

removing the 4-inch heavy organic layer, it would increase drainage capacity and air movement and reduce the compaction potential. The original pitch also had stability fibers mixed into the soil profile, but with the existing 4-inch layer, those fibers were not being used. By removing the layer, the grass roots would be able to wrap around those fibers to give the pitch a more durable playing surface, allowing it to handle more traffic.

Removing the inherited *Poa* infestation would make the field more aesthetically pleasing and be able to sustain more traffic. It would also reduce the stress tolerance of the pitch and the water use. Not only would the pitch use fewer pesticides, but would also be less susceptible to winter injury.

The third reason for the renovation was to return the field to its original grade, which is essential for a successful pitch. Due to the inconsistent grade, there were major drainage issues, such as puddling and unhealthy turf. Getting back to the original grade would allow for an ideal drainage pattern, allowing the water to move smoothly across the surface grade and to filter into the soil.

After the issues of the existing pitch were determined, the problem solving stage came next. Would there be a full renovation to cut out the existing field and replace it, or would there be gradual amendments used, such as core aeration, topdressing and overseeding? Because the organic layer was too large and the *Poa* infestation was too severe to reduce without the use of chemical control, the gradual amendment option was thrown out.

When deciding to go with a full renovation there were two options, sod or seed. Below is a chart of the factors that went into determining whether we should seed or sod the pitch:

European influence also had an impact on the decision making process. Many premier pitches in Europe renovate annually and are considered to be some of the best in the world. They are all almost exclusively done with seed. When our crew talked to a European field expert, he asked us, "Why would we sod when we had this open window of time to seed?" Seeding is the "norm" across the pond, and they simply could not understand why we debated between the two.

Not only were we looking at all options, but we also wanted to challenge ourselves in the whole process. The general consensus was that we had to sod. We heard doubt from all angles when we proposed growing a stable Kentucky bluegrass stand and prepare it for use in just 35 days. Our different ways of thinking pushed us past the "norm," and our crew began to think that this would be a great opportunity to push the envelope and test the newest grass genetic technologies out there.

Factors	Seed	Sod
Cost (approximate)	Ft ² =\$17.77 Total Seed Cost=\$1,600	Ft ² =\$833.33 Sod/Trucking =\$60,000 Sod Install=\$\$15,000 Total Sod Cost=\$75,000
Timeline	Variable grow-in times Newer seed technologies boast faster germination and establishment	"Quick Fix" Playable in 1-2 weeks
Layer Issue	No layer created from immediate seed-to-soil contact	Virtually impossible to match sand of the sod to the sand of your existing profile Creates inevitable layering problems, drainage and air exchange issues

Growth Chart

Renovation Process	
1. Cut out existing field	8. Roll second time
2. Topdress 3/4" 100% sand	9. Initial granular fertilizer
3. Laser Grade	10. Topdress 1/4" (85% sand 15% peat)
4. Recycle Dress	11. Apply paper mulch
5. Mesh Drag	12. Water
6. Roll	13. Foliar fertilize
7. Seed	14. Mowing

Revovation Process Chart

The final decision was to go ahead and seed the field because using the European-style renovation that many top-level clubs have used interested us. There was also an up-front savings that was too large to ignore, and growing from seed would eliminate any potential sod layer. Choosing this option defied the perception that seeding could not be done. A 35-day grow-in was achievable with the new grass genetics, and it would also challenge us professionally. When deciding to seed, the renovation process was then planned out completely.

The existing field was cut out on the first pass at a 2-inch depth. This removed the top 2 inches of the sod layer. After the first initial cut out was done, the second pass was started, removing the remaining organic layer and exposing the original sand/stability fiber mix.

Using a Speedresser, the pitch was topdressed with 3/4-inch with USGA spec 100% sand. The pitch was then laser graded, which removed all accumulated material and exposed the original grade.

Once the laser grading was complete, a recycling dresser was used to incorporate the new 100% sand with the existing sand, which contained the fiber mix. This process refreshed the existing sand with the new material and combined the new sand with the fibers.

