ticularly during spring when Kentucky bluegrass is still coming out of winter dormancy. Its bunch type growth habit limits its spreading ability and a clumpy turf can result unless it is routinely overseeded. Perennial ryegrass has an annual root system, so if conditions aren't favorable to root growth during a given year it may have trouble surviving. It is susceptible to a number of diseases, including Pythium blight, brown patch, red thread, Typhula blight, and crown rust. The seed stalks which form in the spring can persist throughout the summer, their thick brown stems suggesting that a problem exists when in fact all is fine. It is not as cold or heat tolerant as Kentucky bluegrass.

Advantages: A fast germination rate of 5 to 7 days makes it the number one choice for overseeding athletic fields. The annual root system may allow it to perform better in compacted soils than Kentucky bluegrass. Its wear tolerance is superior to Kentucky bluegrass. Certain cultivars contain a fungal endophyte which provide resistance to some insects and may enhance turf performance.

Tall fescue

Tall fescue (Festuca arundinacea Schreb.) is another bunch type grass sometimes used on athletic fields. Its germination rate is four to 12 days. Tall fescue will grow across a range of soil types and does well in sandy soils with low fertility. Its deep root system provides tremendous drought tolerance though its water use rate is actually higher than Kentucky bluegrass or perennial ryegrass. It should not be mowed shorter than 1.5 inches. Its tough fibers provide excellent wear tolerance but require sharp mower blades for a clean cut. Tall fescue is one of the coarsest (wide-bladed) cool-season turfgrasses and for this reason it is not often mixed with finer textured turfgrasses such as Kentucky bluegrass. Coarseness was notably a problem with the older cultivars such as Kentucky 31; new cultivars tend to be finer textured. These turf type tall fescues are not as coarse as the older cultivars and include dwarf and semi-dwarf cultivars which are capable of being mowed at shorter heights. Examples include cultivars like 'Bonsai' and 'Rebel Jr'.

Limitations: Like perennial ryegrass, tall fescue requires regular overseeding to maintain a uniform turf. It is particularly susceptible to brown patch disease during summer months and to snow mold in the northern part of its range during the winter. Its cold tolerance is poorer than other cool-season grasses.

Advantages: Tall fescue has perhaps the best heat tolerance of any cool-season grass which makes it ideal for areas close to and within the transition zone. Its wear tolerance is superior to other cool-season grasses though its recuperative ability is rather poor. Its shade tolerance is quite good and management requirements are low. Though irrigation is recommended for optimal performance, it can usually survive fairly well without irrigation or much fertility. For low-budget fields with low expectations, this may well be the grass of choice.

Supina bluegrass

Long used in Germany for athletic fields, supina bluegrass (Poa supina Schrad.) is native to the sub-alpine regions of Europe. Although its wear tolerance is only fair, its recuperative potential is better than any other cool-season grass used for athletic fields. The vigorous stoloniferous (above-ground lateral stems) growth habit allow supina bluegrass to quickly regenerate new leaf tissue following damage and to fill in damaged areas. It is often mixed with other species because of its high seed cost and ability to outcompete other turfgrasses under high traffic conditions.

A thin plant cover is a sure sign of turf stress.

When properly fertilized and irrigated, a seed mixture containing just 5 to10 percent supina bluegrass can provide an almost completely supina bluegrass field in two to three years of heavy traffic. The stoloniferous growth habit provides a dense, uniform turf at heights of 0.5 to 1.5 inches. In the colder areas of the cool-season zone, supina bluegrass may be the best turf for soccer. Its use in North America has been climbing steadily during the past few years.

Limitations: The seed is expensive and few dealers carry it though it can be readily ordered. Its drought tolerance is poor thus it should not be placed in a non-irrigated site. Its lack of heat tolerance restricts its use to areas north of the transition zone. The light green color does not mix well with dark green cultivars of Kentucky bluegrass or perennial ryegrass, causing the turf to have a mottled appearance until supina bluegrass dominates the turf stand. It is susceptible to summer patch, dollar spot, and Microdochium patch. Annual cultivation is needed in non-trafficked areas to prevent excessive thatch formation.

"When blending or especially when mixing, make sure to avoid mismatches in color, leaf texture, or other differences which may affect the appearance or performance of the turf."

Advantages: The rapid lateral growth of supina bluegrass make it ideal for high traffic areas. It seems to have few major disease problems; even the ones listed seldom cause excessive damage. Supina bluegrass is quite tolerant of moist shade and will perform well in stadia where shadows are a concern for turf growth. Its leaf texture is similar to improved types of Kentucky bluegrass and perennial ryegrass, allowing it to be readily mixed with these species, particularly when cultivars of similar color are chosen.

