EMERGENCE CRABGRASS CONTROL

By Dr. David Gardner



rabgrasses (Genus *Digitaria*) are very common warm season weedy grasses on athletic surfaces. There are several species that

infest turf, including smooth crabgrass and large crabgrass (see Figure 1B & C). Crabgrasses begin to germinate when soil temperatures reach about 55 degrees Fahrenheit. Other warm season weedy grasses such as goosegrass germinate when soil temperatures are in the mid 60's, which can be several weeks later.

Crabgrass begins to germinate in January in the extreme southern U.S. The germination date is later as in the northern states, with the upper Midwest typically seeing crabgrass germination in mid April. Early germination mostly will occur along sidewalks and other areas that warm up more quickly in the spring. Oftentimes however, this early germinating crabgrass is killed by late season frosts and freezes. For example, in the Midwest we may see some crabgrass germination in April, but we sometimes don't see the first surviving crabgrass until about the second week of May.

Our first lines of defense against crabgrass infestation are the preemergence herbicides. These products form a barrier in the soil and once a germinating seedling contacts it, the weed is controlled. For a preemergence herbicide to be effective, it must be applied before weed seed germination that occurs after the last killing frost of the season. Typically the herbicide must be applied before a rainfall or watered in within a certain period of time. Check the label for specifics. Because of this, we usually like to allow for about a 3-week window of safety and prefer to target the application accordingly. In the Midwest it is common to time the application by when Forsythia come into full bloom. Forsythia is the common shrub that flowers bright yellow on bare wood and serves as a remarkably effective indicator for when to apply preemergence herbicides (Figure 1A). Other indicator plants are used in the southern U.S., including dogwoods and rhododendrons.

Preemergence herbicides are effective only for a finite period of time after application (weeks or a few months). After application, the herbicide barrier will begin to degrade, at first quickly and then more slowly over time. Once the herbicide has dissipated to a certain minimum threshold in the soil, crabgrass and other weed seeds will begin to break through.

One of the reasons that we try to avoid applying the herbicide too early is to maximize the chance of the herbicide barrier lasting through the season. There are



the overall performance of a preemergence herbicide and how long it will remain effective following application: 1) timing of application, 2) product chosen, 3) application rate and whether the application is split, 4) climate and weather post application, and 5) the amount

of thatch and organic matter in the turf/ soil profile.

Climate and weather cannot be controlled. The warmer the temperatures or the higher the rainfall, the faster the product will degrade or leach and lose effectiveness. Similarly, the amount of thatch and organic matter can usually only be slowly altered over time. Higher amounts of that thatch and organic matter will increase the rate of degradation of the product. Unlike these two factors, however, you do have a choice of product selection, application timing, and the method in which it applied.

You can increase your chances of getting effective season long control by:

1) Selecting a product with a long last-

ing active ingredient, such as prodiamine or dithiopyr. Both provide 90% control for up to 16 weeks. Dithiopyr also has early postemergence activity for those cases where some crabgrass may have already emerged.

2) To increase duration of control, increase the applica-

tion rate (within label limits). The more product that is applied, the longer it takes for it to dissipate to below the minimum threshold level. Also, split applications, the practice of applying once at a lower rate followed again 6-8 weeks later, is not always effective and generally not recommended in the northern U.S.

Figure 1. In the northern U.S., the best time to apply a preemergence herbicide for the control of crabgrass is when Forsythia is in bloom (A). In the southern U.S., blooming of either dogwoods or azaleas is often used to indicate proper timing. Smooth crabgrass (B), which lacks pubescence on the leaf sheath, germinates when soil temperatures reach about 55°F. Large crabgrass (C) and most of the other crabgrasses, have pubescent leaf sheaths.

Generally speaking, in the northern U.S. you should make one application and increase the duration of control by increasing the application rate. If you are in the southern U.S. and you are going to make split applications, you should wait 60 to 90 days (or according to label directions) before making the second application. Also, consult your state's extension literature, because some products benefit from sequential applications and some do not.

What if it's too late to apply?

You have a couple of options. You can wait and treat the crabgrass with a postemergence herbicide. Or, if you are within about 4-6 weeks of the traditional preemergence herbicide application deadline for your area (so about April 15 to June 1 in the Midwest) and your emerged crabgrass has not yet tillered, you can apply one of the products that offers pre-

and early postemergence control. Dimension (active ingredient Dithiopyr) has traditionally served this niche in the market. It is an excellent preemergence herbicide but also will control 1-2 leaf crabgrass postemergence. A new product from FMC, called Echelon, combines the herbicides sulfentrazone and prodiamine and also will afford excellent preemergence control and some postemergence control of 1-2 leaf crabgrass.

