

# SportsField

## MANAGEMENT

Formerly  
SportsTurf magazine

March 2020

Vol. 36 No. 3

The Official Publication of the Sports Turf Managers Association

STMA Conference Post-show Recap **8** | Irrigation Troubleshooting **24**  
Weed Control **28** | Field Renovation Cost/Benefit Analysis **30**

# Walk-off Win

In his final season in professional baseball,  
Thomas Nielsen and crew claim FOY for Louisville Slugger Field

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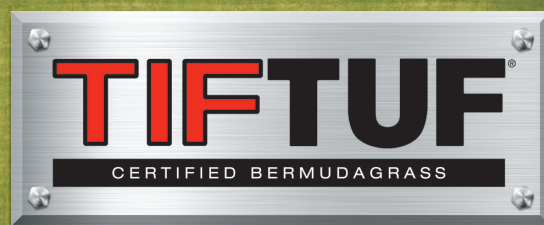
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# Editor's Note



## John Kmitta

Associate Publisher/  
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This was my first year attending the STMA Conference and Exhibition (January 13-16 in West Palm Beach, Fla.), and I was amazed at everything the event had to offer. It also didn't hurt that the weather hovered around 80 degrees every day.

The opening reception was a great place to network; the keynote speaker – Rodney Smith, Jr. – inspired attendees with his sheer passion to think of others and help those in need; and the Exhibition showcased the latest products and equipment from exhibitors. (See our full post-show recap beginning on page 8).

If you haven't attended the STMA Conference and Exhibition, you have really been missing out. The event offers everything – from networking to education to new products – to help you excel in the sports field management industry.

But what stood out to me most about the conference was the people. My predecessor had attended the STMA Conference and Exhibition every year for most of the past two decades, and he knew pretty much everyone. So

it was definitely daunting coming in as the new guy. In reality, I could not have been made to feel more accepted than I was at the conference. The level of kindness was overwhelmingly sincere, and the amount of people who sought me out to introduce themselves and offer to be of assistance was beyond expectations. I just wish I could have had more time to connect with more people.

Speaking of people, I would be remiss if I didn't mention new STMA President, Jimmy Simpson, CSFM. I was so focused on the news of our rebranding and redesign with my February Editor's Note that I failed to properly welcome Jimmy to his new role. I had the pleasure of interviewing Jimmy for the profile article I wrote about him for the February issue, and shortly thereafter met him in person at the conference. I am lucky to have had those interactions so early in my tenure as editor, and I can tell you that STMA is in great hands. I am thrilled to be working with Jimmy, and we should all be excited for the year to come. **SFM**

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# President's Message

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**At-Large Appointed:**

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Jim Cornelius, CSFM; Kyley Dickson,

PhD; Cliff Driver, CSFM; Scott Stevens,

CSFM; and Steve Ware

Webster's Dictionary defines evolution in many ways, but the definition that really resonates with where I believe STMA is today, states "a process of gradual and relatively peaceful social, political and economic advance." Since the creation of STMA, we have been in a constant state of change in order to work toward the mission of advancing professionalism in sports field management and safety through education, awareness programs and industry development. Sometimes large and noticeable changes are required, while other times it is small, yet very effective, changes that move us closer to achieving our mission. But all the while, the STMA is working continuously to educate people both inside and outside of our industry about the valuable work being done by our members.

Our association has had many accomplishments of which we can be proud, but the one that stands out to me most is the ability of our peers to adapt and evolve from the singular sports field manager-only focus to full-scale event managers. This evolution hasn't happened overnight, but is a process in which everyone has given input and is continually working to change.

Every day, our profession presents us with new challenges that we didn't expect or an event that "has to happen." We have evolved from the days of "stay off my grass" and have become the "can do"



**Jimmy Simpson, CSFM**

STMA President

[Jimmy.Simpson@townofcary.org](mailto:Jimmy.Simpson@townofcary.org)

group. This positive attitude toward change and challenging situations is what defines us. We can accomplish anything when collaborating with others.

Our profession has become what I like to term "memory makers." We are fortunate to play an instrumental role in making memories for others, whether they are World Series champions or Little League champions; people attending concerts, car shows and festivals; or simply those enjoying daily open play at the facilities we maintain. We put smiles on people's faces every day, and the work we do every day creates memories for many people beyond just the players on the field. Most of the people who encounter our work will never actually get to physically interact with the safe surface we create for the players, but they will always remember it.

Change is inevitable, but how we react to those changes and work with others will determine the continued evolution of our profession. **SFM**

Collaborating in change together,  
Jimmy Simpson, CSFM



# STMA 31st Annual Conference and Exhibition





The Sports Turf Managers Association (STMA) received outstanding participation at its 31st annual Conference and Exhibition in West Palm Beach, Fla., Jan. 13-16.

The West Palm Beach County Convention Center welcomed more than 2,100 participants, including nearly 1,300 sports field leaders and 850 exhibitors from 15 countries. Four days of industry education, networking events and product demonstrations were highlighted by a volunteer rebuild of Howard Park and sports complex tours including FITTEAM Ballpark and Hard Rock Stadium. Additionally, \$40,000 was raised for STMA's charitable arm, The Foundation for Safer Athletic Fields for Everyone (SAFE).

"Individuals from around the globe traveled this week to share innovative thoughts and collaborative ideas that will revolutionize our industry and the profession as a whole," said Jimmy Simpson, CSFM, newly elected STMA president, and facilities management coordinator for the Town of Cary, N.C. "Each member leaves with valuable knowledge to further elevate their facility and provide the safest conditions for athletes."

Attendees enjoyed 45 educational sessions and panels given by renowned industry leaders. Sessions focused on turfgrass management, facility management, synthetic turf, pest control, water, industry developments, baseball and professional development.

Award winners recognized included "Field of the Year" recipients in professional, collegiate, and schools and parks categories.

The prestigious Founders' Awards, acknowledging significant contributions to the profession, were bestowed to:

- Kim Heck, CAE, STMA – George Toma Golden Rake
- Allen Johnson, CSFM, Green Bay Packers – Dick Ericson Award
- Troy Smith, CSFM, Ewing – Harry C. Gill Award
- Victoria Wallace, University of Connecticut – Dr. William H. Daniel Award

The STMA President's Award for Leadership is given solely at the president's discretion to a person or entity that has advanced the sports field management profession. It is awarded in some years; other years it is not. This year's recipient of the President's Award for Leadership is Bill Norris, agronomist with Advanced Turf



*Allen Johnson, CSFM, Green Bay Packers, winner of the Dick Ericson Award*



*Kim Heck, CAE, STMA, winner of the George Toma Golden Rake.*



*Victoria Wallace, University of Connecticut, winner of the Dr. William H. Daniel Award.*





*Bill Norris, winner of the President's Award for Leadership.*



*Keynote Speaker Rodney Smith, Jr.*



*STMA Student Challenge*

Solutions. Norris has been a strong supporter of STMA and of its membership since joining the association in 1995, was a chapter co-founder, and has encouraged sports field managers in many ways. Norris routinely attends planning commission and city council meetings to support new sports field projects, he volunteers his time and knowledge as an agronomist to improve low-budget sports fields, and has donated materials to help stretch budgets.

