COOL-SEASON BLENDS AND MIXTURES FOR ATHLETIC FIELDS

BY **JOHN STIER, PH.D.**

The best turfs have good environmental stress tolerance and resist weeds and pests while providing a high quality playing surface. The major species useful in cool-season areas are Kentucky bluegrass, perennial ryegrass, and tall fescue. Supina bluegrass is a lesser-known species that can be particularly useful in areas where summer temperatures are usually less than 85 F and irrigation is available. Kentucky bluegrass is desirable because it has excellent cold tolerance, produces a high quality turf, provides good traction and is capable of recovering from traffic due to its rhizomatous growth habit. Perennial ryegrass is desirable because its rapid seed germination is useful for establishing new cover quickly between games and because it has good traffic tolerance. Tall fescue has excellent traffic tolerance and is relatively low maintenance. Both perennial ryegrass and tall fescue are bunch type grasses, which limits their recovery. Supina bluegrass has moderate traffic tolerance but excellent recovery and regrowth from stolons.

Two or more species used together is termed a **mixture**. An example is a Kentucky bluegrass-perennial ryegrass turf. **Blends** are produced when two or more varieties of the same species are used together. Sod producers typically blend at least 3 to 5 varieties of Kentucky bluegrass to produce a marketable sod. Many seed mixtures are actually a mixture of blends: it is common to have a seed mixture composed of two or more Kentucky bluegrass varieties plus two or more perennial ryegrass varieties. In most cases there will be at least 10 percent of a given variety in a seed blend or mixture to ensure a sufficient population of that variety in the resulting turf stand.

Mixtures and blends are used to produce a turf that will maintain acceptable quality under a variety of conditions. Individual species and varieties withstand certain environmental stresses, pests, or diseases better than others do. Since it is impossible to predict all possible stresses, mixtures and blends are planted with the idea that at any given time at least one variety will be thriving to provide an acceptable turf.

In some cases certain varieties or species may be used as "filler" in a seed mix to control costs. Varieties that produce the most seed in production fields often do not produce the best quality turf, but since seed is abundant it is also less expensive. Many of the highest quality turf varieties have low seed yields. Since seed production costs are similar regardless of seed yield, low-yielding varieties are more expensive. Dealers may combine seed from high-yielding varieties with seed from low yielding (and high cost) but high quality varieties to provide a reasonably priced mixture.

Good mixtures and blends don't happen by accident. The best mixtures and blends are based on information ranging from the site conditions to traits of the individual varieties. The best mixtures and blends are likely to be site-specific because local conditions vary. Soil characteristics, type of athletic traffic, and other factors help determine the best mixture or blend. Kentucky bluegrass/perennial ryegrass mixtures are usually the best mixtures for athletic fields in cool-season climates. Mixtures with 2-10 percent supina bluegrass may be desirable if irrigation is available. The high cost of supina bluegrass seed (about $30/lb.) usually prevents it from being seeded as a monostand (single species). Tall fescue/Kentucky bluegrass blends are occasionally used and may be suitable in low maintenance fields.

Individual variety traits are important to consider in a blend. Green color, leaf texture, and seasonal dormancy are important from a visual standpoint. For example, a light green Kentucky bluegrass variety should not be blended with a dark green variety. Varieties with different leaf textures (leaf widths) produce a non-uniform turf. Few tall fescue/Kentucky bluegrass mixtures provide a high quality turf because most tall fescue varieties have coarser leaf texture (wider leaves) than most Kentucky bluegrass varieties.

The vast number of new variety releases each year, plus the diversity in genetic background, means that most mixtures and blends are developed with a case-by-case approach. Two main categories of Kentucky bluegrass exist. Common types are generally those that have not been through extensive breeding programs and perform best in low maintenance situations with low quality expectations. Improved types are varieties developed by turfgrass breeders to have specific traits such as darker color or disease resistance.

Seed mixtures and blends are developed based on seed weight. For example, a 100-lb. bag of a 50/50 mixture of Kentucky bluegrass/perennial ryegrass has 50 percent Kentucky bluegrass and 50 percent perennial ryegrass seed by weight.