If you have or are thinking of applying a product that contains a preemergence herbicide to control crabgrass on thin spots that you are also planning to overseed or reseed,



Use the recommended reseeding intervals for the active ingredients used as preemergence herbicides where cool season turfgrasses are grown. These can be found on the label of a product that contains the herbicide. Note that most of the intervals are long enough that, were they to be applied in March or April, you would not be able to safely overseed until summer. And we all know that summer is not a real good time to overseed.

If you have small areas that are thin or bare, you may wish to apply the preemergence herbicide and attempt to manage the existing grass to fill in the bare spot. If it is a large area, then you are probably best off overseeding and avoiding the use of the herbicide. Alternatively, note that the herbicide siduron is safe for use on seedling turf. Follow the label directions carefully. When used properly, siduron will reduce crabgrass, goosegrass, foxtail, and many summer annual broadleaf weeds by about 80%.

A (possible) new option when overseeding

Tenacity herbicide is a new product from Syngenta that contains the active ingredient mesotrione. This active is in a unique class of chemistry and this product has

a very diverse label, including pre- and post emergence control of both broadleaf weeds and annual grasses. It also controls sedges preemergence and certain perennial weedy grasses postemergence.

Unfortunately, it is not yet labeled for use on commercial turf or sports fields. But, the product was recently labeled for use on golf courses and the label changes are pending to allow its use on other turf areas. When this product becomes labeled for use on sports fields, one of its key uses will be the preemergence control of annual grassy and broadleaf weeds in newly seeded turfgrass. When used

as directed, Tenacity will result in nearly complete control of crabgrass, goosegrass, foxtail, and many summer annual broadleaf weeds. But it will not affect the growth and development of the seedling turf.

Postemergence control options

With the recent cancellation of the arsenical herbicides MSMA and DSMA, the use of preemergence herbicides becomes more important for the control of weeds such as dallisgrass and goosegrass. However, there are several options for postemergence control of crabgrass. Quinclorac was introduced in 2000 and reliably controls crabgrass even after it has tillered. Fenoxapropethyl is another herbicide that offers good to excellent postemergence control of crabgrass. However, it is generally less effective than quinclorac on crabgrass that has til-



Figure 2. Control of crabgrass, goosegrass, yellow foxtail, yellow nutsedge, pigweed, and purslane was nearly 100% when Tenacity herbicide was applied at seeding. Perennial ryegrass was seeded into the area, lightly incorporated and then Tenacity was sprayed over the top on July 25, 2007. Photos taken on August 8. Tenacity's use on athletic fields is pending.

lered. Other options on warm season turfgrasses include fluazifop, metribuzin, and sethoxydim. Regardless of the choice of herbicide, control of crabgrass is better if applied to young plants that have not tillered. Also, since crabgrass is an annual that returns yearly from seed, steps should be taken to avoid the production of seedheads by any crabgrass that is present.

Crabgrass is a nearly ubiquitous weed in turfgrass. In athletic field management, its presence has been particularly challenging because spring time overseeding often precludes the use of a preemergence herbicide. However new herbicides, such as quinclorac, and, hopefully, mesotrione, should make the athletic field manager's job easier when it comes to controlling this weed.

Dr. Dave Gardner is Associate Professor in the Horticulture & Crop Science Department at The Obio State University.

How to use this info

Crabgrass is most effectively controlled with Dithiopyr, or a combination product that conpreemergence herbicides. You can increase your chances of getting effective season long control pre- and early postemergence activity for those by selecting a product with a long lasting active cases where some crabgrass may have already ingredient, such as prodiamine or dithiopyr. Both emerged but has not yet tillered. provide 90% control for up to 16 weeks.

most cases, on areas that you plan to overseed or lers) and before it has set seed. reseed during the spring and summer.

tains sulfentrazone and prodiamine, has both

Best results with a postemergence herbicide are Preemergence herbicides can not be used, in achieved if the crabgrass is still young (<2-4 til-



GENOFF HAS DREAM JOB ON WEST COAST By Tim Londergan



printing toward the end zone, San Francisco 49ers running back Frank Gore has run this play a hundred times before and it

shows. Following his lead blocker, Gore dives across the goal line for six. The stadium erupts in cheers as he celebrates in his grassstained uniform. San Francisco 49ers fans can't get enough of plays like these.

Among them is Rich Genoff, sports turf manager and head groundskeeper at the Marie P. DeBartolo Sports Centre, the 49ers training facility. A Bay Area native, Genoff knows the weeks of hard work that go into every touchdown because every practice snap occurs on his fields.