A mesh drag was then used to break up the clumps and bunches of soil and fibers. Following that, a three-ton double-drum roller was used on the pitch. By doing this, we created a stable base for the seeding and topdressing equipment.



▲ These photos were taken on day 8 of the process. The picture on the left was taken at 10 am; after that photo, a package of biostimulants was applied to the field. The picture on the right was taken at 2 pm of that same day.

Next came the most important part of the renovation, seeding. All seed that was applied had a Germinex seed coating powder. Three separate varieties of Kentucky bluegrass were used at 5 lb/M. The new genetics in Kentucky bluegrass allows for rapid germination, aggressiveness, disease tolerance, and early spring green-up. The seed was applied with a tractor-mounted dimple seeder. Because of a heavy rainstorm that was going to hit the Maryland area later in the week, a new variety of Perennial ryegrass was applied to the pitch with a rotary walk-behind spreader at 1 lb/M. This was applied because of its quick germination and stolon production, which accelerated stabilization.

The pitch was then ready for the second roll using the same three-ton double-drum roller as before. When seeding, the dim-

ple seeder loosened the soil when it created the seedbed. By rolling, it stabilized the material and promoted maximum seed-to-soil contact. Seed-to-soil contact is the key to a fast, successful grow-in.

As soon as the field was cut off, a soil test was conducted. We wanted to make sure that we kept our fertilization program simple and gave the plant exactly what it needed.

The first granular fertilizer

application was on the first sign of germination. A 19-0-19 50% slow release was applied for the plant to have a base and equal ratio of nitrogen (N) and potassium (K). We also wanted the roots to have a consistent diet. On day 5 after germination, an 18-24-12 was applied to add phosphorus (P) to promote root growth. On day 10, another soil test was taken because of the amount of water that had been put on the pitch to promote seed germination. This test showed that the pitch was still lacking P and was deficient in magnesium (Mg), so on day 14, Crystal Green 5-28-0 10% Mg was applied. On day 21, a 19-0-19 50% slow release was applied.

The second topdressing pass consisted of $\frac{3}{4}$ -inch 85% sand and 15% peat mix. Using the small amount of peat helped to hold moisture for the seed to germinate and establish.

▼ 10 weeks after seeding for ACC Men's Championship Game.



Paper-based biodegradable mulch was then put out over the pitch by using a topdresser. This was used because the area was anticipating a heavy rainfall event. This material aided in preventing seed from washing away.

Initially, the water program was very heavy. The water needed to “set-in” the profile and break the seed coat, which also promotes germination of the seed. After the initial germination, there were continual cycles of water, keeping seed moist through the germination and establishment process. Gradually the water was backed off, forcing the plant to push roots.

Foliar fertilization allowed us to give the plant what it needed at the exact moment in time. A package of biostimulants that was prescribed specifically for each growth stage was applied. Biostimulants are organic products (plant hormones, carbohydrates, amino acids, and anti-oxidants) that assist the plant in the respiration and photosynthesis process. By using these hormones, the pitch could be grown in an efficient, healthy way. If only N was mostly used, the shoot growth would have been pushed. We were more concentrated on root mass/growth and strong cell walls to aid the plant to withstand heavy traffic.

During post-germination, the pitch was sprayed on a 4-day cycle. This provided the plant with what it needed, without expending the energy to create it. The package of biostimulants was to acclimate the plant and to make it wake up. This is equivalent to humans waking up and drinking a cup of coffee in the morning, or taking daily vitamins.

The first cut of the pitch was 20 days after seeding with a Denis Pedestrian mower until day 30, when a triplex mower replaced it. We cut the pitch every 2-3 days at 1 inch and then worked our way down to 9/16 inch where the height stayed the rest of the 2012 and 2013 season. This height was maintained to force the plant to grow sideways.