In the "Student Challenge," teams of up to four were tested on their knowledge and skills in several key disciplines within the sports field industry for a chance of winning one of two \$5,000 grants.

Winners from four-year programs include:

- Penn State University, State College, Penn. – Team 403 (First Place)
- Iowa State University, Ames, Iowa – Team 405 (Second Place)
- Purdue University, Lafayette, Ind. – Team 418 (Third Place)

Two-year program winners are as follows:

- Mt. San Antonio College, Walnut, Calif. – Team 209 (First Place)
- Penn State University, State College, Penn. – Team 211 (Second Place)
- Ohio State University Agricultural Technical Institute, Wooster, Ohio – Team 208 (Third Place)

#### **KEYNOTE ADDRESS**

Rodney Smith, Jr., founder of Raising Men Lawn Care Service and 50-Yard Challenge, was the keynote speaker at the 2020 STMA Conference.

In 2015, Rodney observed an elderly man struggling to cut his yard in Huntsville, Ala., and was inspired to begin cutting lawns for people who needed help. From this beginning, he founded Raising Men Lawn Care Service (RMLCS) with the goal of helping people and enlisting girls and boys whose parents want them to learn about volunteerism. RMLCS provides free lawn care to elders, those who are disabled, single mothers and veterans who do not have the time, resources and/or money to take care of their yards.

Smith, Jr., shared his inspirational story of how his efforts to help others have grown to inspire young men and women throughout the country to help others in their communities. He also detailed his series of efforts to mow lawns



in all 50 states, which have helped veterans, the homeless, cancer research, and more. Through the Raising Hope program, Smith, Jr., is also raising money each month for a family in need. For more information about RMLCS, visit <https://weareraisingmen.com>.

*The Keynote was sponsored by World Class Athletic Surfaces.*

## SAFE NIGHT OF BOWLING AND SAFE GOLF TOURNAMENT

The Foundation for Safer Athletic Fields for Everyone (SAFE), STMA's charity, hosted the SAFE Night of Bowling, during the STMA's 31st Annual Conference on January 13 at Verdes Tropicana Bowl.

There were a total of 80 participants playing in this fun event to win prizes for first team, second team, individual highest score and various small games. The individual with the highest score was Brian Carey with a score of 198. The first place team was Brian Carey, Alan Dungey, Josh DeJong, and Jeremy Driscoll.

This year's SAFE Golf Tournament, was held Jan. 13 at the North Palm Beach Country Club. The North Palm Beach Country Club is a recently renovated facility consisting of an 18-hole, Jack Nicklaus Signature Golf Course. Proceeds benefited SAFE's scholarship, grant and research programs. Team and individual prizes were awarded.

This year's Golf Tournament was a great success and a gorgeous day in West Palm Beach. There were a total of 96 players, making up 24 teams – the most ever for this tournament. First place team winners included Randy Rider, Ed Brockman, Brian Blount and Christo Wallace.

Special thanks to the sponsors: Diamond Pro and Tri-Tex Grass (co-sponsors), Carolina Green (drink sponsor), and Little League International and Sunbelt Rentals, Inc. (hole sponsors).



*The Golf Tournament featured 96 players, making up 24 teams, to raise money for the SAFE Foundation.*

SAFE Foundation raised \$40,000 this year for SAFE with funds from the Golf Tournament, the SAFE Night of Bowling, and the Live and Silent Auction.



*80 participants came together for some fun and a good cause at the SAFE Night of Bowling.*

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*Seminar on Wheels made stops at Hard Rock Stadium (top) and FAU Stadium (above).*



*Seminar on Wheels at Palm Beach Gardens North County District Park.*

## SEMINAR ON WHEELS

The 2020 Seminar on Wheels tours, sponsored by Bush Sports Turf, were held both Monday and Thursday. Attendees of Monday's tours visited the Hard Rock Stadium, FAU Stadium and Palm Beach Gardens North County District Park. Attendees of Thursday's half-day tour ventured to Roger Dean Chevrolet Stadium and FITTEAM Ballpark of the Palm Beaches.

At Hard Rock Stadium — home of the Miami Dolphins, University of Miami and the Orange Bowl, and site of Super Bowl LIV — attendees got to see the Super Bowl field preparation, behind-the-scenes areas, and hear Sports Turf Manager Tom Wilson speak about the many different and diverse events it hosts. Attendees also heard from the NFL Super Bowl event team about the field preparation and challenges. Next, they toured FAU Stadium in Boca Raton, home of the Florida Atlantic University football team, and visited its new practice football fields at the Schmidt Family Complex. The tour included the recently renovated FAU softball field, with Latitude 36 bermudagrass and Dura Edge skinned area. The final stop was the Palm Beach Gardens North County District Park, which opened on June 29, 2019. It spans 81.9 acres including 21 acres of Latitude bermudagrass grown in by the county's Parks and Grounds Division. Featuring seven lighted multi-purpose fields, two playgrounds, walking trails, green space, a maintenance building, and a splash pad, this \$13.7 million-dollar project was paid for by a one-cent sales tax fund.

Thursday's Seminar on Wheels stopped at Roger Dean Chevrolet Stadium, a 90-acre complex in Jupiter, FL. The Spring Training home to the Miami Marlins and St. Louis Cardinals, the complex also hosts both clubs' Advanced A and Gulf Coast League affiliates. The Town of Jupiter (JTAA) uses the complex for its recreational leagues from April through mid-December. The final tour stop was the FITTEAM Ballpark of the Palm Beaches, located in West Palm Beach. It is the Spring Training home to the Houston Astros and the Washington Nationals. The site also hosts baseball, soccer, lacrosse and other sports.

## FIELD REBUILD

STMA and Project Evergreen (PE) teamed up for a makeover of Howard Park's softball field in West Palm Beach, Fla., on January 12.

The field needed a renovation to keep it a vibrant part of the community. It receives heavy





*STMA Immediate Past President Jody Gill, CSFM, passes the gavel to new STMA President Jimmy Simpson, CSFM.*

usage, and the multi-use outfield needed enhancements to allow it to become a sustainable playing surface.

Seventy-five volunteers — including sports field managers, lawn care professionals, landscape contractors and groundskeepers — assisted with the transformation that had an estimated value in excess of \$50,000. The project included leveling and refurbishing the existing softball infield and refurbishing the warning tracks. It involved core aeration, fertilization and slit seeding the entire outfield turf from the infield radius to the warning track, which is approximately 60,000 square feet. The group inspected and adjusted irrigation heads and replaced as necessary, as well as rebuilt the pitcher's mound and batter's boxes/catcher's box and installed a new home plate. The infield was also topdressed with two tons of conditioner.