"Growing up, I would have never imagined having the opportunity not only to do something I love, but for the team I've followed since I was a kid," says Genoff, who previously served as groundskeeper for near by Santa Clara University. "When I got the offer to care for the fields, I was on top of the world."

A 30-year veteran of the sports turf industry, Genoff joined the San Francisco 49ers organization in March 1988. Hired by John McVay, former director of football operations/vice president, and legendary head coach Bill Walsh, Genoff was the first person to maintain the new facility.

"When I came onboard, the facility was still under construction," says Genoff. "My first job was to go out and buy all the maintenance equipment that we were going to need for the fields and grounds."

Also home to the 49ers headquarters, the Centre is situated on 11 acres in Santa Clara, Calif., less than an hour south of Monster Park. "We have a total of three practice fields: two are Tifway 2 hybrid bermuda and the third is Sportexe synthetic Infill," says Genoff.

"By the end of the season, the practice fields are pretty worn out, and our goal is to have them perfect by the time the team arrives for camp." He continues, "It's that cycle nurturing the turf, watching them tear it up during practice, and then reviving it from that damage that really is one of my favorite things."

To reduce overworking the turf, Genoff works closely with the coaching staff to rotate practice fields on a weekly basis, using the Sportexe field on Fridays to provide an additional day of rest for the Tifway 2 turf. In addition to field rotation, he incorporates a number of cultural practices including aerification, verticutting and rolling to ensure turf health.

Mowing at a height of 1 inch, Genoff and his crew perform deep tine aerification three

times a year using 10 inch tines. Additionally, they will verticut and dethatch the fields every few months. "Dethatching is crucial to avoid thatch build up throughout the year from heavy use."

As the fields are hybrid bermudagrass, they do not require a rigorous fertility program. However, Genoff will apply a granular 6-20-20 mixture at the beginning of the year and an IBDU 42-0-0 mixture and ammonium sulfate throughout the season as necessary.

He has also incorporated an insect program with a focus on grubs, which could leave the turf susceptible to weak root systems. "Typically, we treat for grubs at the end of June, first week of July," says Genoff. "We use either Merit or Sevin insecticide at the appropriate acre rate, depending on severity of infestation and when it's identified."

In addition to contending with wear and tear from heavy use and the occasional pest, weeds are one of the biggest challenges. "They're a nuisance, always have been, always will be," says Genoff. "When the fields were first installed, we had cool-season grasses but there wasn't a product that would take the weeds out and leave the desired turf. I lost my field to weeds and there was nothing I could do to stop it," he recalls.

In 1993, Genoff replaced the cool-season grass with Tifway 2. "That changed everything. I didn't have to just acknowledge that the turf was infested with undesirable weeds like Poa annua, I could do something to make sure I was providing the team with the best quality turf."

With its shallow root system, prolific seed distribution and poor drought tolerance, poa annua wreaks havoc on athletic turf. "Luckily, we found a product that effectively takes cool-season grasses like that out of warmseason grasses, like bermudagrass without damaging the turf," says Genoff.

"I apply the postemergent (Revolver) herbicide as a broadcast, foliar spray, as necessary at the rate of 17.4 oz. per acre. It usually takes me about two quarts to cover the entire area."

Genoff continues, "Revolver gets rid of Poa annua, and leaves the Tifway 2 to grow in and establish strong roots. The coaches are happy because the team is practicing on the best possible field conditions, and I feel good because they've come to expect the highest quality."

Last year Genoff's efforts were recognized by the Sports Turf Management Association, when the Marie P. DeBartolo Sports Centre's natural grass fields were named the 2006 STMA Professional Football Field of the Year. "It's a great honor to be recognized by the STMA and my peers with this award," he says.

Tim Londergan is an account executive with Tierney Communications in Philadelphia, PA.

You're Always Ahead of the Game with a COVERMASTER® Raincover...

"Excellent Quality... Competive Prices..."

wrote Johnson Bowie, Associate AD, Drexel University, Philadelphia, PA

Johnson's comments confirm what we hear from the many groundskeepers who use a COVERMASTER® raincover to keep their fields dry and ready for play. Call us and we'll gladly tell you more.

The COVERMASTER[®] Advantage...

- Superior in strength and UV resistance
- Outstanding heat reflective properties
- Light weight easy to handle
- Widest materials for least number of seams
- Largest choice of weights and colors
- Backed by truly dependable warranties

TARP MACHINE VIDEO!

Call, fax or e-mail for a free video. material samples and a brochure.