It was evident after 20 days with the amount of growth and density already visible on the pitch, that a 35-day grow-in was possible. With great seedbed preparation, water use, consistent mowing, and a foliar fertilization plan that was focused on healthy plant growth and root development, a playable, dense and tight playing surface was on its way to being fully developed. This process not only made us learn about new technologies in our industry, but it also taught us that going against the “norm” can lead to an outcome that could change our way of thinking forever. Like all projects and renovations, we learned many lessons. Looking back, there are two things that we would do differently, if the pitch were to be renovated to this extent again. The pitch would not have had the Perennial ryegrass spread out. The Kentucky bluegrass would have withstood the rainstorm that we had expected that week. It also would have received a second topdressing that consisted of 100% sand instead of the ¾-inch mixture of 85% sand and 15% peat mix. By mixing in the 15% peat, a minor layer was created on the pitch. To fix this problem, the stadium pitch was fraze mowed at ¼ inch in the fall of 2013 after withstanding 167 events in 6 months.

In the past two years, our industry has had new technology and new grass genetics introduced. Because of this, seeding is possible! Thinking outside the box can turn impossibility into possibility. Thanks to using new technologies, plant feeding, and

soil stabilization, 11 weeks after seeding, the Maureen Hendricks Field held 20 events in 14 days, including the ACC Men’s Soccer Championships.

Each season and field provides new lessons to all of us, but with creative thinking, extensive research, and trial and error, all problems can be solved. It is important to keep an open line of communication with directors, players, and coaches, which will allow everyone to be comfortable with the renovation at hand. Most importantly, it helps to have a positive mindset through the good and the bad. You must believe in what you are doing because if you don’t, why should anyone else? If a problem arises, learn from it and move on in order to fix that problem. It is so important to meet old challenges with new creative and energized attitudes.

M.C. Escher once said, “Only those who attempt the absurd, will achieve the impossible.” It is up to each and every one of us to continue to improve fields and open the minds of others to the idea that grass fields can and will take more traffic. ■

Presented at the 2014 STMA by Julie Adamski, director of retail and professional development for Sod Solutions, Inc., and Ryan Bjorn, director of grounds and environmental management at the Maryland SoccerPlex..

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POST-EMERGENT HERBICIDE Q&A

Cor an overview of post-emergence weed control, including herbicide selection and overall application strategies *SportsTurf* recently sought the insights of Ken Hutto, technical service manager at FMC Professional Solutions.

SportsTurf: Have there been noticeable changes in post-emergent control results since MSMA was banned?

Hutto: MSMA was a valuable tool for postemergence weed control. It provided effective control of annual and perennial grass weeds, but could also be used for nutsedge, kyllinga, and certain broadleaf weeds.

The biggest void created when MSMA restrictions were issued was getting effective postemergence perennial grass control, most notably of dallisgrass. Since then, controlling dallisgrass has changed dramatically, not only because of the products now available, but because of when those products are applied. MSMA was solely used in the summer months, but some of the newer products are recommended for use in the fall and early summer for effective dallisgrass control. It is a change in application philosophy.

SportsTurf: Please share your general post-emergent herbicide strategies for cool-season and warm-season athletic turf.

Hutto: Establishing a competitive turf is a must for successful long-term weed control. A close second is correct weed identification. What looks like crabgrass may not be crabgrass! Many grasses without a seedhead look like crabgrass. If you do not know what you are dealing with, how will you know what products are most effective?

Not all grass herbicides control all grasses. Likewise, some broadleaf weed materials will control prostrate knotweed better than others. In general, postemergence herbicides are most effective when the target weeds are in young growth stages. Depending on the sport, turf type and weed, sports turf managers may not be able to make postemergence treatments during this life cycle stage due to play. If possible, delay mowing events one day on each

side of the application to ensure maximum herbicide absorption into the target weed.

Resistant weeds are becoming more and more prevalent, so rotating modes-of-action is important if other options are labeled for use in the desired turf. When interseeding, be aware of seeding restrictions on herbicide labels, as some postemergence herbicides may negatively impact new seedling establishment if applied too early in seedling development.

Lastly, don't forget about cultural practices! Aerifying high traffic areas to alleviate compacted areas will aid in reducing environments conducive to goosegrass.

SportsTurf: Are there different products and/or strategies for post-emergence control of grassy weeds and broadleaf weeds?