Grasses to avoid

Sometimes fields fail because they were planted to the wrong grass species. Usually someone thought they were "getting a deal" and could save a few dollars. Above all, avoid buying any seed listed as VNS, or "variety not stated." There is no telling what is in the bag or how many and what types of weed seeds are present. Another mistake is to use annual ryegrass (Lolium multiflorum Lam.): this species does not survive for more than one year and replanting will be necessary. The only use for annual ryegrass is to hold the soil in place while an area is being constructed.

A common mistake is the use of fine fescues (creeping red, Chewings, and hard) in athletic fields. Fine fescues (F. rubra, F. rubra L. spp. commutata Gaud., and F. longifolia Thuill.) should never be used on athletic fields even if the seed is free. All have poor traffic tolerance and recuperative capabilities, and many go dormant during the summer. Rough bluegrass (P. trivialis) should not be used for the same reasons. Bentgrasses (Agrostis spp.) also do not tolerate traffic and require much more intensive management than available on most athletic turfs (the exceptions are bowling greens or croquet courts). Bermudagrass (Cynodon spp.) and zoysiagrass (Zoysia spp.) are occasionally tried in cool-season areas because both grasses are noted for their wear tolerance. While they do have exceptional wear tolerance, both are warm-season

grasses and have no place in athletic fields north of the transition zone.

Mixtures and blends

Mixtures and blends are used to give a turf the best possible combination of pest, disease, and stress tolerance while providing an acceptable playing surface. Mixtures are composed of two or more grass species. An example is an 85 percent Kentucky bluegrass, 15 percent perennial ryegrass mixture.

When two or more cultivars of the same species are together in a seed lot, the result is called a blend. Most fields are planted to a mixture containing blends of two or more cultivars of each species. When blending or especially when mixing, make sure to avoid mismatches in color, leaf texture, or other differences which may affect the appearance or performance of the turf.

A common mistake is to use too much perennial ryegrass in a mixture with Kentucky bluegrass. Because perennial ryegrass has such a quick establishment rate, a 50:50 seed mixture with Kentucky bluegrass will produce a turf which is nearly all perennial ryegrass. A good rule of thumb is to use no more than 15-20% perennial ryegrass in the seed mixture if a turf stand composed more or less equally of both species is desired. One of the benefits of Kentucky bluegrass is the stability it provides to the turf because of its rhizomes. When fields are constantly overseeded with perennial ryegrass, the Kentucky bluegrass component can become insignificant, especially in high traffic areas where stability is especially important. Tall fescue is usually planted as a blend and is seldom mixed with other species due to its coarser leaf texture.

Seeding rates will depend on the ultimate percentage of each in a mixture. Small seeded Poa species are seeded at 1-2 lbs./M while large seeded species such as perennial ryegrass are seeded at 7-9 lbs./M. Ask your seed supplier for the proper seeding rate for a given mixture.

Further information

Additional information on suitable grass species and cultivars is often available through your local county extension agent or a university turfgrass extension specialist. Reputable seed dealers and other turf suppliers can also provide good recommendations, but be wary of biased information. The National Turfgrass Evaluation Program (NTEP) is another source of information on cultivar performance for many grass species. Performance data are collected by university specialists across the country and published by NTEP annually. NTEP data are accessible at http://www.ntep.org. The site is free and no passwords are needed.

John Stier is an assistant professor in the Horticulture Department of the University of Wisconsin. He is an active member of the STMA and the Wisconsin Chapter. Contact Dr. Stier via e-mail at jstier@facstaff.wisc.edu.

The Key to Success–Quality Athletic Turf

by Floyd Perry

Football season is back in full swing. The coaches are ready, the physicals have been completed, the equipment and the uniforms have been ordered and have arrived and the footballs are pumped up. What's left? Let's go get 'em!

That's the theme in all 50 states this fall, but something's missing in this equation: What about the athletic turf? Has anyone even been remotely concerned about its condition since last season? Has anyone ordered, spread and nurtured the seeding, fertilizing and top dressing for a quality and safe playing season?

The grounds personnel have their own football agenda to work with and, needless to say, it's not as glamorous as the football coach. In fact, when it comes time to order supplies and materials and rent equipment, it's like pulling teeth, and sometimes administrators aren't so willing to act immediately upon the request then it would be to repair shoulder pads.

Isn't it interesting that 90 percent of the football season preparation goes into coaches clinics to locate new X and O formations, weight room schedules to bulk up player physiques, purchase orders to create new color designs for the old Blue and Gold and very little mention or attention to the care and maintenance where 60 to 100 cleat bearing, turf-ripping folks will be located for three hours a day for the next four months. Isn't that interesting?

Turf grows by the inch and is killed by the foot. There haven't been truer words spoken, but sometimes its value falls on deaf ears.