This is the second project that STMA and PE co-led. Last year, a field rebuild was conducted at a Phoenix Park in advance of STMA's national conference.

## 2020 STMA CONFERENCE EDUCATION SESSION RECORDINGS NOW AVAILABLE

STMA recorded educational sessions at its 2020 conference to benefit conference attendees unable to make it to concurrent sessions and sports field managers unable to

make it to the conference. The recordings are also valuable as a refresher throughout the year for sports field managers to stay current and educated in the industry. Recorded sessions are available through an online library where users can have access to education at any time throughout the year. The library is accessible on portable devices such as iPad, iPhone, and other tablet devices.

Full conference attendees have free, unlimited, life-time access to the online library.

Conference recordings are also available to benefit those unable to attend the conference.

Those interested can purchase online access to all the recordings for \$99. Access to individual sessions is \$10 each. For more information, visit

<https://intelliquestmedia.com/store/events/sports-turf-2020>.

## 2020 STMA BOARD OF DIRECTORS

The STMA board of directors officially took office during the Conference and Exhibition.

Jimmy Simpson, Certified Sports Field Manager (CSFM) and facilities management coordinator for the Town of Cary (North Carolina), has been elected STMA president. Simpson will serve a one-year term.

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*Back row (left to right): Jody Gill, CSFM; Adam Thoms, Ph.D.; Scott Thompson, CSFM; Clark Cox, CSFM; Joshua Koss, CSFM; and Jeremy Bohonko. Front row (left to right): Brad Thedens, CSFM; Jeremy Driscoll; Nick McKenna, CSFM; Jimmy Simpson, CSFM; and James Bergdoll, CSFM. Not pictured: Turner Revels and Stephen Lord, CSFM*

Other elected-officers include:

- Immediate Past President – Jody Gill, CSFM, grounds coordinator, Blue Valley School District (Overland Park, Kan.)

- President-Elect – Nick McKenna, CSFM, assistant athletic field maintenance manager, Texas A&M (College Station, Texas)

- Commercial Vice President – Jeremy Bohonko, regional manager – Piedmont Region, Ewing Irrigation and Landscape Supply (Charlotte, N.C.)

- Secretary / Treasurer – James Bergdoll, CSFM, director of park maintenance, City of Chattanooga Public Works (Chattanooga, Tenn.)

Directors fulfilling a second-year term:

- Professional Facilities Director – Stephen Lord, CSFM, head groundskeeper, Cincinnati Reds (Cincinnati, Ohio)

- K-12 Director – Jeremy Driscoll, grounds supervisor, St. Marks High School (Wilmington, Del.)

Members elected to Director positions:

- Higher Education Director – Clark Cox, CSFM, assistant athletics director of sports turf and landscaping, University of South Carolina (Columbia, S.C.)

- Academic Director – Adam Thoms, Ph.D., assistant professor, Iowa State University (Ames, Iowa.)

- Parks and Recreation Director – Brad Thedens, CSFM, park caretaker, City of Sioux Falls (Sioux Falls, S.D.)

- At-Large Elected Director – Scott Thompson, CSFM, superintendent of sports fields and grounds, Duke University (Durham, N.C.)

Members appointed to Director positions:

- Commercial Director – Turner Revels, president, Revels Turf and Tractor (Fuquay-Varina, N.C.)

- At-Large Appointed Director – Joshua Koss, CSFM, landscape services manager, San Diego State University (San Diego, Calif.)

Next year's STMA Conference and Exhibition will be held in Palm Springs, Calif. Jan. 11-14, 2021. For more information, visit [www.stma.org](http://www.stma.org). **SFM**



## JOHN MASCARO'S PHOTO QUIZ

### CAN YOU IDENTIFY THIS TURFGRASS PROBLEM?

**PROBLEM:**

Painted area not in a line

**TURFGRASS AREA:**

Soccer penalty arc

**LOCATION:**

China

**GRASS VARIETY:**

Rye / bluegrass mix

*Answer on page 33*

*John Mascaro is president of Turf-Tec International*



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## LOUISVILLE SLUGGER FIELD

During the last five years, Louisville Slugger Field's resume ranks among the best. Along with 70 Louisville Bats baseball games, we host Louisville City FC, a professional soccer team, 16 times a year from March to November. That requires a conversion process that takes two to three days. Add in a college baseball tournament, movie nights, scout campouts, and concerts, more than 140 events were on the surface this year! Louisville, Ky., is one of the toughest places in the country to grow

grass because of its location within the transition zone. To combat this issue, we actually grow three grasses: North-bridge bermuda, HGT bluegrass, and an SOS annual ryegrass. The bermuda and bluegrass provide year-round coverage, while the ryegrass is used for color consistency during the bermuda's dormancy. When soccer begins play in March, the bermudagrass is dormant, and the ryegrass and bluegrass are performing well. During the summer, the bermuda strengthens and the rye disappears. The

---

The Field of the Year Awards program is made possible by the support of sponsors Carolina Green Corp., Precision Laboratories, and World Class Athletic Services.





**"It's 28 years in professional  
baseball, and my last.  
It's nice going out on top."**

*— Thomas Nielsen*



## FIELD OF THE YEAR PROFESSIONAL BASEBALL



*(Left) The day before the first soccer game. (Right) For soccer games the mound lowers into the ground and is leveled with foam and approximately 6 yards of sand. AstroTurf is then laid on top and pinned down.*

bluegrass will survive in our high-traffic areas where the bermuda was worn out in the early spring. With a never-ending event schedule, it's a constant battle of transitioning the field to 100-percent coverage of any grass. It may seem like a lot going on, but we have found this to be the best solution for year-round consistency with two professional teams.

Hosting two professional sports teams is a major challenge for us. As soon as one team leaves, we begin

setting up for the other. This season we even had three overnight conversions so the other sport could play the next day. This leaves very little time for cultural practices or field repairs. For soccer, AstroTurf is laid across our entire clay surface, and our mound is dropped into the ground using a hydraulic lift. It isn't perfect, as we end up having to redo our clay edges every time the field is converted. If it weren't for the remnants of the paint

lines, most players wouldn't even realize that soccer is played on our field, which I take as compliment to us. Considering all the events and our location within the transition zone, our field could have easily looked poor and we would have had a valid excuse for it. But because a lot of hard work and long hours from our crew, I firmly believe that our field rivals any other field in our league.

— Thomas Nielsen

**Category of Submission:** Professional Baseball

**Sports Field Manager:** Thomas Nielsen

**Title:** Head groundskeeper

**Education:** Associates Degree in Turf Management

**Experience:** Head groundskeeper at Louisville Slugger Field for the past 20 years. Prior to that, head groundskeeper with the Chattanooga Lookouts and the Eugene Emeralds. Also worked with the Milwaukee Brewers and at the Kansas City Royals Spring Training site.

