Is tall fescue right for your field?

SHOULD YOU CONSIDER OVERSEEDING TURF-TYPE TALL FESCUE (TTTF) on high school fields during the slower play summer months? We know it can handle heat and drought better than Kentucky bluegrass or perennial ryegrass, but we've seen it get clumpy after being exposed to traffic. The other question is how long does it take before it becomes more traffic tolerant than perennial ryegrass? Are the few summer months of establishment long enough?

We conducted a 2-year research project at Penn State to try to answer some of these questions.

On sports fields, tall fescue has been traditionally thought of as an aesthetically and sometimes functionally inferior turfgrass species compared to perennial ryegrass and Kentucky bluegrass. However, advances in breeding have resulted in new TTTF cultivars with improved characteristics compared to older cultivars. TTTF cultivars have a medium leaf texture (similar to perennial ryegrass), dense canopy, and dark green color. These aesthetic improvements have allowed TTTF to gain popularity in the lawn industry, especially in and around the transition zone. TTTF provides home owners a lawn that is typically both visually pleasing and functionally superior to other cool-season species in hotter and drier regions of the country. So why hasn't this "buzz" been as popular in the sports turf industry? Especially when high-use, low-budget athletic fields could benefit from a turfgrass that requires less irrigation, fertilizer, and other inputs?

One of the main concerns about TTTF is its unknown traffic tolerance shortly after seeding. Although tall fescue has been touted as being traffic tolerant, this traffic tolerance has been observed in turfgrass stands that have been established for at least 1 year. Most practitioners suggest field use should be delayed 6-12 months after seeding. In most high school athletic scenarios, fields are used continuously during the spring and fall. Major renovations must take place when fields are in the lowest demand: between the late spring and end of summer. This limited time frame has made seeding with perennial ryegrass a logical choice. Perennial ryegrass germinates in 5-7 days and can provide a playable athletic field 2 months after seeding. How does TTTF compare when established during a similar period?

TRAFFIC-TOLERANT ALTERNATIVE?

At Penn State's Center for Sports Surface Research (ssrc.psu.edu), we wanted to evaluate if TTTF cultivars could provide a traffic tolerant alternative to summer renovation using perennial ryegrass. Specifically, could TTTF be seeded late in the spring and be ready for play by the beginning of fall? We conducted two experiments. The first evaluated the traffic toler-

	10-Week Establishment	14-Week Establishment
Cultivar	% Ground Cover	
Fiesta IV (P.rye)	64.0	63.3
Turbo	39.7	68.7
Rembrandt	28.3	63.3
Rebel IV	27.3	58.7
RK4	26.7	63.0
ATF 1376	25.7	58.7
Justice	25.0	56.7
Falcon V	24.3	61.3
Shenandoahl	24.3	60.7
Firecracker LS	22.0	53.3
Faith	21.7	57.3
K-31	9.3	30.0
LSD (0.05)	9.1	9.1

>> **PERCENT GROUND COVER RATINGS** for 10- and 14-week establishment periods: TTTF cultivars and perennial ryegrass (Nov. 17, 2010)

>> **Left: KENTUCKY-31** tall fescue: Coarse-textured, light-green leaf blades.
>> **Right: TTTF:** Dense canopy with medium-texture, dark-green leaf blades.

>> **TTTF:** Visual ground cover. 14-week establishment period (left) resulted in higher ground cover than 10-week establishment (right) (Nov. 17, 2010)

ance of 10 TTTF cultivars, Kentucky-31 tall fescue, and 'Fiesta IV' perennial ryegrass. The TTTF cultivars included RK4, 'Falcon V', 'Rebel IV', ATF 1376, 'Turbo', 'Shenandoah III', 'Justice', 'Firecracker LS', 'Rembrandt', and 'Faith"

Both experiments were established from seed in late spring. We compared two establishment time periods: 10 weeks and 14 weeks. We wanted to see if there was any difference in traffic tolerance between these two establishment time periods. The difference we constructed somewhat mimicked starting traffic during high school pre-season or waiting until a week or so into the season before allowing play. Once the establishment periods ended, simulated field use began using the Brinkman Traffic Simulator (BTS). We trafficked the plots 3 times per week with 4 passes of the BTS per day. We measured traffic tolerance by assessing percent ground cover in late November. It's important to remember that on this date, plots established for 10 weeks received 4 additional weeks of traffic simulation compared to the plots established for 14 weeks.