Hutto: There are probably more broadleaf weed herbicide options than grass herbicide options. Choosing the right post-emergence herbicide will depend upon what weed spectrum you are dealing with.

Your most common three-way postemergence broadleaf weed herbicides can be used in most cool and warm-season turf and can be very effective. However, having such a wide range of turf tolerance is not always the case for postemergence grass herbicides.

For example, Solitare herbicide can be used for postemergence crabgrass, broadleaf, and nutsedge control in both cool and warm-season turf. Some sulfonylurea herbicides can be used for goosegrass control, but only in warm-season turf. Some of the newer "bleaching" herbicides are primarily labeled for cool-season turfgrass use.

Understanding your weed spectrum and what products are available for use in your specific turfgrass will be a big part in developing an effective weed-control strategy.

SportsTurf: Are there any new post-emergent herbicides near market that you can discuss?

Hutto: FMC is always working diligently to bring the next customer driven innovation to market. Our goal is to help turfgrass managers be more efficient in their weed-control programs. ■

Hutto joined FMC in 2007. He received a Bachelor of Science degree in Microbiology from Auburn University and Master of Science and Doctorate degrees in Weed Science specializing in Turfgrass Weed Management from Mississippi State University. After receiving his PhD, he worked at the University of Florida as a post-doctoral research associate at the West Florida Research and Education Center, conducting research in turfgrass science.

◀ Ken Hutto, PhD



POST-EMERGENT HERBICIDE Q&A

For an overview of post-emergence weed control, including herbicide selection and overall application strategies *SportsTurf* recently sought the insights of Dean Mosdell, PhD, field technical manager — west, at Syngenta Lawn & Garden.

SportsTurf: Have there been noticeable changes in post-emergence control results since MSMA was banned?

Mosdell: Weed control strategies have changed slightly. MSMA provided an inexpensive solution for many monocot weeds. Strategies may have greater emphasis on making pre-emergence more effective, such as timing or split/multiple applications. There are several post-emergence herbicides available for warm and cool-season turf, but are narrow in spectrum and/or safety on various turf species. The biggest gap in weed control without MSMA is dallisgrass control in cool-season turf.

SportsTurf: Please share your general post-emergent herbicide strategies for cool-season and warm-season athletic turf.

Mosdell: Selection is based on weeds present and turf type. Any strategy would need to consider turf type, weed targets and best timing for weed control that works into the use schedule and maintenance program of the athletic field.

SportsTurf: In general, what is the best strategy for post-emergence weed control?

Mosdell: Again, strategy would be based on weeds present and turf type. Dicot weeds can be controlled with pre-mixes of growth-regulating-type herbicides such as 2,4-D, dicamba, triclopyr, MCPA and others. There are numerous mixes that vary in ratios and components of these herbicides to improve the safety on certain turf types. There are fewer options to control grass weeds post-emergence. The most common summer annual grass is crabgrass. Options for control include products that contain quinclorac, or Tenacity and Acclaim herbicides. On warm-season turf, other options include ALS-inhibiting herbicides such as Monument or pre-mixes of several of these ALS herbicides. Older triazine chemistry is still used on warm-season turfgrasses. It's important to read the label for safety on turf species as they vary widely and mixtures may further reduce labeled turf species.

SportsTurf: Are there different products and/or strategies for post-emergence control of grassy weeds and broadleaf weeds?

Mosdell: Yes, with few exceptions most post-emergence her-

bicides are effective on either dicots or monocot weed species. Tenacity herbicide, with pre- and post-emergence activity, will control crabgrass as well as dandelion, oxalis and speedwells. In the herbicide screening process it is difficult to select for a broad spectrum grass herbicide to control a grass weed in turfgrasses since their physiology is similar. An effective strategy is to use a pre-emergence herbicide and treat any escapes of grass weeds with a post-emergence. There are many effective post-emergence herbicides to control dicot weeds. Best strategy is to maintain a healthy turf stand and control any dicot weeds that pop-up with a broadleaf herbicide. There are many to choose from depending on weed species and turf type.