**Full-time staff:** Aaron Fink and Tod Shafer

**Students/interns, part-time and seasonal staff:**

Amanda Potter, Noah Jones, Matthew Baker, Matt Volz, Wade Mason, Michael Netherton, Scott Gerlach, Nolan Dumstorf, Ryan Fischer and Blaine Whitehouse

**Volunteers:** Tyler Wiese, J.D. McKay, Ethan Fulkerson and Levi Chandler

**Original construction:** 1999

**Turfgrass:** Northbridge bermuda with some HGT bluegrass

**Rootzone:** Sandy loam

**Overseed:** SOS, an annual ryegrass

**Drainage:** Corrugated plastic sub drainage

**Previous Field of the Year wins:** This field won in 2002 and 2004, but has since been reconstructed from a bluegrass to a Northbridge bermuda field. Along with this change, Louisville City FC, a professional soccer team, has been playing on the field from 2014 to present.



**SportsField Management (SFM):**

What are you most proud of with this win, and/or what do you think stands out most about the winning field?

**Nielsen:** It's 28 years in professional baseball, and my last. It's nice going out on top. Next year I will be managing the turf for Lynn Family Stadium, home of Louisville City FC. What I am most proud of is my crew. They work so hard. Having two different professional sports played on the same field is very hard on the field, and the crew and this award make it all worthwhile. My crew was absolutely amazing. They are the reason I've been able to make it through the last five years.

**SFM:** Louisville Slugger Field won STMA Field of the Year in 2002 and

2004. What sets this win apart from the previous wins?

**Nielsen:** For the first two wins I only had baseball on my field. With this win we played soccer and baseball. It was much more difficult to have as high of quality playing surface.

**SFM:** What are the biggest challenges you have with transitioning the field from baseball to soccer, and how do you approach those challenges?

**Nielsen:** Having the time. You have to be a good manager of your time and resources. With having baseball and soccer on the same field there is a lot less time for the field to rest and recover — and that goes the same with my crew. The field is only as

good as the crew that works on it. If they're worn out, the field will not be as good. Baseball season has more than 80 home games and soccer has only about 20 home games, but each game for soccer required a day to set up the synthetic over the infield clay, then a day to paint the soccer lines and lower the pitching mound (which was done by activating electric screw jacks, which would bring the mound down into the ground). Then we would cover the mound with foam pieces, then two inches of sand for leveling. Then we would put synthetic turf on top of that and pin it around all the edges with sod staples. This process took three to five hours, depending on the manpower. Then it took a day for the soccer game. Then a day to switch it back to




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baseball. This did not leave much time for anything else. So we had to use our time wisely to get everything done and take some time off.

**SFM:** What advice do you have for other sports field managers – especially those who are managing multi-use fields?

**Nielsen:** Hope for the best but be prepared for the worst. Don't dwell on things that are out of your control. The groundskeeper seems to go unnoticed most of the time, and this is what we want. Until something bad happens,

then we get noticed. So, if we are ready for the worst, we will never be unprepared for any situation that arises, and we will stay unnoticed.

**SFM:** What attracted you to a career in sports field management?

**Nielsen:** My first love was for the outdoors — I always wanted a job outside. My second love was sports, especially baseball. At about age seven my dream was to be head groundskeeper for the Milwaukee Brewers, but I

### Judge's Comments

What stood out to me with the Louisville Slugger Field application is that he has a double-edge sword of maintaining a field in the transition zone and keeping it green and managing wear throughout the seasons. In addition he has to provide a playing surface for two different sports — baseball and soccer — which requires converting the infield clay and mound to turf, as well as managing other non-sporting events at the stadium. His solution of inter-seeding cool- and warm-season grasses for handling wear and his explanation of the reasoning was well stated. I also was impressed with his method for converting his field to soccer by employing AstroTurf and a hydraulic lift system for his pitchers' mound to enable him to make the conversion with the tight window required. I liked his photo submission because it was in chronological order, with good explanations for each photo. The photos were a good mix, and reflected what he had to deal with throughout the year.

— Michael Flowers, CSFM, president of Championship Turf Services.

**Editor's Note:** A panel of 11 judges independently scored Field of the Year entries based on playability, appearance of surfaces, utilization of innovative solutions, effective use of budget and implementation of a comprehensive agronomic program. We have asked the judging panel to provide insight into why each winning field was selected, and we will share those comments with the corresponding field profiles.



didn't think that it was a real job. Why would someone pay me to do something that I would do for free? Growing up in Wisconsin, I had my own baseball field in the backyard, which included a home run fence, 20-foot foul pole and real canvas bases. Each week I would mow the baseball field and put different patterns in the grass. This is what I love to do. So I feel very blessed to be in a career I've always wanted to do.

**SFM:** Who would say are your mentors in the industry, and/or what is the best piece of advice you have received?

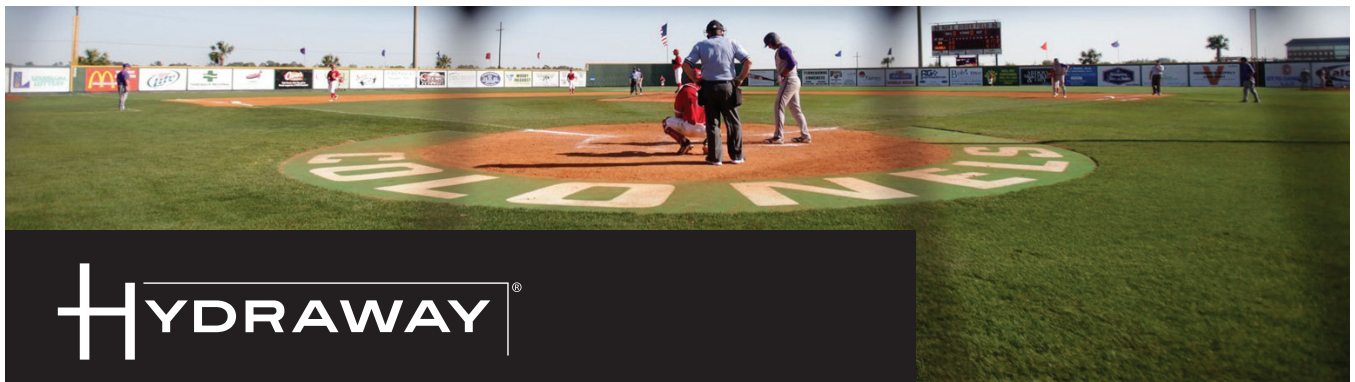
**Nielsen:** George Toma. His best advice was, "Do that, and then some. Don't just do the bare minimum. Do extra, and above, on everything you do — not just in groundskeeping." Gary Vandenberg taught me about being even keeled and to not get too up or too down about any situation. Don't blow things out of proportion and don't take it out on your crew. I always felt Gary was someone I could confide in or go to if I had a question. His door was always open.