In Experiment I, our late-November ratings showed traffic tolerance differences between perennial ryegrass and TTTF. When the two species were given only 10 weeks to establish prior to simulated field use, perennial ryegrass exhibited greater traffic tolerance than all TTTF cultivars. However, when species were allowed to establish for 14 weeks before traffic simulation, all TTTF cultivars had at least equal to, and at times, superior traffic tolerance to 'Fiesta IV' perennial ryegrass. Thus we are suggesting that **TTTF can be successfully used as an alternative to perennial ryegrass for summer renovation of sports fields if you can restrict play for at least 14 weeks**. If you can only restrict use for 10 weeks or less after seeding perennial ryegrass will likely perform better.

Of the TTTF cultivars we tested, Turbo, Rembrandt, Falcon V, and Rebel IV consistently performed better than the other cultivars tested. However, the separation between the best and worst TTTF cultivars was not large in either year. Kentucky-31, which is widely regarded as a utility turfgrass, always had the lowest traffic tolerance.

SEEDING RATES AND N FERTILITY

In Experiment II, we wanted to evaluate how seeding rates and nitrogen fertility affect fall traffic tolerance of TTTF after spring establishment. We looked at four seeding rates: 6, 10, 14, and 18 lb/1000 ft.2. We also looked at the following nitrogen rates: 2.0, 4.5, and 7.0 lb of N /1000 ft.2. Our goal was to determine an optimum seeding rate and nitrogen fertility that would maximize traffic tolerance.

Multiple researchers have shown that when traffic is initiated shortly after seeding, it's beneficial to seed perennial ryegrass at very high seeding rates. However, our results indicate that no differences exist when seeding TTTF at rates between 6 and 18 lb/1000 ft.2 if traffic is delayed for at least 10 weeks after seeding. Thus 6 lb/1000 ft.2 is adequate. Although seeding rate had little effect, our nitrogen regimes appeared to significantly influence traffic tolerance, but the results might not be what you would expect. Regardless of the establishment time, traffic toler-

>> **Left: TTTF:** 7 lb N/1000 ft.2 treatment after traffic simulation (Nov. 8, 2010)
>> **Right: TTTF:** 2 lb N/1000 ft.2 treatment after traffic simulation (Nov. 8, 2010)

>> **Left: PERENNIAL RYEGRASS:** 10-week establishment after traffic simulation (Nov. 17, 2010)
>> **Right: TTTF:** 10-week establishment after traffic simulation (Nov. 17, 2010)

>> **Left: PERENNIAL RYEGRASS:** 14-week establishment after traffic simulation (Nov. 17, 2010)
>> **Right: TTTF:** 14-week establishment after traffic simulation (Nov. 17, 2010)

ance was affected similarly by nitrogen fertility. The lowest N regime (2.0 lb/1000 ft.2) applied all at once at seeding, resulted in the highest traffic tolerance during both years of the study.

Let's get back to our big question: is tall fescue a viable alternative to perennial ryegrass during summer establishment of an athletic field? Our research shows that if you can restrict use for at least 14 weeks after seeding, TTTF would be an acceptable alternative to perennial ryegrass for late spring/summer establishment. To maximize ground cover at the end of the fall playing season, TTTF should be seeded using at least 6 lb/1000 ft.2 and that you should apply 2.0 lb N/1000 ft.2. We recommend that the 2.0 lb N/1000 ft.2 should be applied with a slow release nitrogen fertilizer (about 30% water insoluble nitrogen) early in the grow-in to speed establishment, but inputs should be backed off during the season. During both years of our study additional nitrogen inputs during the establishment and/or fall traffic period resulted in lower percent ground cover in November.

If adequate time does not exist to grow-in your athletic field before field use in the fall, perennial ryegrass may be the better option. Perennial ryegrass establishes and matures quicker than tall fescue and appears to better tolerate traffic stress when play begins 10 weeks after seeding.

Before beginning a summer reestablishment with TTTF, a few important considerations should be made. Irrigation should be accessible for at least the first 2-3 weeks to allow the turfgrass plants to germinate and mature enough to tolerate the summer heat. We applied adequate but not excessive irrigation throughout the establishment period in order to avoid significant drought stress.

Also, precautions should be taken to monitor brown patch (a common disease of tall fescue that can be exacerbated by excessive nitrogen fertilization during hot, moist weather) although the same issue exists when establishing perennial ryegrass during the summer.

