naturally Flowers wants to get in as many practices and games as possible. It can take up to 24 hours for one inch of rainfall to percolate through the native-soil field enough to allow play.

Flowers says, "We'll use cups to dip water from any puddles that form, and a submersible pump if necessary. Keeping an eye on where water collects helps us identify any low spots. We also rake the skinned base lines by hand occasionally to identify low spots and check for foreign objects. We'll mark low spots and bring them back to level as soon as the area is workable. Mix is moved in by wheel-barrow loads as needed, tilled in, raked and tamped level.

"We drag the infield after each game and practice, always dragging in a different direction and avoiding the turf edges. We first pull a nail drag behind the tractor, then follow with a mat drag. We stop dragging at a different spot on the field each time. We then hand-rake around the bases in a parallel direction along the grass edges, being careful not to allow lips to build up around the grass lines."

During pre-game preparation, Flowers uses water sprayed from a garden hose

to achieve the right consistency for skinned areas.

The entire field is core-aerified once a month during the growing season. The cores are always dragged back into the soil. MSMA and Sencor are sprayed during the summer months to control weeds.

Flowers overseeds with Topflite perennial ryegrass following the last home game in mid-October. He uses 150 pounds of seed on the infield and 700 pounds on the outfield and sideline areas. Prior to overseeding, they mark all sprinkler



A state-of-the-art sprinkler system helps maintain Fike's field, which is enhanced aesthetically by crosshatching of the infield.

heads; then aerate the outfield and sideline areas in two different directions with a pull-behind core aerator.

"We use a verticutter in the infield and hand-rake to removes the thatch – which provides good seed-to-soil contact," says Flowers. "We'll then aerate the infield and spread the seed. Following seeding, we apply a 10-10-10 fertilizer. Approximately one month later we make an application of 30-16-10 slow release fertilizer."

Flowers doesn't tolerate worn areas on the field. Any divots resulting from batting practice and fungos are set back into place, along with a mixture of sand and Topflite perennial ryegrass seed.

He says, "We're currently using two old ten-foot by ten-foot tarps placed side by side to protect the grass in front of the plate area. (A new protective tarp is on order.) All batting practice is thrown from a four-foot by six-foot platform covered with Astroturf carpet, which is placed in front of the mound. We feel you can work hard in practice on our field and still keep it in great shape."

Flowers was one of the first to sod the home-to-first and third-to-home base

continued on page 32

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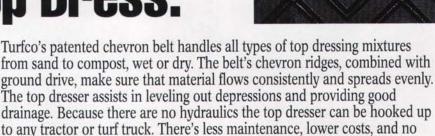
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#### Just Do It!

continued from page 31

lines of a high school field. Under his extensive maintenance program, these areas hold up just fine. Eliminating that section of skinned area is a big time saver.

Frustrated with the wear within the turfed-and-lined coaches' boxes and ondeck circles, and unwilling to "mar the field" with cut outs, Flowers stopped outlining those areas. Players and coaches still stay within bounds, but without a line to "stick to," turf wear is minimal.

During the playing season, Flowers assigns the players small cleanup duties after the game. As a result of 15 to 20 minutes of group effort, their teamwork increases, and they gain a closer connection to their field. Players also take part in frequent team work-days to help tackle the major tasks.

### Always a Way

Flowers thanks his personal "booster club" – his wife, Cindy, and sons, 11-yearold Tripp and 8-year-old Clark – for understanding his love of the field and



Fike's award-winning field features a remodelled press box, dugouts and other amenities.

knowing that he "just can't leave until everything is right."

Flowers says, "Help is out there. All you have to do is let people know what you need and what getting it will accomplish."

"The people here are just amazing. The players' parents and the Booster Club can accomplish wonders. In November of 1989, we talked about getting a press box.

A group got together, and we went around checking out other fields to decide just what we wanted. By the spring of 1990, they'd funded and built what we decided on, a two-story press box with a concession stand and rest rooms. In 1992, they funded and helped install a six-foot-high chain link fence around the outfield and a backstop. Also in 1992, the dugouts received new roofs, shelves and bench seats. In 1993, they worked with the school and Coca Cola to erect a ten-foot by 20-foot Scorebrain scoreboard."

"This field is really a result of a total team effort by the players – past and present – their parents, the school, the Booster Club and all the Fike High School baseball fans. No matter what you have to start with and the limited size of your budget, a great field is possible, if you 'Just Do It!' "

Bob Tracinski is manager of public relations for the John Deere Company in Raleigh, NC, and public relations co-chair for the national Sports Turf Managers Association.





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Natural Turf Management, Part 5

# **Biological Insecticides**

By Alan Goforth

nvironmental, worker safety and efficacy concerns are causing sports turf professionals to rethink insect control strategies. The past decade has seen a dramatic shift away from traditional "harsh" chemicals and toward a strategic approach that integrates the use of chemicals, beneficial insects and biological insecticides.