That won't be the composition of the turf stand, though. Even though there will be more than five times as many Kentucky bluegrass seeds per pound (due to their small size), perennial ryegrass will dominate the stand. Perennial ryegrass dominates because its rapid germination and establishment crowds out and prevents much of the Kentucky bluegrass seed from developing into plants. If a turf that has approximately 50 percent each of Kentucky bluegrass and perennial ryegrass is desired, the actual seed mix should contain at least 80-85 percent Kentucky bluegrass by weight. ST

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SELECTING TURFGRASS FOR PEST RESISTANCE AND STRESS TOLERANCE

BY **KEVIN N. MORRIS**

The National Turfgrass Evaluation Program (NTEP) tests hundreds of commercially available cultivars and experimental entries of turfgrass annually. Researchers conduct these tests at universities in 40 states and a few Canadian provinces. Data from each year is summarized and published on our website (www.ntep.org) and also in CD format. With data from more than 600 turfgrasses and 20 species published each year and a final report containing a summary of 4-5 years of data at the completion of each trial, the task of selecting the best turfgrass for your situation can be daunting and confusing. Here I will give some suggestions and guidelines on how to locate those cultivars with the best pest resistance and stress tolerance.

First, go to the website and read the disclaimer at the bottom of that page, then click to enter. This will take you to our main page (www.ntep.org/contents2.shtml). To find a grass species, simply click on the link in the yellow box "All NTEP Reports - Select a Turfgrass Species." This is where you will begin the process of identifying pest and stress tolerant grasses.

For these examples, I will be using the most recent Final Report for a species, i.e. summarized data from 4-5 years of a completed trial. Using data from annual progress reports is also useful but remember that the data only represents one growing season and conditions and cultivar performance can and often do vary from one season to another. Also, I will show three different methods you can use to identify pest and stress resistant grasses. That is not to say that these methods are foolproof or the only way to make sensible cultivar decisions. My intention here is to give some guidance on using the data correctly and the statistical values given, but also to make you think about the characteristics that are important in cultivars you want to purchase.

LSD values

Before starting the process, I must explain the statistical information you will need to use and understand (on a very basic level). When reviewing data from any NTEP table, there are two statistical values at the bottom of each column of data. The first, "LSD Value" (Least Significant Difference), is the statistic you will need to use for this exercise. LSD Value is a statistical tool used to determine if the difference in cultivars is real or just happened by chance. To determine if a statistical difference exists among two cultivars, subtract the entry with the smaller value from the entry with the larger value. If the difference between the two numbers is not larger than the LSD Value that is at the bottom of that column, then no statistical difference exists between these two entries for that particular characteristic. For example:

Figure 1. Turfgrass Quality
Entry A 6.0
Entry B 5.5
LSD Value 0.6

Entry A has a mean turfgrass quality rating of 6.0, Entry B has a turfgrass quality rating of 5.5 and the LSD Value is 0.6. In this case, no statistical difference exists between Entry A and B for turfgrass quality. Please keep in mind, however, that you must use this LSD Value for each table and each year as variety performance can vary greatly depending on the location, the trait you are interested in, the month and year.

Now let's continue with three methods of identifying outstanding pest and stress tolerant cultivars:

My first example uses the 1995 National Kentucky Bluegrass Test, 1996-2000 data, which lists cultivar performance based on data from several important diseases, drought, and billbugs. You can list several cultivars of interest, find the data for each of these pests or stresses and determine the cultivars that are in the top statis-

tical grouping (not statistically different from the entry at the top) using the LSD Value. Each cultivar in the top group then gets a "+" for that characteristic. If one of the listed cultivars was not in the top statistical group (for example, "America" and "Apollo" for melting out disease), then that column is left blank for that cultivar. Thus you have a graphic representation of the performance of several cultivars, based on their reaction to several stresses. For you, the end user, you would need to choose the characteristics you feel are important and include those in your table.

In another example, see turfgrass quality ratings from the 1996 National Tall Fescue Test, 1997-2001 data. Here you can compare the entries in the top statistical group under high irrigation (irrigated to prevent stress or dormancy) versus low irrigation (irrigated only during severe drought or no supplemental irrigation) and also drought recovery data collected at two locations. This would document cultivars that have performed well at several locations and under two different irrigation regimes. Under the high irrigation regime, only three cultivars were in the top statistical group. This is due to the high number of locations (18) that will usually result in a lower LSD Value, compared to only four locations for the low irrigation regime (higher LSD Value). For your use, this method may help you identify those entries that will perform equally well under different management regimes.

