▶ Dimple seeding

▲ **Adding** ≤ inch of topdressing

▲ **First day** of mowing 20 days after seeding

▲ The organic layer

FROM SEED TO PLAYING IN 35 DAYS

JUST 35 MILES NORTHWEST OF WASHINGTON, DC, sits an athletic oasis. Each year, thousands of athletes from around the world visit the Maryland SoccerPlex, a 600-acre park consisting of 22 pitches. The facility includes 16 native soil pitches (9 cool season, 7 bermudagrass), three sand-based pitches (1 cool season, 2 bermudagrass), and three synthetic fields. The Soccerplex has hosted everything from MLS Open Cup matches to the University of Maryland rugby team.

In the heart of the facility sits the Maureen Hendricks Field. In 2012, our crew decided that even though the stadium pitch was good, it could be better. The end goal of our thinking was for the pitch to be able to sustain more use while requiring less water and fungicides.

To make the pitch the best that it could be it needed to be renovated due to three main reasons: to remove the built-up organic layer, to eradicate the inherited*Poa annua* population, and to return the pitch to its original grade.

The pitch consisted of a 4-inch heavy organic layer. This layer was comprised of 11/2-inch thick cut sod and 21/2 inches of organic build-up that was consistent with all fields in our complex over a 12-year span. Clippings and the use of low-quality organic compost caused this organic layer. By

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.

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

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 aerification, 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.

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 dimple 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 ¾-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..