Lastly, maintenance of these fields will be just as important as the renovation process. Continual overseeding will be just as necessary as before to assist in divot recovery.

In the past, tall fescue use on athletic fields was limited. Tall fescue had a tendency to form clumps, was aesthetically unappealing, and established from seed slower than perennial ryegrass. These obstacles often influenced field managers to choose perennial ryegrass over tall fescue. In lower maintenance situations, tall fescue can outperform perennial ryegrass because it is more tolerant of summer heat, drought, and to some degree disease outbreaks.

The use of newer TTTF cultivars may be appropriate for athletic fields established during a short time period in the summer. When given at least 14 weeks to establish, prior to play, our research at Penn State has shown that TTTF appears to form a traffic tolerant canopy that is comparable to perennial ryegrass. ■

Michael Shelley is an MS candidate studying under Dr. Andrew McNitt at Penn State University. Tom Serensits is the Research Manager for Penn State's Sports Surface Research Center.

Improving our nation's front lawn

After several years of planning, the National Mall, our nation's front lawn, is receiving a well-deserved makeover. There may be no natural grass area in the world that receives the traffic and use that the National Mall has to deal with annually. The National Park Service (NPS) issues more than 3,000 permits a year for the lawn and it entertains 20,000,000 visitors a year. Ironically the number one complaint by people who visit the Mall is its appearance. The long overdue renovation is underway and is projected to be finished just before the next Presidential Inauguration in January 2013.

HISTORY

Over the past 20+ years, the National Mall has had numerous temporary renovations. They've had several turf consultants over the years provide various reports and evaluations for improvement but as usual lack of funding, overuse, poor soils, and compacted earth resulted in dead grass. The NPS manages the lawn and they have used protective flooring systems, engaged in major sodding projects, added new irrigation and taken out old irrigation.

The Trust for the National Mall

THE NATIONAL MALL, which stretches from the Lincoln Memorial to the US Capitol Building, will be transformed from a swath of trampled grass to a grand urban park with spectacular gardens, a skating rink and a tree-framed theater, the Trust for the National Mall said.

The Trust, which is working with the National Park Service to revitalize the Mall, unveiled the winners of a design competition to remake three sections. The projects are part of a $700 million plan to transform the nation's "front yard" into a world-class park.

Former first lady Laura Bush, the honorary chairwoman of the fundraising campaign, said she often donned sunglasses and a baseball cap for anonymous early morning strolls on the Mall during her White House years. She said the "innovative" designs will enhance the experience for the Mall's 24 million visitors each year.

"The Mall is suffering from overuse," said landscape architect Kathryn Gustafson of Gustafson Guthrie Nichol, who helped create the winning design for Union Square, the area that includes the reflecting pool at the base of the Capitol lawn. The first project is scheduled to be done by 2016 to mark the centennial of the National Park Service.

Highlights of the three projects:

➲ At Union Square, a reflecting pool that morphs from fountain to hard surface to pool will accommodate different events and minimize damage to the grass, Gustafson said. The design includes an outdoor museum of gardens extending from the US Botanical Garden.

➲ Constitution Gardens, the park and pond north of the Lincoln Memorial's reflecting pool, will be updated to be ecologically sustainable and to revive the "social life" of the park, said Peter Walker, whose firm, Peter Walker and Partners, created the winning design with Rogers Marvel Architects. In summer, picnickers will be able to rent toy boats to sail on the pond, architect Rob Rogers said. In winter, the pond will become an ice rink. The design includes intimate areas for reading, picnicking and resting, and an indoor pavilion with a restaurant and terrace.

➲ The Sylvan Theater amphitheater, on the grassy slope around the Washington Monument, will be framed by trees that landscape architect Hallie Boyce of OLIN called a "magical setting for performance."

Early in 2009 a project was proposed to the government by the Trust for the National Mall (TNM) and the NPS to perform another study and a plan to renovate the Mall. This time the request was to complete a major renovation instead of applying band aids. Well-known architect HOK was selected to provide design services for the first phase of this multi-year project.