My final method involves only disease resistance but can be performed using any combination of characteristics. In this example, use 1995-98 data from the 1994 National Perennial Ryegrass Test and choose five important diseases to consider. Then identify the highest-ranking cultivar in the data for each disease and include each (see "Perennial Ryegrass - Disease Reaction"). For instance, "Brightstar II" had the highest rating for leaf spot, "Laredo" had the highest rating for dollar spot, etc. Then using the LSD Value for each column, you can identify those cultivars that had a statistically lower rating than the top entry for each disease. The result is a method to review the disease performance of several top entries and how those grasses react to other diseases. For instance, "Top Gun" and "Achiever" were statistically lower in only one disease (leaf spot), while "Brightstar II," "Laredo," and "Chaparral" were statistically lower in two diseases. This may be important if your goal is best overall disease resistance. However, if leaf spot resistance is your main concern, Brightstar II is statistically better than the other four grasses in this table and may be your best choice.

In summary, there are many ways to interpret cultivar data and I have only presented three here. However, hopefully, this will lead you to investigate further pest and stress resistance of grasses and the best cultivars for your use. ST

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MOBILE TURF MANAGER MASTERS MOLE CRICKETS AND FIRE ANTS

BY **DEBBIE CLAYTON**

Pat White learned the basics of turf maintenance from working on municipal athletic fields and golf courses, but he's applying the same principles to sports stadium maintenance. As assistant general manager of the Mobile BayBears baseball stadium in Mobile, AL, White supervises grounds operations as well as stadium operations for the seven-year-old, 419 Bermudagrass Hank Aaron Stadium.

"I wouldn't be here if the stadium had synthetic turf; I like to grow grass, not push a vacuum cleaner," says White, who also managed maintenance operations for the Birmingham Barons, the BayBears' main rival. "I was hired before the stadium was built and sat in on all construction meetings. It was great because I had input on just about every aspect, from the type of clay used on the infield to where the sprinkler heads are placed."

His intimate knowledge of the stadium infrastructure comes in handy when he needs to locate leaking irrigation valves or pinpoint compaction. The Mobile BayBears facility covers 2.2 acres or 96,000 square feet. The AA team, part of the Southern League, plays 70 regularly scheduled home games between early April and late August.

"If we make the playoffs, the season goes even longer," says White. "We also host high school tournaments and several college games between February and April. Our stadium actually gets a lot of use."

The intense playing schedule leads to one of White's major challenges in maintaining the stadium turf: foot traffic. On any given summer night, some 150 spectators gather in the infield before the game or tramp around on the field during pre-game activities. Combined with the rigors of almost-daily play, foot traffic creates significant compaction.

White's other major challenge is the weather. One of the rainiest cities in the nation, Mobile usually vies with Seattle for most yearly rainfall received. "The rain really hurt us last year," he adds. "It kept the field pretty saturated and we lost quite a bit of turf. When it stays wet like that, the roots don't develop and go deep."

While he can't control the weather, White does try to alleviate compaction. He stepped up his aerification program last summer, aerifying 12 times between April and August.

Other problems White contends with are small but persistent: fire ants and mole crickets. Left uncontrolled, fire ants build mounds on the playing field as well as the berms where spectators gather. "Anyone who lives in the South knows what a nuisance and hazard fire ants are," adds White. "We had to control them or not play ball."

Two years ago, White's Lesco representative suggested he try Chipco's TopChoice insecticide for fire ant control. A granular product based on the active ingredient fipronil, TopChoice is designed to provide control of fire ants for up to one year. He applied the product with a granular spreader and had immediate results.

TopChoice also provided a solution to White's other main insect problem, mole crickets. Present in the area before the field was built, mole crickets started flying as soon as the stadium turned the lights on. Mole crickets are attracted to lights and begin looking for food as soon as they land. They tunnel rapidly just below the soil surface and make trails of pushed-up soil similar to that of a mole, only much smaller.

"Mobile seems to be a hot spot for mole crickets," says White. "Before we got them under control, they tunneled through the turf so much that they weakened the root system. The ground actually crumbled at times when the players ran across it. The situation was potentially hazardous if the players couldn't get their footing."

White was treating up to eight times a year to control mole crickets, using both liquids and baits. He could control the insects for a few weeks, but they kept coming back again. "I was pretty frustrated because nothing worked very well," he says.

"I tried to put it down before the spring hatching," he adds. "It worked so well I didn't see any mole crickets until August. It was highly unusual. Even then, they were just flying in from other areas because of the lights."

Last year, White used TopChoice on the playing field, two berms and the picnic areas, a total of six acres. For the first time, he didn't have to treat again for fire ants and mole crickets the rest of the season. "I definitely will be putting it out every year from now on," says White. "It works so well, I can just relax and not worry about insect problems for a change.