Let's evaluate some philosophical concerns that can create some positive effects on our football turf and make the coach and team look like winners even before the first game.

Institution Philosophy

The climate for better and safer athletic facilities is changing on all levels. In my travels across the country

(over 1,500 facilities viewed) I have experienced a complete metamorphosis in attitudes involving athletic/football/soccer fields: Gates are locked after school hours; permission slips and liability waivers are necessary to use the fields by outside groups due to the occurrence of law suits; and an internal group scheduling regulates the amount of weekly traffic.

Here's a sample schedule for a combination football/soccer game field.

1. Football team-two hours a week on Thursday before Friday's game.
2. Band-two hours a week on Wednesday night for formation alignments.
3. Soccer-two hours a week primarily to work on patterns, no drill work.
4. Avoidance of outside institution activities during the key institution season: concerts, art shows, fairs, etc.

Keep in mind these procedures were not put into place overnight, but became policy after a serious injury lawsuit on an inadequately maintained facility. Also this institution had the foresight to create sufficient practice areas for the individual activities including their physical education program.

Rotation or split-field usage

Some institutions are closed down and completely renovated. This allows the community to always start the Pop Warner football/youth soccer/intramurals on quality turf and creates a strong confidence factor with the parents and taxpayers.

The more practical way to create safe athletic turf, since field rotation is not practical in many locations, is cross-field design. For example, you could divide your main field into two opposite length fields and avoid center play. Outstanding facility managers got this idea from the design of inside basketball courts with side baskets and different colored lines.

If the coaches and field personnel work together creating quality turf by moving their workouts around and shifting their heavy work to the end zones or sidelines they would have a better chance of keeping a strong biomass of turf for their big ball games.

Year round calendar

As coaches, teachers and administrators, we create a 365-day plan for our individual teams or students; the athletic facility manager must begin to create their plans and communicate them to the administration for support. The perception of the turf manager/groundskeeper must change because more pressure is being placed on our outside facilities daily. One other big problem that creates major concern on our fields is Mother Nature. Do we have policies in place for rainouts or cancellations? Do we have a policy providing that teams cannot practice if the moisture level is too concentrated in our heavy clay sub-soils? Or do we just go ahead and destroy whatever has been achieved through hard work and preparation?

continued on page 37

Surviving Special Events

by L. Murray Cook

Everyone in our industry has experienced some type of extracurricular event on their field that has caused them to be somewhat agitated because it is not the natural activity of the venue. These activities have been given the name "special" events. Over the years I have had the privilege and sadness of managing special events on many different venues.

My first taste of special-event management was in 1976, the bicentennial year of our country. As head groundskeeper of the Salem Pirates Baseball Club, a Class A affiliate of the Pittsburgh Pirates, I was forced to allow log cabins to be constructed on the field. The event was successful (so they say) and the nails I picked off the field over the next few years were a constant remainder of how I disliked special events.

The entire special-event concept boils down to money. Facilities are forced to generate revenues to pay athletes and debt from new facility construction. Face it, without the stadium you may need to seek other employment opportunities if ownership does not turn a profit (regardless of how great the field looks). There are stadiums that generate profits from special events that line the pockets of owners and there are events that break even.

In the stadium game, the "sport specific field concept" enables developers and owners to capture funding to build the facility. This is wonderful until they sign John "Over the Hill" Smith for $2.5 billion and they need to generate additional revenue to cover his salary. Even on the municipal level you have the sport specific youth fields for baseball being booked for softball games and miniature soccer events.

There are several options available to the city governments and facilities that plan or need to go down the path of increasing events at a facility.

"Based on the field size and location you should break down the facility in "tasks" that will allow you to create standard operating procedures."

Planning

The key to the development of a multi-use facility is planning. First and foremost you must determine the venue usage. Coordinate the key players and champions of the plan objectives, then determine the following goals of the facility:

* Who is going to use it?
* Community use, collegiate use or professional use-or all of the above?
* Which sports will be the anchor for the venue?
* What are the capacities of the stadium/building? Seating? Parking?
* Are you phasing or planning for growth? Year-round usage?
* Clinics? Camps? Tournaments? Concerts? Tractor pulls?
* Is there a budget?
* Site issues and location?

