with a pulse to pull their tarps. Minor league managers rely on the front office staff to help pull tarp. If you don't have a willing

Dean stores his tarps on 20-foot, double-walled plastic drainage drums with 40-inch diameters.