Late in 2009, I was selected as the Official Turf Consultant to the Trust for National Mall & Memorial Parks. The National Trust is raising funds from private sources to continue the improvement of the National Mall for the current phase and the remaining turf panels. In a collaborative approach to improving the turf conditions, HOK engaged additional specialists in the sports turf management world. They brought in consultant Steve Legros from Turf & Dirt, Hagerstown, MD to assist with developing an operational plan; Dr. Peter Landshoot, Penn State professor of turfgrass science, was tapped to provide assistance with selecting the turfgrass; Dr. Norm Hummel, president of Hummel & Company, was brought on aboard to develop the soil structure; and Drs. Erik Ervin and Mike Goatley (current STMA President) of Virginia Tech were asked to perform studies on protective flooring surfaces for the new turfgrass system.

Through this group we developed design and construction specifications for the 36 turf panels on the Mall. Early in the process we made it very clear that the success of this project would require more than improved soils, turfgrass and state of the art irrigation. It would also require a more efficient event management system to monitor and schedule the thousands of permit requests the mall receives each year. In addition to the event management upgrade, the NPS would need to develop a more aggressive turf management program. Calling it the "3 legged stool" became an acronym as without one of the legs the overall plan would fail. The exciting part is that everyone is on board to address each of the important components to ensure the Mall's renovation is successful.

Once the design documents were completed in April 2011, the first Phase of the project was awarded to the Clark Company who began construction this past fall. The first phase includes installing two of four 250,000 gallon cisterns, installing a drainage system, irrigation system, improved soils and sodding with a three-way fescue blend of turfgrass. The first phase includes four panels totaling about 400,000 square feet (closest to the Capitol) and the infrastructure for the cistern system.

TURF PROTECTION STUDY

Early in the process we determined there was a need to evaluate all the methods that our industry has to protect the turf once the project was completed. Defining the type of turf protection required testing so Virginia Tech was provided a grant to complete a study, the Trafficked Turf Systems (TTS). Dr. Ervin, Dr. Goatley and John Royse provided feedback on the study and the objectives. After all the hard work and investment restoring the National Mall

"WITH 25 MILLION ANNUAL VISITORS and more than 3,000 permitted annual events, the National Mall is the country's busiest national park. Unfortunately, this high level of use has taken a heavy toll: the grass is worn down to patches of dirt, the soil is heavily compacted and irrigation systems have been compromised. That is why we, in partnership with the National Park Service, enlisted the help of Murray Cook of Brickman Sports Turf. Murray has helped guide the National Mall turf project with state-of-the-art irrigation, soil and seed composition and maintenance plans. We are confident that with his guidance, the National Mall will be returned to its former glory."-Caroline Cunningham, President of the Trust for the National Mall

grounds, the questioned was poised: "How can the renovated lawn areas be protected during events?"

To ameliorate the problem, they conducted seasonal research on the performance and recovery of several turf covering systems at Virginia Tech that will be used to protect the National Mall. Cover types included in the study range from those commonly used for seating areas, roadways or general turfgrass protection. Time of year and cover attributes greatly affect turf tolerance to extended covering. Tall fescue recovered following 9 days of summer covering with Terratile and Matrax panels, but the turf could withstand only 3 days of covering with plywood or plywood + Enkamat. Terratile and Matrax covers could be left on for up to 20 days in spring or fall, while plywood or plywood + Enkamat only worked for 5 days. The results of this research will provide other turf managers with scientific and technical information for maintaining the integrity of their turf regardless of the season.

ROOTZONE SELECTION PROCESS

Dr. Norm Hummel took multiple tests of existing soil conditions at the Mall and developed a rootzone that was not only less likely to compact but also one that allowed better drainage. There were a number of things that were considered when selecting the soils for the National Mall. A sand-based system was considered but was quickly ruled out for several reasons. For one, the National Park Service wanted to reuse soils if and where ever possible. Second, there are festivals held on the lawn that last several days. Irrigation wouldn't be possible during these long stretches, which are often in the summer. Finally, sustainability of the lawn was a goal of the Park Service without having to incur high maintenance costs.

Soil samples were taken from all of the panels and were tested for particle size and organic matter content. Nearly all of the soils were fine textured, having about 40% sand on average. The soils will be harvested from the panels and will be modified with a coarse, uniform sand in sufficient quantities to increase the sand content of the soil to about 70%. Basically, we have specified that the soil be amended from a loam to a sandy loam. A compost of a specified quality will also be added to increase the organic matter content of the soils to about 5% by weight. In the end, we feel that we have specified a soil type that will hold up better to the intense use and abuse that the National Mall is subjected to.