"The turf industry in general has often been looked upon as heavy pesticide users," says Dr. Steven Alm, associate professor of entomology at the University of Rhode Island. "The industry is definitely now heading toward a more integrated approach."

### **Bacillus What?**

This changing landscape has opened the door for increased use of the biological insecticide Bacillus thuringiensis, commonly known as Bt. Although Bt, a soilliving bacterium, can be found almost anywhere, its exact function in nature is not completely understood. It appears to be readily consumed as food by other microorganisms and does not persist long after being sprayed.

Bt can be readily fermented in large quantities, making it the most commonly used bacterial pest control agent. In this process, the Bt produces a relatively large crystal, which occupies much of the inside of the cell. The particular strain or variety of Bt determines the shape and composition of the crystal, which is responsible for most of the toxic effect on pests.

The key to understanding Bt performance on turf insects is to realize it is not a chemical insecticide. The mode of action is completely different, which also means results are evaluated differently.

Bts work only if ingested by the insect, so they must be applied when pests are actively feeding. A specific pH and specific enzymes are required for the

crystal to solubilize in the insect gut. After ingestion, the Bt binds to a specific site in the gut wall. As the wall deteriorates, the contents leak into the body cavity, while spores also can infect the insect body.

Insects generally die within two to seven days. However, there is no plant damage during this time, because body paralysis causes insects to stop feeding.

Bt insecticides offer many benefits. They are extremely specific and not toxic to most non-target plants, insects and mammals, so beneficial insects survive to provide continued control. In addition, Bts degrade rapidly, have little or no environmental impact and can be highly efficacious.

### **Promising Development**

So why haven't Bts been used more widely? Dr. Harry Niemczyk, emeritus professor of entomology at Ohio State University, offers this assessment after working with Bts since 1971. "Bts are an excellent fit in many situations. However, the problem is that they have not been stable in the soil and have not given us effective insect control."

A new product, on track for registration both nationally and in California, promises to move Bts into the forefront. Mycogen Corporation will market Bt Buibui under the name M-Press<sup>TM</sup> for control of white grubs. The organism (or bacterium), discovered in Japan in 1991, is distinguished by a spherical or ballshaped crystal with a dark outer layer. It is highly specific and controls only certain scarab beetle grubs.

"Japanese beetle grub control will be the best fit," says Paul Bystrak, manager of field development for Mycogen. "It's a problem on the vast majority of U.S. golf courses, except California and Florida.

"In California, it will be effective on the green Junebug. They are large pests and leave clutter on the turf when controlled with insecticides above ground. M-Press controls them below ground, however, which will eliminate this problem."

The product also will be effective against masked chafers in California and Texas, he adds.

#### Success in the Field

It takes a lot to impress Niemczyk, but he's clearly excited about the potential for M-Press on Japanese beetles.

"I can't think of a product we haven't evaluated over the years," he says. "I was absolutely surprised to have a biological agent like this actually move from the site of application (on the surface) through thatch and organic matter to the zone where grubs feed. I was pleasantly surprised by the control. We had never worked with a Bt with this degree of control."

Niemczyk tested the product at four different rates in 1994. "We had what entomologists like to call an excellent infestation that year," he recalls. "In untreated plots, there were 49 grubs per square foot. We applied M-Press in the latter part of August, at the second or third stage of development. We evaluated the results in late September, and the control was fantastic. At the highest rates, Bt Buibui gave us 96 percent control."

Alm noted similar results in his research, although he targeted the Oriental beetle.

"The Oriental beetle is not found throughout the United States, but it can be as destructive as Japanese beetle larvae on turf," he says. "I have tried M-Press for a couple of years on Oriental beetles, and it's been very effective. I've gotten a 96 to 99 percent mortality rate, depending upon the rate."

Bystrak's challenge is achieving acceptable control at an acceptable rate, preferably in the two- to three-gallon-peracre range. Complete control is not necessary, Niemczyk points out.

"You don't need 100 percent control," he says. "You just need to get populations below damage thresholds."

Learning to integrate biologicals into insect control programs will be an ongoing process. Researchers apparently have only scratched the surface of potential Bt uses.

"One company has identified more than 10,000 strains of Bt, so there is great potential," Niemczyk says. "I'm happy the industry is putting money behind biologicals."



### ACTION

### STMA Chapter News

Congratulations to the Minnesota Sports Turf Managers Association - it is now an official STMA affiliated chapter!

Minnesota Chapter: MSTMA's second Workshop on Wheels has been set for Tuesday, July 16, in conjunction with a St. Paul Saints game. For information on the workshop, the Minnesota Chapter or other upcoming activities, contact: Brian Deyak at (612) 255-7223.