TARPMATE[™] roller comes in 3 lengths with safety end caps



MEMBER SportsTur



Fill in 120 on reader service form or visit http://oners.hotims.com/14680-120

800



FUNGICIDE ELIMINATES LEAF SPOT BEFORE STADIUM OPENER

hen the University of Central Florida (UCF) received approval to build its new \$55 million football stadium in Orlando

in 2005, Robert Sample, UCF sports turf and grounds director, got the challenging assignment to create the field. Sample worked for nearly two years with his nine-man crew to lay the sprigs for the stadium's Tifway 419 bermudagrass and carefully cultivate the perfect playing field.

Just weeks before the cleats of the UCF Knights and Texas Longhorns tore into the field for the football opener, Sample suddenly had a more devastating and unwelcome opponent: leaf spot.

Leaf spot fungi may be active at a variety of temperatures, but is most commonly associated with frequent moisture on the leaf blades and high relative humidity. Florida's high humidity and the afternoon showers that occur nearly every day in the summertime precipitate the fungal growth.

"Leaf spot is inevitable in our area, but it came at the worst time," said Sample, who brings years of experience as a golf course superintendent to his turf role at UCF.

Bright House Networks Stadium is among the 30 acres of turf Sample supervises at UCF—that also includes the Jay Bergman Field for baseball as well as track, soccer and softball complexes. His challenge is keeping all the grounds well groomed while juggling the coaches' needs and the teams' hectic, yearround schedules.

While the coaches fine-tuned their playbook, Sample and his crew scrutinized the turf and performed final tasks, such as painting the field lines. That's when they noticed the outbreak of leaf spot, which appeared as small to red purplish ovals on the turf. The foliar lesions caused discoloration on the turf, resulting in a "bronzing" effect.

Sample needed help to cure this epidemic quickly. He called on Bob Hess, a trusted distributor from the Orlando area.

"We've had an ongoing partnership with UCF during the creation of this new stadium," said Hess of Howard's Fertilizer.

On one of his routine visits, Hess saw the outbreak of leaf spot and he knew Sample was under pressure with the season opener just weeks away. "My first reaction was to apply fungicide," Hess said.

Sample followed Hess' advice and applied Insignia immediately to his hybrid bermudagrass at a rate of 40 ounces per acre (0.9 ounces per 1,000 sq feet).

Sample was more than pleased with the product's results.

"The leaf spot outbreak was cleaned up by our Texas opener and the field was looking its best at game time," he said.

While the Insignia fungicide application defeated the outbreak, the Knights weren't so lucky. They lost to the Longhorns, 35-32.

Knights fans look forward to many football victories in the new Bright House Networks Stadium. Sample's victory is adding an effective product to his rotation to control leaf spot, while establishing a tradition of turf excellence for UCF athletics.



This article was supplied by Padilla Speer Beardsley, Minneapolis, MN.

Robert Sample



MAKING PRE-GERMINATED DIVOT MIX FOR FIELD REPAIR

By Mike Andresen, CSFM, and Dr. Dave Minner

ost cool-season grasses can be pre-germinated to speed establishment and recovery on athletic

fields. Perennial ryegrass, Kentucky bluegrass, and tall fescue have been pre-germinated and used in a divot mix to hasten seedling establishment. The following program is used by the Iowa State University turf management team to manage the sand-based fields at Jack Trice Stadium and Johnny Majors practice facility. The process is also followed for in-season maintenance on soil-based practice and game fields.

Begin the pre-germination process 4 or 5 days before the time you will actually apply seed to the field. Put a 50-pound bag of seed into a large water tight container and fill the container with tap water. We keep four 50-gallon plastic trash cans on hand and mark them "for pre-germination only." Woven plastic seed bags that seed typically comes in are perfect for pregermination—the water soaks through the bag and the seed remains contained during the draining cycle. Fill the container with water so that the seed is completely immersed. Add 4 ounces of Pana-Sea (or other quality biostimulant or diluted fertilizer solution) to each container with the seed and water.

A heated shop is preferred so that everything equilibrates to about room temperature or 70 degrees F. Do not use chilled water or freezing conditions. Include a fungicide such as Subdue to the soaking mixture during the early football season if seedling damping off by *Pythium* is anticipated, or you can use Apron-treated seed.

Let the seed solution soak in water for 12 hours, then drain seed for 12 hours. It is recommended to have a 12-hour soak cycle followed by a 12-hour drain cycle, followed by another 12-hour soak cycle. For convenience we remove the bags each morning and allow them to drain during the 8-hour work day. Before the end of the work day we set up another soak cycle for the night. There have been times when we simply changed the water (drain the barrel and immediately refill

with soaking solution) daily and seedling success remained high.