TURFGRASS SELECTION

As with any turf project you need select the best turfgrass that will meet not only the wear and tear of the events but also provide have the ability to thrive in the region. Dr. Peter Landschoot brought his recommendations to the committee as to the grass seed best suited for the Mall. The seed slated was to consist of 90% turf type tall fescue and 10% Kentucky bluegrass on a weight basis. The seed was recommended to be a mix of one the following groups of species and varieties:

- 30% Wolfpack II tall fescue, 30% Firenza tall fescue, 30% Turbo tall fescue, and 10% P-105 Kentucky bluegrass.
- 30% Rhambler SRP tall fescue, 30% 3rd Millennium SRP tall fescue, 30% Traverse SRP tall fescue, and 10% Bewitched Kentucky bluegrass.
- 30% Turbo tall fescue, 30% Bullseye tall fescue, 30% Hemi tall fescue, and 10% Midnight Kentucky bluegrass.

Due to some changes in construction schedules we are now planning to sod the lawn panels with a similar turfgrass variety using a sod that has yet to be determined [as of mid-April 2012].

As part of the turfgrass management program, Dr. Landshoot developed criteria to enhance the National Mall's existing IPM (integrated pest management) program. The goal of the National Mall IPM program is not to eliminate pests, rather to keep pest populations or damage to a tolerable threshold level. The threshold level is determined by the number of pests or the amount of pest damage that can be sustained before an unacceptable reduction in turf quality occurs. Pests and pest damage during the grow-in will be monitored by daily or weekly scouting. Pest threshold levels vary with the condition of the turf, particular pest species, stage of turf development, weather conditions, and other factors that can influence pests and pest-related injury to the new turf.

Another key player in the development of the turf system for the Mall is Alice McCarty. She is the National Parks Service's landscape architect who has witnessed many of the failed attempts to renovate the mall and has been a staunch supporter of the natural grass system and its ability to sustain more traffic and provide a more aesthetically pleasing area for people to use. Alice explains the major issues the new design is addressing include compaction of soil, lack of irrigation and drainage, regional water management and the restoration of the original design intentions to establish a "greensward" that connects the Capitol and the Washington Monument.

The mechanisms that are being implemented to accomplish the goals set forth by the NPS include upgrading the existing soil structure. The new 12-inch depth sand-based soil placed over a 4-inch course sand bed will allow for better drainage. In addition to the improved rootzone soils a drainage system with laterals every 20 feet are being installed across the Mall at a 4-foot depth. The irrigation system main lines and drainage system will also be placed 4 feet deep to reduce being tapped by the long tent stakes that are used to support the many structures placed on the Mall throughout the year.

The water collection system cisterns will save rain water from the trench drains as well as the walks and turf run-off, and potentially from the roofs of nearby museums. We will use captured recycled water to irrigate as often as possible rather than city potable water, and will keep water on site rather than dumping it into the Potomac River and Chesapeake Bay.

Another design component being implemented is the restoration of the Granite curbs that are installed along edges of the lawn panels. These contribute in several ways to the overall goals. They will define the drive-no drive areas; give a finished maintainable edge to the grass; respect the original street curbs that pre-dated the pedestrian paths; allow handicap access since they are so flat; and provide water collection points (trench drains).

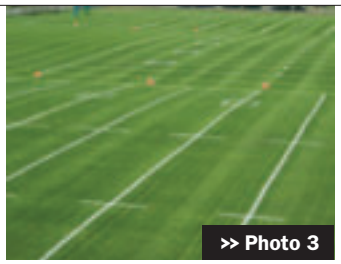
The National Park Service will also make changes to the turf management program. They are hiring a turf manager with extensive experience in managing major events on high traffic natural turf areas similar to our sports fields and will also be developing a turf team. The turf management program will integrate with a new event management program. They will modify the event management program to improve the protection of the turf to the greatest extent possible by implementing rest periods into every permit so that a new event is not set up until after the rest period of the last event.

This is a major undertaking that will take several years to complete all but you had to start somewhere and come spring 2013, the National Mall will have 400,000 square feet of green grass managed by sports turf professionals that understand what high traffic turf needs to survive. ■

Murray Cook is president of Sportsturf Services, a division of The Brickman Group, Columbia, MD, and a past president of the Sports Turf Managers Association.


>> Photo 1


>> Photo 2


>> Photo 3


>> Photo 4


>> Photo 5

Managing natural turf football fields "on a dime"

NOT REALLY, come on, a dime? That title came about as a creative marketing urge hit me—and hopefully it will get you to read this article and not be too upset with the fact that I was able to wring a modicum of money from administration with the volunteer support I was able to round up.