"The problem with baseball is there are too many games," says White. "Bermudagrass needs the summer months to grow, but we're using the field so much that it really gets beaten down. So I try to let it grow and get healthy in the fall, but there's really not enough time. Once I overseed it, there's no telling what will come out in the spring after the ryegrass goes away."

In general, White keeps his Bermudagrass healthy through regular aerification, fertilization, mowing, and pest control. In seven years of use, the playing field has not been renovated, but White plans to accomplish that within the next few years. ST

Debbie Clayton is a free lance writer from Pennsylvania and a board member of the Turf & Ornamental Communicators Association.

PREMIUM BERMUDAGRASS

MS-Choice is the turfgrass featured at Scott Field, the STMA's 2004 Collegiate Football Field of the Year. Mississippi St. developed the Bermudagrass for sports fields, golf fairways and roughs, and schools and parks. It requires less mowing, has excellent wear tolerance, and is great for shaded areas.

Mississippi Sod Producers Association/662-323-3762
For information, circle 056 or
see http://www.oners.ims.ca/2909-056

INJECT LIQUID POLYMERS

American Soil Technologies has an injector machine specifically developed for injecting Nutrimoist L, a liquid-formula cross-linked polymer, into established turf through center-drilled stainless steel knives. The polymer's process of hydration and rehydration continues to deliver moisture and applied nutrients to the root zone for several years.

American Soil Technologies/800-798-7645
For information, circle 055 or
see http://www.oners.ims.ca/2909-055

TURFGRASS VARIETIES

Here are some producers of turfgrass seeds and sod.

Ampac Seed	877-778-7880
Barenbrug USA	541-926-5801
Burlingham Seed	800-236-0296
Cebeco International Seeds	541-369-2251
Cygnet Turf	419-354-1112
Delta Bluegrass	800-637-8873
Environmental Turf	239-774-1293
Georgia Crop Improvement Ass'n	706-542-2351
Greg Norman Turf	813-684-3306
Huber Ranch Sod Nursery	219-552-0552
Jade Run Sod & Turf	302-354-5641
JR Simplot	208-672-2822
John Deere	800-537-8233
Johnston Seed	580-233-5800
LebanonTurf	800-233-0628
Lesco	440-783-9250
Michigan State Seed Solutions	800-647-8873
Newsom Seed	800-553-2719
Northampton County Seed	610-837-6322
Opt-Gro	800-527-9919
Oregon Fine Fescue Commission	503-585-1157
Oregro Seeds	541-491-1001
Pacific Sod	805-986-8277
Patten Seed	770-463-0050
Pennington Seed	706-342-1234
Pickseed West	541-926-8886
S & S Seed	805-684-0436
Scotts	937-644-0011
Sea Isle Growers Ass'n	888-584-6598
Seed Research of Oregon	541-757-2663
Simplot Partners	800-552-8873
Smith Seed	+64 (3) 308 2700
Sod Solutions	843-849-1288
Southern TurfNurseries	800-841-6413
Super Sod Alliance	303-252-1900
Tee-2-Green	503-651-2130
TifSport Growers Ass'n	888-584-6598
Tuckahoe Turf Farms	800-356-2584
Turfgrass America	800-445-2602
Turf Merchants	541-926-8649
TurfOne	541-926-8891
Turf-Seed	800-247-6910
United Hort Supply	303-487-9000
West Coast Turf	760-360-5464

ENGINEERED TURF

BlueYellow is a new turf establishment system that contains a blend of seed and fertilizer in a lightweight, biodegradable roll. It prevents seed migration, fertilizer runoff, and soil erosion, while suppressing weed germination. One-step installation means no calibration and no clean up.

BlueYellow/800-667-3268
For information, circle 061 or
see http://www.oners.ims.ca/2909-061

TRANSITION ZONE BLUEGRASS

Thermal Blue is the first in Scotts' Hybrid Bluegrass series; it tolerates heat better in tall fescue regions of the US and has a finer texture than that grass, says Scotts. Product works with professional maintenance in the south, or with low maintenance in traditional KY blue regions.

The Scotts Co./800-268-2379
For information, circle 057 or
see http://www.oners.ims.ca/2909-057

REDUCED MAINTENANCE BERMUDAGRASS

Celebration is an improved warm-season Bermudagrass from Sod Solutions that offers a combination of dark blue-green color, soft texture, rapid prostrate growth, and reduced mowing requirements. Celebration has excellent drought tolerance, good cold tolerance, and a higher degree of shade tolerance. Adaptable to zones 6b-11.