**SFM:** What's the greatest pleasure you derive from your job?

**Nielsen:** I have been a mentor to so many people. After 28 years in the sports field industry, I have more than 50 past crew members who have gone on to careers in the industry. This is what I'd like to call the Nielsen mafia.

**SFM:** How has your career benefited from being a member of STMA?

**Nielsen:** STMA helps me in so many different ways, including keeping me up to date with new trends in the industry, helping with my continuing education and, most importantly, networking. Being involved with the local sports turf manager chapters and the national association, you never feel that you are alone. There's always someone you can contact who has had the same problem as you. This organization is like one big family. I love the STMA, and I appreciate everything they do for me and my family. I will always be a part of this organization. **SFM**



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- Seth Thibodeaux, Head Baseball Coach Nicholls State University

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# Tracking Every Drop

Irrigation audits and troubleshooting for success

By Chrissie A. Segars, Ph.D. and Charles Fontanier, Ph.D.



*Photo provided by Toro*

Whether it is your first day on the job or you are a seasoned veteran, knowing your irrigation system is vital for successful management of your sports fields. Each field is a unique organism that requires proper maintenance practices in order to create a safe

playing surface for athletes. This article provides basic steps on conducting irrigation audits and how to use those results to make your system more efficient.

An efficient irrigation system not only gives us less headaches, it leads to reduced water use/wastage,

less hand watering, less need for inputs like fertilizer or chemicals, and less budgetary concerns. An efficient irrigation system has four components: 1. The correct hardware, 2. Proper installation, 3. Long-term maintenance, 4. Management of the system.





Catch can for irrigation audits.



Catch can test.

## THE AUDIT

An irrigation audit is a method of inspecting and measuring the amount of water applied and the efficiency with which the sprinklers are working together to apply the water within an individual zone or test area. When the audit is done, the results are compiled to be used in combination with your observations to facilitate irrigation management. Before conducting an audit, we should fix the obvious. Problems like broken sprinkler heads, mismatched or clogged nozzles, leaky heads or pipe, and heads that are not level will cause inaccurate audit results. These issues should be no-brainers and are easily identified with a simple visual check. A good field manager will make a habit of visually inspecting and auditing their irrigation system regularly.

## STEPS FOR THE IRRIGATION AUDIT:

- Site evaluation
- Irrigation system tune-up
- Catch can test
- Calculations
- Report findings
- Make decisions

For the purpose of this article, we will focus on the catch can test and a few of the most common calculations. The key outcomes of a catch can test are: 1. Average precipitation rate, 2. Distribution uniformity coefficient, and 3. Runtime.

Can #1 <u>.25</u>	#11 <u>.45</u>	#21 <u>.30</u>
Can #2 <u>.31</u>	#12 <u>.36</u>	#22 <u>.29</u>
Can #3 <u>.42</u>	#13 <u>.44</u>	#23 <u>.67</u>
Can #4 <u>.30</u>	#14 <u>.28</u>	#24 <u>.65</u>
Can #5 <u>.42</u>	#15 <u>.34</u>	#25 _____
Can #6 <u>.32</u>	#16 <u>.38</u>	#26 _____
Can #7 <u>.61</u>	#17 <u>.51</u>	#27 _____
Can #8 <u>.41</u>	#18 <u>.61</u>	#28 _____
Can #9 <u>.44</u>	#19 <u>.56</u>	#29 _____
Can #10 <u>.51</u>	#20 <u>.55</u>	#30 _____

Figure 1. Catch can test results with Lower Quarter cans highlighted.

## KEY QUESTIONS BEFORE STARTING THE TEST:

**Q: How many cans do I need?**

**A:** At least 24 uniform catch cans per zone.

**Q: How should the cups be spaced?**

**A:** Cups should be spaced within 2 to 3 feet of corner head and every one-third of the distance between the heads (or one-quarter for >40-foot spacing).

**Q: How long do I need to run the zone?**

**A:** Run zone under “normal” operating conditions (especially pressure) in 5-mph-or-less wind. The amount of water should be 1.5 times the throat area of the cup. Spray heads: 5- to 10-minute runtime. Rotors: 10- to 20-minute runtime (at least five full rotations for large rotors).

**Q: Do I need to test every zone?**

**A:** Ideally, yes, every zone should be tested to promote consistency. In cases where the design of two zones is identical, an audit on one zone can be applied to the similar zone (termed “linking”).

Once your audit is done, it is time to do some math, and take a look at some examples of calculations done from an audit. This example is



based on catch cans that measure in inches. Other catch cans might measure in mL or other volume. In these cases, an additional conversion may be required. (Note: All equation information was adapted from STMA's resource, "Conducting an Irrigation Audit.")

Figure 1 shows an example from an irrigation audit using 24 catch cans. This information is used to calculate the system Precipitation Rate (Figure 2) and the Distribution Uniformity ( $DU_{LO}$ ) (Figure 3). Precipitation rate is simply calculated by taking the average of the catch can depth, dividing by the test runtime, then multiplying by 60. This will give you the system output rate per hour. The most common method for calculating  $DU_{LO}$  uses the Lower Quarter of catch can measurements to determine the average for the driest part of a zone. For a test using 24 catch cans, that means you will need to determine the average of the driest six cups. For this example, we took the average of can #1, 2, 4, 14, 21, and 22 (Figure 1). After plugging the data into the formula in Figure 3, we now know this zone has a  $DU_{LO}$  of 67 percent, which would be considered acceptable but still leaving room for improvement. A  $DU_{LO}$  of 70 percent is considered ideal. Of course, no irrigation system will be 100 percent, but adjustments can be made, and the system re-tested to obtain the best performance for that zone.

Calculating the  $DU_{LO}$  can be valuable simply for scouting problems in the system, but can also be used directly when scheduling irrigation. For example, let's assume we would like to apply 0.5 inches of water to our field. If the distribution uniformity is 67 percent, that means not all of our field will get the amount of water we want. To correct this, we would divide our target irrigation amount by the uniformity (0.5 inches/0.67 inches = 0.75 inches). In this case, we would need to apply approximately 0.75 inches of water to get our desired amount of 0.5 inches to all parts of the field. Now, using the schedule multiplier, along with the precipitation rate, we can determine our runtime (Figure 4).

## TROUBLESHOOTING

A critical factor of keeping an efficient irrigation system is pressure management. Low pressure can cause problems including lack of head to head coverage, which leads to uniformity issues, irrigation heads may not pop up from the ground, and ultimately a decline of plant health. High pressure can also cause a loss of irrigation efficiency. If pressure is high, it will lead to fine water droplets that will have increased evaporation, are easily carried away by wind, and ultimately a decline in uniformity and plant health. In severe cases, high pressure may lead to blowouts and broken parts of your irrigation system.