First, a little history to put everything in proper perspective. In 1990, North Dakota State University contracted to have old World War II housing razed and converted into a natural turfgrass field. The contractor came in and did an excellent job of crowning the three fields and hydromulched an excellent blend of athletic field Kentucky bluegrass cultivars. The seeding operation was carried out in late August and by freeze-up and snow cover, a nice mat of green was showing up all over.

The following spring, was another story. The wipe out of the fields was almost complete **(Photo 1)**.

It was at this point I was called in by the athletic director, football coach, and the head of campus landscape coordination, Wayne Larson. After a pretty detailed analysis and lab tests, we determined that the problem was not disease, but seedling juvenility and density. Like any good contractor, they made sure the operation was not going to come up short on seedlings showing up, as payment was contingent on complete coverage. Our North Dakota winters had simply wiped out the overcrowded and juvenile seedlings.

At the flattering request of the AD and coach, I was conscripted into helping to get the field into playable shape by fall semester. Of course, when a distinguished panel of folks like that ask for help, what else can you say but "yes!"

Going to work on literally a non-budget project, and belonging to the North Central Turfgrass Association (NCTGA) at the time, I surveyed the members to see if I could ask for volunteer assistance in getting these fields resurrected. Fortunately, the vendor membership came through with donations of equipment, including a GA 60 core aerator, power rake (slicer), and topdresser with fresh topsoil. Seeding with an athletic field seed mixture (50/50 Kentucky bluegrass cultivars and perennial ryegrass cultivars), irrigation, good mowing practices that alternated the patterns, and keeping the height at 3.5 inches, along with a final touch up with a nitrogen and chelated iron solution tank mixed together, yielded results that everyone was happy with.

The Jacobson tractor athletic field mower **(Photo 2)** was also donated once the grass began to thicken beyond the capabilities of the campus machinery; being a powerful diesel, it made the job easy to do. The soil topdresser was donated by the Fargo Country Club, and I had hourly paid students assisting me at every turn **(Photo 3)**.

Costs incurred were the fertilizers, student labor, striping the fields by landscape grounds personnel, and the grass seed.

The final touch was when Wayne Larson showed up about a week before the first practice sessions were to begin on the field and made his "magic" application of the tank mix of nitrogen and chelated iron. We followed that up with continued strip mowing, and the fields couldn't have looked any better for the first day of practice **(Photo 4)**.

The day the players arrived, the fields were ready for the 300 pound-plus linemen to work on undoing everything I accomplished **(Photo 5)**.

Costs incurred were the fertilizers, student labor, striping the fields by landscape grounds personnel, and the grass seed.

Maintenance of the fields had to be scheduled around the twice a day practice sessions. Mowing was done during their lunch and afternoon breaks, irrigation was carried out during the evening hours, fertilization, overseeding, and repairs when they were on the road for an away game, and continued mowing at the 3+ inch height.

The way to get something done when there is a budget crunch – and I know, when isn't there a budget crunch? Don't be afraid to ask for volunteers (students, Master Gardeners), vendors, and workers as well. Belonging to state and local turfgrass/sports field organizations all helped in achieving this objective of getting the football fields into playable shape. I was fortunate to get the job done, and "employed" myself (as a volunteer) for the following 12 years to take care of these fields. It also involved my wife and two children, and part-time student help. The pay-off was season tickets for all the home games and that's it.

Being required to "root hog, or die" I found myself being more resourceful than ever before in my life, and was very fortunate to have the support of my colleagues in the turfgrass industry, from surrounding golf course superintendents, to grounds keepers at other high schools, and colleges, to the vendors who serve the rank and file in this dynamic industry.

Ron Smith, PhD, is North Dakota State University's Extension Specialist in Horticulture and Turf. ■

Turfgrass breeders' test provides extensive trial data

The Cooperative Turfgrass Breeders Test (CTBT) was founded in the fall of 2004. The objective of the test is to combine resources among cool season turfgrass breeders in order to provide more extensive trial data for potential new cultivars.

The United States is a large geographical area with many diverse climates and microclimates. Because of this it is necessary to obtain as much performance data of potentially new releases (experimental lines) in comparison to existing cultivars as possible. The National Turfgrass Evaluation Program (NTEP) provides an extensive testing system but is cost prohibitive for screening large numbers of genetic resources. Therefore, the CTBT was established in order to facilitate decisions about which experimental cultivars could potentially move forward. A new cultivar with positive performance in the CTBT could be included in the next NTEP trial.