» I think in the near term there will be mixtures of post-emergence herbicides, similar to the broadleaf herbicide products, to improve spectrum, efficacy and turf safety. With the loss of MSMA in several markets, opportunities exist for new post-emergence grass herbicides.

SportsTurf: Are there any new post-emergent herbicides near market that you can discuss?

Mosdell: I think in the near term there will be mixtures of post-emergence herbicides, similar to the broadleaf herbicide products, to improve spectrum, efficacy and turf safety. With the loss of MSMA in several markets, opportunities exist for new post-emergence grass herbicides. ■

Dean Mosdell, Ph.D. is field technical manager <dash> west, for the Syngenta Lawn & Garden. His responsibilities include product stewardship, field testing and technical support of Syngenta products in turf markets for the western United States. Mosdell has more than 25 years of experience in developing plant growth regulating products for application on turfgrasses, including the introduction of the first PGR for fine turf. He holds both a BS and an MS degree in Agronomy (Turfgrass Specialty), from Virginia Tech in Blacksburg, Va., and a Ph.D from Purdue University in West Lafayette, Ind.

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RISK MANAGEMENT

Limiting liability for your sports facility

There are a lot of reasons to love a great stadium—your favorite team plays there, the seats have great views, it's the home of fond memories. Maybe it just has the best sushi in town. But when you run a sports venue, it's the less glamorous issues that keep you up at night: like how to limit the facility's liability. Because if you don't keep your facility safe and your liability limited, the results can be catastrophic.

WAIT, WHAT'S LIABILITY?

Put simply, liability is the risk that your organization will be sued for injuries (or property damage) that occur at your facility. You can never entirely eliminate liability, because some disasters simply aren't foreseeable. But if you make your facility as safe as possible, obtain waivers, and purchase liability insurance, you can dramatically reduce your risk.

SAFETY

Operating a safe sporting facility is the first step in limiting your liability. The primary reason why prioritizing safety will limit liability is that in order for players or visitors to win a lawsuit against the facility, they must first show that they or their property were harmed. If there's no injury, there's no basis for a lawsuit.

Even if something goes wrong and someone is injured, facilities that have done everything in their power to ensure that visitors are safe will be exposed to less liability. That's because venues can generally be held liable for injuries that result from situations that they knew or should have known were dangerous. If you know something is dangerous, you are obligated to mitigate that risk.

ON THE FIELD

Take, for example, a football field. If you place a wall too close to the end zone, it's reasonable to expect that a player may accidentally run in to it and injure himself. When the wall is already in place, it can be tempting to ignore the potential risk. But if a player does get hurt, he will have a strong claim that you were negligent because you should have anticipated how dangerous the wall was. It's far better to be cautious and attempt to mitigate the risk by padding (or even removing) the wall.

Another common source of injuries in facilities that cater to children, students, and community athletes are unanchored soccer goals. Weighting the bases of goals may be enough to keep them in place during most games. But when the game is over, and people are using the field for everything from Frisbee games to tailgates, unsecured goals can become hazardous. Over the last 50 years, close 100 people have been killed or seriously injured as a result of soccer goals falling on them. Many of those people may have been reckless—maybe they were hanging from the goal or attempting to climb it. But as a facility manager, you are expected to anticipate that people will do risky things, and you're expected to take precautions to limit the possibility that they will be injured.

Finally, it's important to remember that you need to be just as conscientious about maintaining safe practice facilities as you are about the primary field or court. Injuries that happen during practices (and the resulting suits) can be just as catastrophic as those that happen during the big game.

AND OFF THE FIELD

Facilities also need to minimize the risk to spectators. Visitors often sue for injuries wholly unrelated to the main sporting event, from slip-and-fall

cases, to injuries they sustain from other fans. Here, again, the best way to avoid a lawsuit is by preventing people from getting injured. That can mean trying to keep the floors dry (many venues sale all their drinks in oversize cups or cans to limit spilling). But it can also mean making sure you have adequate security to prevent spectators from getting into fights.

Put simply, if you run your facility well and take reasonable precautions to ensure that patrons are safe, you will not only minimize injuries but also limit your liability in the event that someone is injured.