If you suspect a pressure issue, the first step is to measure the water pressure from one of the heads. Although this may not show pressure losses within the system, it can be a general guide to how much pressure is

### Calculate Precipitation Rate (PR) (using in)

$$PR = \frac{\text{Average Catch Can Depth}}{\text{Testing Run Time}}$$

$$PR = \left[ \frac{(.43 \text{ inches})}{(.15 \text{ minutes})} \right] \times 60$$

$$\text{PRECIPITATION RATE} = 1.72 \text{ in/hr}$$

Figure 2. Precipitation rate calculation.

### Calculate Distribution Uniformity (DU)

$$DU \text{ (of lower quarter)} = \frac{\text{Avg Catch in lower quarter}}{\text{Avg Catch Overall}}$$

$$DU = \frac{.29 \text{ inches}}{.43 \text{ inches}}$$

$$\text{DISTRIBUTION UNIFORMITY (DU)} = .67 \text{ or } 67\%$$

Figure 3. Distribution uniformity Lower Quarter calculation.

$$\text{Run Time per Irrigation Cycle} = \frac{\text{Target Irrigation Depth}}{\text{Zone Precipitation Rate}}$$

$$\text{Run Time } 26 \text{ minutes} = \frac{0.75 \text{ inches}}{1.72 \text{ inches/hour}} \times 60$$

$$\text{Run Time per Irrigation Cycle} = 26$$

Figure 4. Runtime calculation using the scheduling multiplier.

being carried to the system. When checking system pressure, don't overlook the obvious. Make sure the isolation valve is open, check your backflow device to ensure it is not partially closed, if you have a pressure regulator, make sure it is properly adjusted, and look for debris that may be clogging heads, filters or valves. If you have checked these simple fixes, finding bigger problems may be tough to address on your own. Consulting an irrigation professional may be the next step if bigger problems arise.

No irrigation system is 100-percent efficient. All systems will require periodic maintenance, but annual auditing will help to avoid major issues. When conducting an audit, use your eyes to observe problems, and the results





**Unsuitable irrigation pressure showing "donuts" on fields.**

to confirm performance of your system. Make adjustments, then repeat the audit if necessary. You can then use best management practices to conserve water and maintain player safety. As always, please use your

network and friends to your advantage. Do not be afraid to ask questions, and always continue learning. **SFM**

*Chrissie A. Segars, Ph.D., is assistant professor and extension*

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Charles Fontanier, Ph.D., is assistant professor of turfgrass, Department of Horticulture and Landscape Architecture, Oklahoma State University, Stillwater, Okla.

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## IRRIGATION AUDIT KIT RESOURCES

Irrigation audit kits can be bought from irrigation companies and many universities. Check with your local distributor or contact an agricultural university for more information.

## HELPFUL TERMS

**Catch Can:** Typically a conical-shaped apparatus used to catch irrigation water from sprinklers. Any short or straight-sided container can work.

**Distribution uniformity:** A measure of how uniformly water is being applied to the plants in a measured area.

## Lower Quarter Distribution

**Uniformity ( $DU_{LQ}$ ):** Average water applied in 25 percent of driest areas divided by the average water applied over the total area.

**Precipitation rate:** Rate of water applied to the turf, usually in units of inches per hour.

**Pressure:** A force unit per area in pounds per square inch (psi).

**Scheduling multiplier:** Equation used to adjust runtime based on distribution uniformity.

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# New Herbicides for the New Year

By Devon Carroll and Jim Brosnan, Ph.D.

A new year often brings new technology to the turfgrass industry, and 2020 is no exception. Five new herbicides will be available to field managers in 2020, including Coastal, Cheetah Pro, Crew, GameOn and Vexis. These products contain active ingredients from six mode-of-action groups with several combined in pre-packaged mixtures. Mode-of-action groups indicate the physiological mechanism a herbicide uses to control weeds, and can be easily identified on product labeling using the Weed Science Society of America (WSSA) group numbering system (e.g., dithiopyr [the active ingredient in Dimension] belongs to WSSA Group 3).

These new herbicides have been researched for several years at land-grant universities throughout the United States to determine how they can be optimally used to control weeds of cool- and warm-season turfgrass while minimizing environmental impact. This article will outline attributes of these new herbicides to aid athletic field managers considering incorporating them into their weed management programs.

## COASTAL

Coastal is a new herbicide mixture from Sipcam Agro that contains pro-diamine (WSSA Group 3), imazaquin (WSSA Group 2), and simazine (WSSA Group 5). This mixture can be applied preemergence to control many grassy and broadleaf weeds including crabgrass (*Digitaria* spp), annual bluegrass (*Poa annua*), and goosegrass (*Eleusine indica*) on

bermudagrass (*Cynodon* spp.) and zoysiagrass (*Zoysia* spp.) playing surfaces. Additionally, Coastal offers early-postemergence control of several weed species. Depending on geography, Coastal should be applied between September 15 and May 31 at rates of 48 to 64 fl. oz./A. Coastal can hamper spring transition of warm-season turfgrasses. Therefore, use as turfgrass is emerging from dormancy is not recommended.

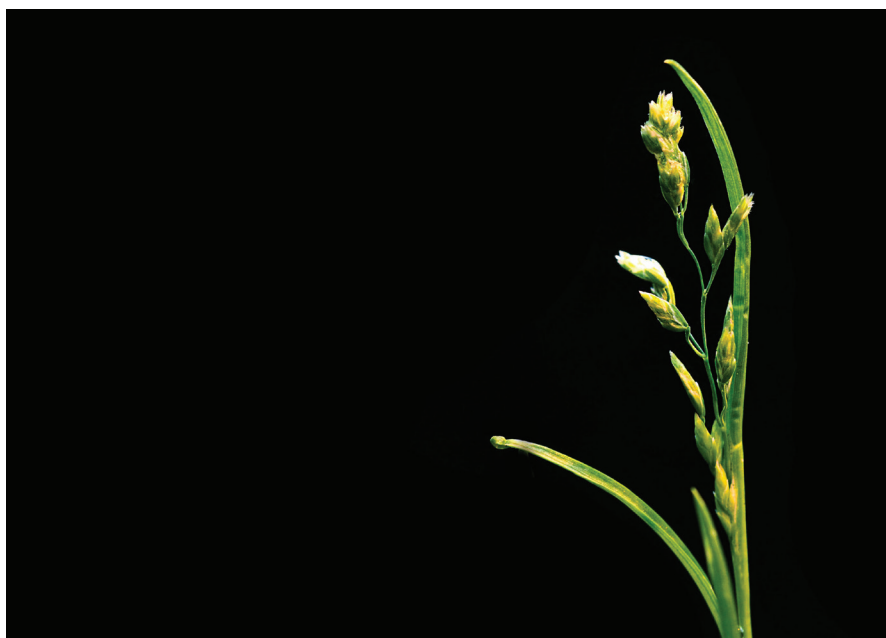
## CHEETAH PRO

Cheetah Pro is a new herbicide from NuFarm that offers an alternative to glyphosate on select weeds. Cheetah Pro contains 24.5 percent glufosinate (WSSA Group 10), the same active ingredient in Finale. However, Finale (11.3 percent glufosinate) is less

concentrated than Cheetah Pro, so turfgrass managers must carefully read product labeling to identify optimal Cheetah Pro application rates. As a non-selective herbicide, Cheetah Pro can be applied to dormant bermudagrass at rates of 24 to 82 fl. oz./A based on weed size and growth stage. The herbicide is labeled for control of nearly 200 weed species including annual bluegrass and other grasses that may be considered weeds in mixed turfgrass stands. Research at the University of Tennessee has shown that herbicides containing glufosinate can control certain populations of annual bluegrass that have evolved resistance to glyphosate. Sequential applications of Cheetah Pro may be required to control certain weed species and can be applied as early as five days after initial treatment.