Sod Solutions, Inc / 843-849-1288
For information, circle 065 or
see http://www.oners.ims.ca/2909-065

SeaDwarf
Seashore Paspalum

BERMUDA ALTERNATIVES

Aloha Seashore Paspalum and SeaDwarf Seashore Paspalum have a fine texture and can be maintained at a wide variety of mowing heights. They tolerate soil compaction and wear, and heal quickly, and require 50 percent less water and 75 percent less nitrogen than Bermudagrass.

Environmental Turf/772-460-5575
For information, circle 082 or
see http://www.oners.ims.ca/2909-082

FESCUE COMBINATION

Winning Colors Plus is a combination of four of the best tall fescues on the market: DaVinci, Rembrandt, Masterpiece, and Picasso with 10 percent Champagne Kentucky bluegrass. Champagne is a quick establishing, aggressive variety that's ideal for sportsturf, golf course rough, or anywhere traffic is an issue.

LebanonTurf/800-532-0090
For information, circle 058 or
see http://www.oners.ims.ca/2909-058

ICON
TURF TYPE
PERENNIAL RYEGRASS

NEW PERENNIAL RYEGRASS

ICON perennial ryegrass is a new fine textured turfgrass variety selected for its improved traffic tolerance, gray leaf spot resistance and deep green color. It has good performance in both cool-season areas and for southern overseeding. ICON germinates fast, is less grainy at short mowing heights, and has a slower vertical growth.

Burlingham Seeds/800-221-7333
For information, circle 060 or
see http://www.oners.ims.ca/2909-060

SEEDED HYBRID ZOYSIAGRASS

Producing Zoysiagrass turf from seed is economical, and requires lower maintenance than most sportsturf. Easily established, Patten Seed's Zenith seed provided the first zoysia turf in World Cup Soccer; it provides superb turf for football, baseball and other sports. Zenith is adapted to the U.S. transition zone and similar climates worldwide.

Patten Seed/770-252-1641
For information, circle 059 or
see http://www.oners.ims.ca/2909-059

FIELDTURF

FieldTurf surfaces have a thickness and density like natural grass. Every FieldTurf surfaces deliver optimal performance in wet or dry conditions and provide the ideal playing conditions all year long. Just ask the Tampa Bay Devil Rays and Montreal Expos.

FieldTurf/800-724-2969
For information, circle 073 or
see http://www.oners.ims.ca/2909-073

NEW, PATENTED TALL FESCUE

Barenbrug has introduced its RTF (rhizomatous tall fescue) turfgrass, which produces a thick rhizome-based root system that self-repairs and fills in damaged bare spots. This is a fescue that doesn't clump, maintains density, and works in the transition zone.

Barenbrug USA/800-547-4101
For information, circle 116 or
see http://www.oners.ims.ca/2909-116

IRRIGATION BASED ON ET

The RME Eagle, RainMaster's new satellite controller, has an automatic or manual ET adjustment, electrical and water-flow alarms, and a programming interface. Adding an optional 2-way communications card transforms the unit into an internet-enabled platform.

RainMaster/805-527-4498
For information, circle 080 or
see http://www.oners.ims.ca/2909-080

COVERMASTER SYSTEM

One of the many field cover models available from Covermaster is RAINCOVER Plus. Test results show that its color combination is the best to reduce heat build-up under the cover, minimizing risk of turf damage. Also available is TARPMATE, a plastic storage roller with safety end caps to prevent handling injury.

Covermaster Inc/800-387-5808
For information, circle 064 or
see http://www.oners.ims.ca/2909-064

MYCORRHIZAL INOCULANTS

BioOrganics, Inc., has a new Landscpe Inoculant product that contains additional types of both Endo and Ecto-type spores, which now number 15 in total. "With mycorrhizae on their roots, nearly all landscaping plants, including turfgrass, can thrive with a small fraction of the fertilizer they are currently being given," says Don Chapman, president of BioOrganics.

BioOrganics/888-332-7676
For information, circle 062 or
see http://www.oners.ims.ca/2909-062

9-VOLT BATTERY ADAPTER

To make maintenance more convenient and cost effective on its IBOC 100/300 Series battery-operated, Irritrol Systems has released a new 9-volt battery adapter/compartment for these valve-mounted devices. These controllers also are ideal for converting existing electric valves to independent battery operation or to replace a solenoid if a broken valve wire cannot be fixed immediately.

Irritrol Systems/909-785-3623
For information, circle 072 or
see http://www.oners.ims.ca/2909-072