EXCEPTIONS TO THE RULE

While facilities can be found liable for a wide range of injuries, they are generally not liable for injuries that are a direct result of the game. Essentially, the thinking goes that by playing sports at all, athletes assume certain risks. The facility is generally not liable for those injuries, unless its negligence helped cause the injury. For example, a football player who sustains a knee injury when he's tackled would be unlikely to win a case against the stadium, because that's a regular part of playing the game. However, if the same player sustains an injury because of the poor condition of the field, he may well have a claim against the stadium.

The same principal usually applies to spectators. For example, courts have found that by going to a baseball game, fans assume the risk of being hit by balls and broken bats that fly into the stands. As a result, they are unlikely to win a suit against the facility for their injuries. If the facility's negligence contributed to the injury, however, it may still be held liable.

As a manager, you need to think defensively in order to limit liability. Try to anticipate what could go wrong at your facility, and then think about what you can do to limit the risk. If you notice a potential hazard, take care of it as soon as possible.

TRAINING WORKERS

Good employees are essential to maintaining a safe and well run facility. As a facility manager, you should make sure that your workers understand that safety is a high priority for your organization. Establish clear policies so that workers who spot something that could be dangerous know what to do and who to take their concerns to. Find the areas where poor maintenance might lead to safety concerns and do routine checks to make sure everything is in order. Train employees to use checklists so they don't miss safety steps. And when you're hiring new workers, try to assess whether they will be safety conscious and committed to making sure the facility is as safe as possible. If you take safety seriously, your staff will too.

WAIVERS

No matter how cautious you are injuries will happen. In order to limit liability, it is essential for you to require athletes to sign waivers that limit suits against the facility. If the athletes are minors, the waivers must also be signed by their parents.

Waivers typically reiterate that the activity is inherently risky, and the participant waives claims against the facility for any injuries sustained. While waivers are essential for limiting liability (and often required by insurance carriers), they do not eliminate the possibility of being sued.

LIABILITY INSURANCE

So you've limited your liability by running a safe facility. You've trained your workers, and you've obtained liability waivers from athletes. But

something totally unexpected happened, and someone got hurt. Let's say, a light fixture fell from the ceiling. This is exactly the type of disaster liability insurance was made for—the unexpected, but potentially very costly disaster. No matter what other precautions you take, you must obtain adequate liability insurance.

Don't skimp on your insurance policy. You want to avoid the bitter pill of regularly paying premiums only to find that when something does go wrong, it isn't covered because of the fine print. When you're selecting a new policy, you should consult with an expert on fine print, like an agent or attorney, about what coverage your organization needs, and what options exists.

CLAIMS MADE V. OCCURRENCE POLICIES

Policies typically only cover incidents that happen while they are in effect. But "claims made" policies are even more restrictive. They only cover incidents if the claims themselves are made while you have that policy. So if you switch insurance after the incident, but before a claim is made, *you will not have any coverage for that claim*. This is particularly problematic for facilities that deal with children, because there is usually an exception to the statute of limitations that allows minors to wait till they become adults to make claims.

In contrast, "occurrence" policies cover incidents that happen while they are in effect regardless of when the claim is made. If you switch insurance down the line, the policy will still cover incidents that happened while you had the old policy.

ATHLETIC PARTICIPATION EXCLUSION

Some policies exclude coverage for athletic participants (typically everyone from players to coaches). This is an unacceptable exclusion for sports facilities. After all, the majority of your claims are almost certain to come from athletes and team staff. No matter how tempting the price tag, these policies are not appropriate for sporting facilities.

RIDERS AND OTHER COVERAGE

In addition to a general liability insurance policy, your facility should consider riders that offer other types of liability coverage. Depending on how your facility operates, there are some common riders you should consider. If your facility serves alcohol, you should be sure to purchase liquor liability coverage. You should also consider some form of business auto liability coverage (i.e., a policy that covers any accidents employees get into while driving their personal vehicle for work purposes). Finally, if you have a large staff, you may wish to purchase employee benefits liability coverage, which will protect you from claims of negligence in the administration of employee benefit programs.