## CREW

Crew is a new herbicide mixture from Corteva Agriscience that contains isoxaben (WSSA Group 21) and dithiopyr (WSSA Group 3) labeled for preemergence control of



Close-up of annual bluegrass. Photos by Jose J. Vargas



many broadleaf and grassy weeds including crabgrass, goosegrass and annual bluegrass. Additionally, Crew can be used for postemergence control of newly emerged crabgrass through the one-tiller growth stage. Crew is labeled for use on most turfgrass species used on athletic fields including bermudagrass, zoysiagrass, seashore paspalum (*Paspalum vaginatum*), Kentucky bluegrass (*Poa pratensis*), perennial ryegrass (*Lolium perenne*), and tall fescue (*Festuca arundinacea*). However, the herbicide should not be applied to fields that have been sodded, sprigged or reseeded until they are fully established. Additionally, sports field managers need to delay seeding or sodding fields treated with Crew until 8 to 12 weeks after application. Crew is labeled for use at 150 to 200 lbs./A.

#### GAMEON

Another new Corteva Agriscience product, GameOn, is a mixture of 2,4-D choline, fluroxypyr, and halauxifen-methyl (Arylex™). All of these active ingredients are synthetic

auxin herbicides (WSSA Group 4) with efficacy for postemergence control of broadleaf weeds such as plantain (*Plantago* spp.), clover (*Trifolium* spp.), and dandelion (*Taraxacum officinale*). Similar to Crew, GameOn is labeled for most turfgrass species used on athletic fields including Kentucky bluegrass, perennial ryegrass, and tall fescue (*Festuca arundinacea*). GameOn can be used on bermudagrass athletic fields; however, the height of cut must be greater than 0.5 inches and application rate is capped at 3 fl. oz./A (compared to 4 fl. oz./A on other grasses). GameOn is rainfast within two hours of application and, unlike other 2,4-D containing herbicide mixtures, the product is formulated to reduce odor. Athletic field managers should be advised that GameOn should not be applied to bermudagrass when breaking dormancy in the spring. Additionally, seeding fields treated with GameOn should be delayed for a minimum of three weeks after application. Lastly, turfgrass managers should be aware that the product is not labeled for use on residential turf.

#### VEXIS

Vexis is a new granular herbicide from PBI Gordon that contains the acetolactate synthase inhibiting herbicide pyrimisulfan (WSSA Group 2). Vexis is labeled for postemergence control of sedge (*Cyperus* spp.), kyllinga (*Kyllinga* spp.), rush (*Juncus* spp.), and select broadleaf weeds on nearly all cool- and warm-season turfgrasses used for athletic fields. Initially, Vexis will be available to athletic field managers in a 2-pound shaker can designed for spot treating individual weeds (rather than broadcasting across an entire field). One shaker can supplies enough product to treat an area as large as 500 square feet. Athletic field managers must delay seeding or sodding for three weeks after Vexis treatment; when using the product on newly established turfgrass a three-week delay is required as well. Unlike most granular herbicides, Vexis can be applied to wet or dry foliage, but will require irrigation (or rainfall) within 48 hours after application. **SFM**

Devon Carroll is a Plant, Soil, and Environmental Science Ph.D. student focused in turfgrass weed science in the Department of Plant Sciences at The University of Tennessee, Knoxville.

Jim Brosnan, Ph.D., is a professor in the Plant Sciences Department at the University of Tennessee (UT) and leader of UT's new Weed Diagnostics Center. His research focuses on effective and economical strategies for broadleaf and grassy weed control in various turfgrass systems, including golf courses, athletic fields, and residential landscapes.

**Editor's Note:** This overview is intended as an informational look at what is new on the market for 2020, and does not imply an endorsement of any particular product(s) by the authors or SportsField Management.



Close-up of goosegrass





Excavation of the infield nearly complete.



# Renovation Justification

LESSONS LEARNED FROM A PROFESSIONAL BASEBALL FIELD RENOVATION PROJECT, AND THE IMPORTANCE OF COST/BENEFIT ANALYSIS

BY WES GANOBCIK



*Jason Griffiths from Ag Design excavating subgrade material from the infield to drop the elevation.*

In order to justify a field renovation to your organization, you must be able to show the costs associated with the existing deficiencies at your facility. Whether those are drainage problems, grading problems, field material problems, irrigation problems, etc., it is imperative that you document costs for tools and materials, as well

as work hours that are a direct result of those issues.

Additionally, it is important to document loss of revenue due to event cancellations. You will then need to research the costs associated with making upgrades that you believe will help overcome those issues and cancellations. Once you have estimated



costs on both sides of your proposal, you can then go to your organization as a well-informed sports field manager, and provide hard data in an effort to justify your proposed renovations and improvements.

Once you have gotten approval for a renovation, it is extremely important to write very tight specifications and preset conditions into the pro-

posal before going to bid or hiring a contractor. Depending on your organization and whether or not you are a private entity or government controlled, these details can vary widely. Regardless, it is important that you specify in great detail the exact materials you want used, the methods you want taken, the overall design (in conjunction with an architect), and experience requirements for the contractor.

Beyond that, put in the extra effort to stretch every dollar as far you can. Use existing relationships and work to create new ones that can be symbiotic or mutually beneficial throughout the process. During our renovation, we took advantage of a great relationship with the City of Columbus Recreation and Parks Department. They were able to use the milled-off turf and organic layer for compost and topdressing on their native soil fields, and were able to recycle our infield material for use on several of their fields. This saved us tens of thousands of dollars in disposal fees, and they were able to acquire hundreds of tons of materials at no cost.

When you are designing your field, make sure you work in conjunction with an (landscape) architect who listens to your concerns, understands the exact changes you want to make, and helps create a plan specific to your facility, rather than simply transferring a cookie-cutter design that may or may not have worked at countless other facilities. Make sure to do your homework before hiring an architect; ask for references, and use them. Call previous clients of that architect and don't be afraid to ask tough questions about their results and the pros and cons related to that firm.