The CTBT has been designed to cover multiple test sites across the US so that researchers may gain information about the scope of adaptation of their experimental cultivars. The CTBT tests are planned to precede the NTEP. This allows the breeder the ability to make an informed choice on what may be included in the NTEP.

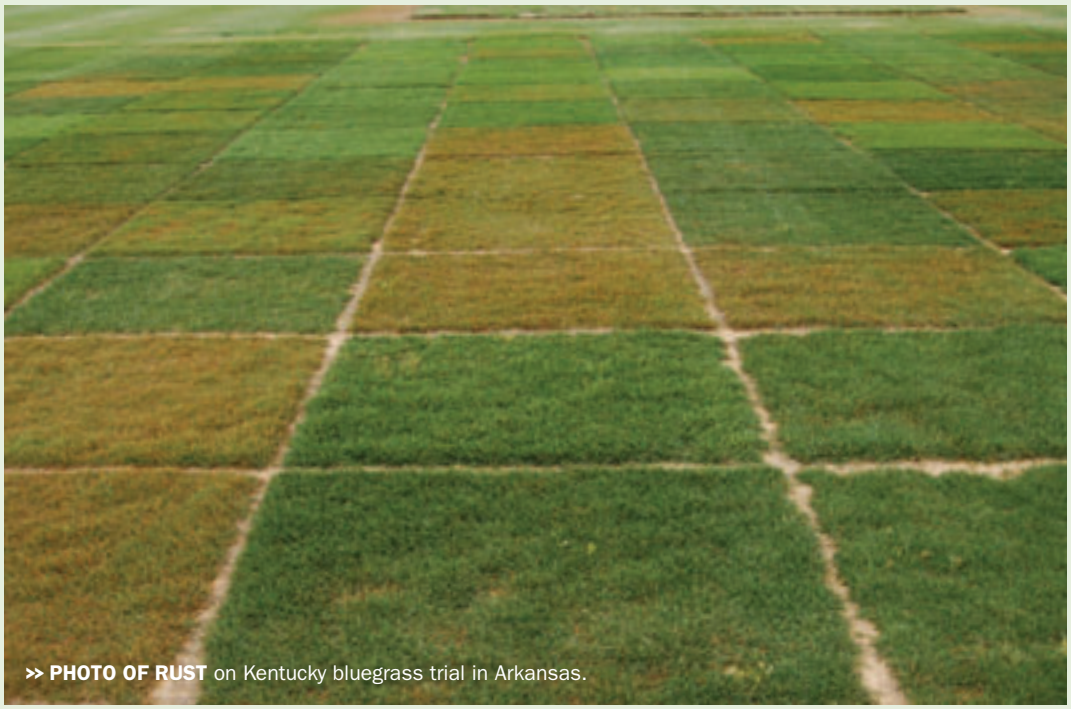
The CTBT consists of six plant breeding programs: DLF International Seeds, Peak Genetics, Pickseed Group, Pure Seed Testing, NexGen Turf Research, and Rutgers University. The plant breeders are responsible for determining number of entries, test schedule, evaluation methods, and selecting the standard test entries.

CTBT tests are initiated, established, maintained and evaluated using standardized testing protocols. Many locations use digital image analysis (DIA) for collection of turf quality data. DIA is very effective at rating percent green cover during periods of drought or disease infestations. Site cooperators collect data on turf quality, color, density and various diseases or insect damage. Depending on the species, data is also collected on drought, wear and shade tolerance. Data is collected for 2 years after sowing. In 2010 a tall fescue test was initiated at 10 locations with 105 entries. The 2011 fine fescue test also has 10 trial locations and 105 entries.

>> **DR. WILLIAM MEYER** rating a shade trial.

There is a great need for cultivars with reduced inputs. These reductions come through better shade, wear and drought tolerance and a reduced growth rate to reduce maintenance costs. Effective evaluation and availability of turf data assists the breeder choosing the best performing cultivars.

Results can also be used to determine if an experimental cultivar is well adapted to a local area or a particular attribute such as shade or drought. The data is analyzed and an annual report is produced and distributed to cooperators and sponsors. Reports for all completed trials are always available on the CTBT web site (www.ctbt-us.info). ■



>> **PHOTO OF RUST** on Kentucky bluegrass trial in Arkansas.