You can't eliminate liability or the possibility of an accident at your facility. But by taking careful precautions and obtaining adequate insurance, you can make your facility's liability manageable. ■

This article provides general information on facility liability matters and should not be relied upon as legal advice. A qualified attorney must analyze all relevant facts and apply the applicable law to any matter before legal advice can be given. Patrick McGuiness is a partner at Zlimen & McGuiness, PLLC. His law practice focuses on assisting green industry businesses and organizations with a wide range of legal issues. He can be reached at p McGuiness@zmattorneys.com.

A "BASIC" TRIP OVERSEAS REVEALS WHAT MATTERS IN TURF CARE

Safety, playability and aesthetics are the objectives of the sports turf manager. The single best way to achieve these three goals is having grass cover. Healthy, dense turfgrass goes a long way in assuring a field that is safe for the athletes, plays well and looks great. Detrimental to achieving an outstanding playing surface is wear, whether it is on a municipal field or at a professional stadium. Heavy wear affects footing, field hardness, consistency and aesthetics. Conquer wear and many problems are solved. Obviously limiting play is number one in combating wear, but beyond that what makes the difference?

Last summer I was fortunate to have travelled to the

United Kingdom to further my turf management education. The trip confirmed the deep-rooted concepts on turf management that many of us have been taught. Despite this training, we sometimes pay attention to the fringes of turf management, chasing problems with technology fixes and losing sight of what matters most. *The basics are what matter* when it comes to fighting wear. Growing environment, soil, species and cultivar selection: these are the foundations for fighting wear. They are more important than critical cultural practices. Yes, we need to irrigate properly, aerate, overseed, verticut and fertilize because of their importance, but the basics make the difference.

My first stop in England was at the Sports Turf Research

▼ The Yorkshire Dales.





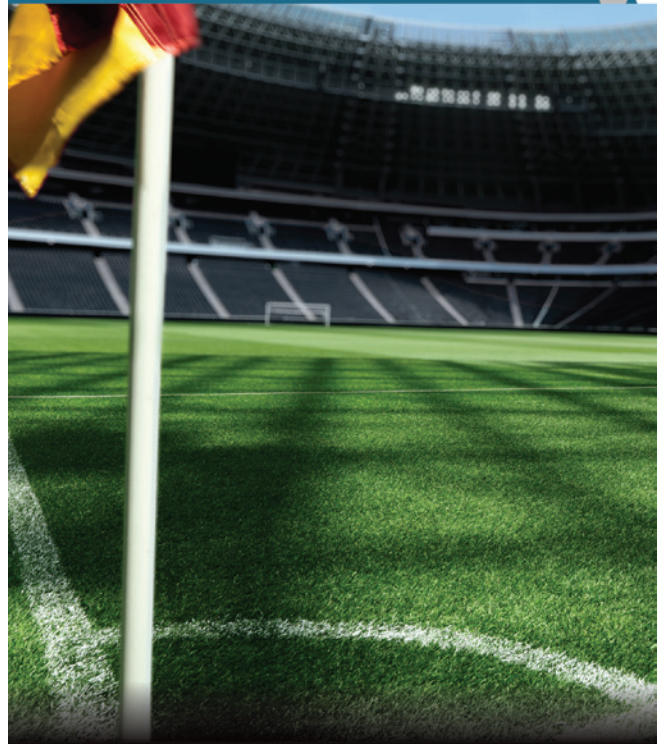
▲ Wimbledon, Court 1. Grow-in of new cultivars of perennial ryegrass.

» Much of their turfgrass research is similar to what occurs at American universities with the biggest difference being that **STRI concentrates much of their work on wear tolerance.**

Institute (STRI) in Yorkshire. But before my visit, I was able to do some hiking in the Yorkshire Dales. What does this have to do with sports turf management? On the theme that basics matter, the Yorkshire Dales are a perfect example of the importance of a brilliant growing environment. The Dales are river valleys that have acres and acres of almost perfect grass. No pesticides, fertilizers or irrigation are used and the meadows are frequently mowed by herds of sheep. There are hardly any weeds and the hiking paths show little signs of wear. What they do have is an ideal growing environment. It rarely gets too hot, they receive just the right amount of rain and suitable grass species are used. These vast areas have very few inputs but they are thriving. Proper fundamentals take care of most of their turf management challenges.