Iowa Chapter: Special reminder: the Iowa Sports Turf Managers Association (ISTMA) will hold a Soccer/Football Facility Workshop at the Dubuque Soccer Complex on June 4 from 8 a.m. to 3:30 p.m. Registration opens at 8 a.m. Morning sessions begin at 9 a.m. and include the following: Volunteerism; Soil Sampling and How to Tailor a Fertilizer Program to Test Results; Football/Soccer Field Use Management; Aeration Explanation and Demonstration; and Topdressing Explanation and Demonstration. The noon break features lunch with the vendors and the official opening of the demonstration area. Afternoon activities include the following: Mowing Techniques and Demonstration; Irrigation Alternatives; Seeding/Overseeding Practices and Demonstration; and The Safety Inventory and Its Importance.

For more information on this meeting, the Iowa Chapter or other upcoming activities contact: Lori Westrum at The Turf Office at (515) 232-8222 (phone) or (515) 232-8228 (fax).

Florida Chapter #1: Special reminder: the Florida Chapter will meet on May 21 at Joe Robbie Stadium. Meeting topics will include the field's prescription athletic turf (P.A.T.) system. The field will be set up for baseball, and a tour of the facility will be provided. Meeting host is Alan Sigwardt, sports turf manager of Joe Robbie Stadium.

New: the Florida Chapter will meet on July 16 at the Orange Bowl, site of Olympic Trials Soccer. Meeting host is Dale Sandin, Orange Bowl sports turf manager.

For more information on these meetings, the Florida Chapter, and other pending activities, contact: John Mascaro (305) 938-7477.

Midwest Chapter: Special reminder: the Midwest Chapter's next meeting is scheduled for May 22 at South Park of the Park Ridge Recreation and Park District in Park Ridge, IL. The central theme is turf irrigation systems. Industry experts will discuss the pros and cons of different irrigation systems and methods.

Training with the Bears is planned for Wednesday, July 24, at the Chicago Bears Training Facility in Lake Forest, IL. The meeting will include a tour of the new state-of-the-art training facility.

For more information on these meetings, the Midwest Chapter or other upcoming events, call: The Chapter Hotline (847) 439-4727.

Colorado Chapter: CSTMA will be holding its Summer Seminar on June 5 at Coors Field in Denver, CO. Educational sessions will be held in the morning followed by field tours in the afternoon. Seminar host is Mark Razum, head groundskeeper of the Colorado Rockies' Coors Field.

CSTMA also will hold a Mid-Summer Seminar on July 12 in Grand Junction, CO. For information on these seminars, the Colorado Chapter or other upcoming events, call the 24-Hour CSTMA Chapter Hotline/FAX: (303) 438-9645 and leave a message, or contact: Troy Smith, Denver Broncos, at (303) 649-9000.

Southern California Chapter: For information on the Southern California Chapter and upcoming activities, contact: Chris Bunnell at (619) 432-2421.

### STMA Chapters on the Grow

Arizona: The newly forming Arizona Chapter has already held two meetings. For more information on the Sports Turf Managers Association of Arizona, on upcoming events or to find out how you can get involved, contact: Bill Murphy, City of Scottsdale Parks and Recreation Department, at (602) 994-7954.

Kansas: A new chapter is developing in Kansas. The group is meeting regularly on the last Wednesday of each month. A mid-September seminar is in the planning stages. The same seminar format will be repeated during the designated week at different sites across the state - starting in east Kansas and then moving on to central and west Kansas locations. For more information on monthly meetings, the September seminars - and especially to get involved - contact: Mark Schimming of Wichita Baseball, Inc. at (316) 292-2907, extension 205.

#### **Mark Your Calendars**

The 1997 STMA Conference and Exhibition will be held January 15-19, 1997, in Colorado Springs, CO. More details will be announced soon!

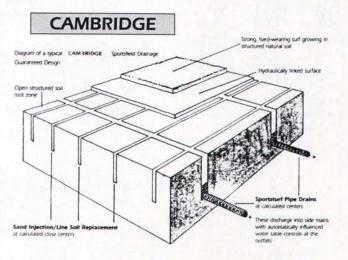
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Celebration perennial ryegrass blend, the second new offering from Burlingham Seeds, consists of new Wizard and Excel perennial ryegrass varieties. It's noted for its dark green color and short growth pattern.

The third new blend, Southern Choice (MB-25-92) turf type tall fescue, is a high performing, dark green, intermediate variety. In 1993 and 1994 NTEP results, it was ranked in the top five in turf quality out of over 90 tall fescues. It has excellent drought and heat tolerance. germinates rapidly and fills in quickly. A good choice for turf in full sun or shaded areas, it also has very good brown patch disease resistance.

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