We've further experimented by daily aerating the solution with the nozzle of a backpack blower rather than change the solution. Though we don't' recommend this practice, we have not seen significant loss of seed establishment. Success is er and allow a few minutes for drainage. A concrete or smooth blacktop surface works fine for mixing. Dump a 5-gallon bucket of sand on the surface and add some seed, calcined clay, and dye over the pile. Mix on a sheet of plastic or a tarp to avoid staining of the hard surface if desired. Continue adding sand, seed, calcined clay, and dye



Divot dye mix at the beginning.

vital and you should not take shortcuts. Experimenting with the process to fit your program and to potentially improve it is certainly encouraged.

Pre-germinated seed is alive. Even though you may not see root tips the seeds have begun to respire and are alive; there is no turning back now. If the pre-germinated seed dries in storage or in the field after planting it will die. You can refrigerate, not freeze, the living seed for about a week to slow down the growth if you want to plant it later.

Make divot mix by combining pregerminated seed, sand, a drying agent such as calcined clay, and green dye. Many topdressing suppliers now will formulate a divot mix of sand, dye, and other amendments to make our jobs easier. If you go this route, simply add pre-germinated seed to the prepared divot mix.

On the day you want to seed, remove the seed bag from the pre-germination contain-

until you have a layered pile. Shovel the pile to one side and then back again to mix. The recipe is 15 pounds of perennial rye or 10 pounds of Kentucky bluegrass seed, 40 gallons sand, 50 pounds calcined clay, and 32 ounces of a quality turf colorant dye.

Remove divot debris before seeding. Load a 5-gallon bucket half full of divot mix and work the field from sideline to sideline 5 yards at a time. A bucket more than half full is difficult to handle comfortably. After mechanically sweeping the field there may still be debris in the divot that can be swept out by hand to ensure good placement and establishment of the divot mix. Simply work a handful of mix into the divot then firm and level with your foot.

Turf that is pushed-up or bubbled is worked back in place and flattened by foot. Divots that are completely dislodged seldom root sufficiently so they are removed and replaced by a 4- or 6-inch plug taken from a nursery or surrounding area of the field. Any remaining divot mix is spread in worn areas of the field where you can expect players will "cleat it in."

Not all the seed survives but those that do represent mature plants for next year's field. Seeds that are visible after placing the divot mix and seeds that are placed too deep will seldom establish, however those just below the surface will develop if watered. The seeding rates seem very high compared to the normal broadcast seeding rates for grass establishment on bare ground. With divot mix it is important to remember



Dyed divot mix in final form.

that seed is mixed throughout a volume of sand and then the mixture is placed at various depths depending on the depth of the divot.

Seed visible on the surface 1/16-inch dries out and seldom establishes. Likewise, seed planted too deep, below a ½ inch, will not germinate. The seeds that actually make plants germinate from a 1/8-inch zone that lies at the depth of 1/16 inch to 3/16 inch below the surface for Kentucky bluegrass and in a 1/4-inch zone that lies at a depth of 1/16 inch to 3/8 inches below the surface for perennial ryegrass and tall fescue.

For each home game we mix about eight 5-gallon buckets of sand with 15 pounds of perennial ryegrass or 10 pounds of Kentucky bluegrass seed. After filling divots we feel that we are getting about 100 seedlings per square inch. At this rate the divots fill quickly without a negative effect from seedling overcrowding. Some seedlings get trampled and die but those that survive create biomass and a mature turf for the beginning of next year as opposed to bare spots with exposed and compacted soil.

We start the season in September using Kentucky bluegrass since it establishes well during September but due to germination time requirements may not adequately fill divots when seeded in October. During October we switch to perennial ryegrass because it establishes until the end of that month and even into early November. Pre-germinated Kentucky bluegrass divot mix seeded in early September will have nearly 90% of the divot covered with "green fuzz" in 7 days. Perennial ryegrass fills the divots about twice as fast as the Kentucky bluegrass. Pre-germination fills the divots twice as fast as seeding without pre-germination.

One advantage of the pre-germinated divot mix over non-germinated seed is that the pregerminated seed does not require excessive water to get the seeds started. They are already growing and it only takes a little more frequent watering to make the seedlings develop.

We make no changes in our normal in-season irrigation schedules to accommodate for growing in the newly seeded divots. They seem to thrive fine without being micro-managed.

Mike Andresen, CSFM, is Athletic Turf Manager at Iowa State, and president of the STMA. Dave Minner is a turf professor in Ames and one of SportsTurf's "Q&A" columnists (see p. 50).



Taking the post-game divot filling walk



Divot mix seedlings at 4 days.



One-week old divot fuzz.