From the Yorkshire Dales, I headed to the STRI in Bingley for a tour from Head of Turfgrass Biology, Dr. Andrew Newell. The STRI performs turfgrass research and consults for many of the top sports events in the world such as The Open Championship (British Open), FIFA World Cup and Wimbledon. Much of their turfgrass research is similar to what occurs at American universities with the biggest difference being that STRI concentrates much of their work on wear tolerance. After being subjected to large amounts of artificial play, the differences in cultivar wear tolerance are striking and easy to see with some plots being almost completely deteriorated and some looking like no wear had been applied. Even product testing is aimed at wear tolerance, with many turfgrass plots subjected to different regimens of fertilizers, growth regulators and other products that claim to help with wear. They can scientifically show which of these products are effective and which ones are of little use when fighting wear. Choosing wear tolerant

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▲ Test area plots at the Sports Turf Research Institute, Bingley, England

cultivars is essential and gives the best possible chance of having a solid sward of grass.

After Yorkshire, I moved on to Wimbledon, home to grass tennis courts that receive some of the most intense play of any sport. With over 400 million television viewers each year and the best tennis players in the world competing, safety, playability and aesthetics are all an integral part of the Championships. To accomplish this, wear must be minimized. Under the leadership of groundsman Eddie Seaward and Neil Stubley, Wimbledon, along with science-based recommendations from the STRI, has conquered many of their wear problems by making sure they take care of the basics. Devotion to fundamentals has allowed for sections of the grass tennis courts that typically had 10-20% grass cover at the end of the tournament to now have 80% coverage.

The basics for Wimbledon in order of importance are (my ranking):

1. Grass species selection
2. Cultivar selection
3. Measurement
4. Cultural practices

After exhaustive research Wimbledon decided on perennial ryegrass as their preferred species. No grass is a perfect fit for tennis, but ryegrass offers the best balance between wear tolerance and playability. Along with this they have declared all-out war on *Poa annua*. Each grass court is stripped after the Championships and replanted with ryegrass so that *Poa* has virtually been eliminated from the courts. Using the best species that meet their particular tennis requirements gives them the head start they need to deal with

massive amounts of play in concentrated areas.

Choice of perennial ryegrass cultivars evolves almost every year so that new, improved grasses are being introduced. Wear tolerance is not the only criteria used to select cultivars; color (both winter and summer), texture and ability to tolerate mowing at 8mm are also essential. Picking the right varieties can make the difference between having no grass or 80% coverage on high play areas of the court.

Ranking measurement third ahead of cultural practices may seem out of order for most of us, but for a tennis tournament that needs perfection on the courts for 2 weeks straight, there is no question of its importance. Groundsmen know exactly how much moisture is in each court, how firm they are, and how much grass coverage they have each day so informed decisions can be made on cultural practices leading up to the tournament and precise decisions can be made during the tournament. All 19 Championship courts are prepared to be consistent with each other and records are kept so that tournament officials, players and groundsmen

know exactly how the courts played and fared.

Cultural practices are last on my list, but not because they are unimportant. Wimbledon aerates, verticuts and topdresses frequently and these practices are just as important to their success as they are to all turf managers. Since Wimbledon has taken care of the species, cultivar and measurement aspects, cultural practices are the piece that builds on top of the basics for a superior product and an epic playing surface.

As sports turf managers, we have an immense amount of modern resources to assist us in growing grass. Specialty fertilizers, biostimulants, growth regulators, wetting agents are some of the tools many of us use to step up to a next level of quality

field. Yes they matter and help, but many times they are used to improve our fields by a small percentage. A trip to the United Kingdom reminded me of the enormous advantages of proper growing environment, choosing the right grass and sound agronomic strategies and that the basics count most when striving to maintain grass cover. ■

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▲ Cleats on wear machine at the Sports Turf Research Institute, Bingley, England