Once you have determined the

continued on page 36

AMETEK® ACCESS BOXES
http://www.ametekwater.com

GEO-BOY
http://www.geo-boy.com

JARRAFF Industries, Inc.
http://www.jarraff.com

Tanaka
http://www.tanakapowerequipment.com

Aqua Master FOUNTAINS AND AERATORS
http://www.aquamasterfountains.com

HEFTEE Manufactured by McCANSE ENGINEERING, LLC
http://www.heftee.com

JOHN DEERE
http://www.deere.com

Thompson
IRRIGATION EQUIPMENT SINCE 1907
http://www.utirrigation.com

AQUASCAPE DESIGNS, INC.
http://www.aquascapedesigns.com

HOT BOX.
http://www.hot-box.com

K RAIN
http://www.k-rain.com

TRANSAMERICA DISTRIBUTION FINANCE
http://www.transamerica.com

BLUEBIRD EASYSCAPE
http://www.bluebird.com

Hunter®
http://www.hunterindustries.com


Marvin Pruners & Saws
http://www.pruner.com

Vermeer
http://www.vermeer.com

DIG
http://www.digcorp.com/asdig

Husqvarna
http://www.husqvarna.com

NETAFIM USA PRECISION IRRIGATION
http://www.netafim-usa.com

W.E. CHAPPS
W.E. can help you out it!
http://www.wechapps.com

Ditch Witch The Underground Authority WORLDWIDE
http://www.ditchwitch.com

Irrigation Station
http://www.irrigationstation.com

PLANT HEALTH CARE, INC.
http://www.planthealthcare.com

WEST COAST TURF
http://www.westcoastturf.com

EROSION CONTROL TECHNOLOGIES
http://www.erosioncontroltech.com

EWING IRRIGATION PRODUCTS
http://www.ewing1.com

Irrigation Supply, Inc.
http://www.irrigationsupply.com

rotary
http://www.rotarycorp.com

Weather Matic
http://www.weathermatic.com

Equipment Focus

John Deere

Wide-Area 1620 Wide Area Flex Mower

* 51-hp, 4-cycle diesel engine
* Full-time or on-demand 4-wheel drive for excellent traction
* 96-inch cutting width lets you cover large open areas
* One-deck setup provides excellent visibility with 30-inch trim-side overhang, extra trimming ability, and an overall well-balanced machine
* Hydraulically-driven mower deck delivers smooth power and allows free flotation along ground contour
* Hi/low range lets you mow at speeds up to 8.5 mph; transport speeds up to 14.5 mph
* Tilt-steering column increases operating comfort

For more information circle 200.

Bush Hog

Three-Gang Reel Mower

* Bush Hog's Reel Mowers provide the consistent quality cut of reel mowers at a fraction of the cost of self-contained units
* Reels can be operated behind tractors with minimal horsepower
* Requires only 19 to 30 horsepower
* provides 3/8 to 3-1/4 inch mowing heights and cutting width of 83, 138 and 192 inches
* Mowers carry a two-year limited warranty against defects in material and workmanship, including the belts
* Reels carry a lifetime warranty against bending and breaking Selection of four to nine blade reels are available
* The heavy-duty rollers have wear points that are durable, greaseable and replaceable.
* Features heavy-duty gearbox, plated jackshafts to reduce rust, cast hubs on tires and wheels, easy to replace blades, tires that can be changed easily without removing reels and V-belt guard that can be removed without removing the head

For more information circle 202.

Hustler Excel Industries

Hydraulic Range Wing

* The lowest-priced wide area mower on the market
* The simplicity of hydraulic drive
* PTO drive to front deck
* True zero-degree turning maneuverability
* Over 12-foot cutting width
* Mow more than 60 acres per 8-hour day
* Mow at 20 degrees above or below horizontal
* Convert to winter attachments for year-round use.

For more information circle 203.

Toro

Groundmaster 3500-D Rotary Mower

* Full roller behind each deck to provide field striping patterns
* Independent, full floating 27-inch decks provide excellent cutting performance with a 68-inch width of cut
* Optional 72-inch cut for less undulating turf, such as sports fields
* Cutting system slides decks 12 inches left or right of center (24 inch full travel) to achieve varied tire tracking with the same field patterns
* Powered by a Kubota 35-horsepower turbo-charged, liquid-cooled, three cylinder diesel engine.
* Three-wheel drive traction system provides traction by supplying power to two of the three wheels at all times.
* Power steering, tilt steering, adjustable seat and easy to use controls.

For more information circle 201.

Woods Equipment Co.

Batwing 3180 Series 3 Cutter

* Heavy-duty 15-foot flexible wing rotary cutter offers exceptional cutting performance
* Features bottom side, heavy gauge, high strength steel box frame construction
* Top deck sheds water and debris, preventing corrosion
* Gearbox shield redesigned into one piece that flips up intact for easy maintenance.
* Deck protection plates prevent deck damage from a bent blade
* Constant Velocity input driveline is upgraded to Category 6 Heavy, the highest in the industry
* One-piece ductile iron spring-loaded wheel arm increases durability
* Other features include a 180-inch cutting width and a blade tip speed of 16,000 feet per minute

For more information circle 204.