*Trench drains being set by the concrete contractor.*



*Trench drains getting finish concrete.*



# JOHN MASCARO'S PHOTO QUIZ

## ANSWER

From page 17

I was visiting some stadiums in China when I came upon this process, and I had to take a couple photos. This soccer stadium is located in a transition zone, and was planted with a ryegrass and bluegrass mix for winter and spring play. After the spring, it was decided to convert the field to bermudagrass for the summer. Many sports fields simply have a base of bermudagrass and overseed with cool-season grasses. This particular stadium was growing a straight cool-season blend of turfgrass for this time of year. Then, using a sod cutter and lots of manpower, they cut the turf into strips, rolled up the turf, and hauled it off the stadium field. This is what caused the painted soccer penalty arc on the photo page to no longer be in a straight line. After the removal of the cool-season sod, they installed thick cut bermudagrass sod for summer and fall play.

Photo from John Mascaro's collection.

John Mascaro is president of Turf-Tec International



If you would like to submit a photograph for John Mascaro's Photo Quiz please send it to John Mascaro, 1471 Capital Circle NW, Ste #13, Tallahassee, FL 32303 call (850) 580-4026 or email to john@turf-tec.com. If your photograph is selected, you will receive full credit. All photos submitted will become property of SportsField Management and the Sports Turf Managers Association.

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*Old infield dirt being removed.*

Additionally, if you feel overwhelmed or simply don't have the time or background education to put this entire plan together, you may want to hire a qualified consultant to help guide you in the right direction and essentially act as your (organization's) "agent" through the design and construction process. A good consultant can help with everything from quality control testing to detailed design ideas.

When preparing for a renovation, you must also get a firm understanding of logistics. Are there height, width or weight restrictions for equipment while accessing your field or facility? Is there more than one access point? Do you have any paved or open area on the property where materials can be stockpiled during removal or install?

With our renovation, there was a separation between fixing the major issues and adding desired characteristics. Each of those would need to fit within the budget – some ultimately being put off until future projects. The two

biggest problems from the original build were grading and drainage issues.

Our original build had the infield set up extremely high as a plateau, and then fell off steeply all the way around. There was nearly a foot of fall between the base paths and the dugouts, and there was also a steep grade off the back arc. This created a wide variety of maintenance challenges, as well as being awkward and sometimes unsafe for players. Additionally, the grade of the warning track fell from the wall to the grass, using the field as the active drain for not only all rainwater from the field, but also the majority of rainwater from the concourse that runs under the field gates and onto the playing surface. This caused major drainage issues, eventually resulting in the loss of games each season.

To address the surface grade, I first had to figure out exactly what we had. Our benchmark – the elevation point which could not change and where all measure-





*Foul territory re-graded showing the departure from the old grade.*

ments were based – would be the edge of our concrete shop floor adjacent to the field. The shop floor could not be raised due to costs, but especially because changing its elevation would eliminate access for tractor-trailers and large cranes, which regularly require access to the field for concerts and construction projects. Dropping the elevation was impossible due to a city sewer line that runs beneath the field just outside our shop door.

Next, I had to determine exactly how deep and what the elevation was for the drain tile, subgrade, pea gravel, and rootzone. While I had access to original as-builts, I didn't trust them, and took a wide variety of measurements myself. Small holes were dug throughout the field, and measurements were taken to document the depth and elevation of each layer down to the subgrade.

Once I had created an accurate representation of what currently existed and what could not change, it was time to determine what I wanted – and then figure out what was actually possible, both physically and financially. One of the very first characteristics that I became determined to accomplish was a pure conical grade. That means that from whichever point you choose as the center of your cone (the center of the mound for us), the grade falls exactly the same in every direction to create a perfect cone. Most fields are actually not constructed this way, but my reasoning was for extremely easy laser grading of the infield dirt and warning track in the future. With a conical grade, a conical laser can be set at that center point and all parts of the field can be graded using that single measurement with no break points or adjustments. Additionally, I wanted our warning track

to carry that pure conical grade downhill from the grass to the base of the wall all the way around the field.

The next step was determining a grade. My goal was to create a grade of somewhere between 0.20-0.25 percent. For those of you who don't understand how grade is determined, a 1.0-percent grade means that there is 1 foot of fall over the course of 100 feet of run. A 0.50-percent grade would be 6 inches of fall over 100 feet. A 0.25-percent grade would be 3 inches of fall over 100 feet.

I calculated where the new elevations would be with a 0.25-percent grade compared to our existing surface grade. For all calculations, I used a measurement of 270 feet from the center of the mound to the center of the doorway at our shop floor. Being that I wanted a 0.25-percent grade, that meant I had to multiply 3 inches x 2.7 to find that the

base of the center of the mound would be 8.1 inches higher in elevation than the edge of our concrete shop

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*Irrigation heads were relocated to 4'6" off edges.*

floor. In theory, that was perfect. In reality, it was impossible. That's because the existing elevation at the base of the center of the mound was slightly over 23 inches above the benchmark. It was both physically (because of the sewer line beneath our drainage system) and economically impossible to drop the elevation of the infield by 15 inches. If I wanted to keep my hopes for a pure conical grade, it was time to sacrifice my desire for a 0.25-percent grade and start getting creative. I created a spreadsheet that showed the elevations associated with an incredibly wide variety of grade options between 0.25 percent (8.1 inches) and 0.5 percent (16.2 inches) because I refused to go steeper than a half percent.

From there, I began to reference my other research on our existing field. I had found that across the infield grass, we had on average slightly less than 13 inches of

rootzone. After speaking with some incredibly smart individuals, I determined that a minimum of 10 inches of rootzone would be acceptable. So that brought the 23 inches down to 20 inches, leaving less than a 4-inch gap to a potential 0.5-percent grade.

I quickly became open to manipulating the right field corner where our shop entrance is located, and I eventually came to grips with the concept of having a small triangle of area in the right field corner warning track fall at a greater percent than the pure conical grade. So I recalculated using our benchmark +2 inches. This brought us to within 2 inches of the 0.5-percent grade that I was using as a hard cap.

To make up those final few inches of elevation, I began checking more depths all the way around the edges of the infield (back arc and base paths). Because





*Soil tests professionally taken to analyze rootzone throughout the process.*

the infield sat up on a plateau and fell off so steeply all the way around, it was determined that we could drop the elevation by approximately 3 inches of rootzone and still provide us with a minimum of 10 inches.

While this complicated the project and would certainly add time and cost, I now had a grading and elevation plan to propose to contractors. We would go with a 0.45-percent pure conical surface grade, or a fall of 5.4 inches over every 100 feet. From our concrete benchmark to the center of the mound, that would be a rise of 14.58 inches (5.4 inches x 2.7). The original elevation of 23 inches minus the 3 inches of rootzone brought us down to 20 inches. We raised the benchmark point by 2 inches, which brought us to 18 inches. If we then subtract the 14.58 inches of new grade, it leaves us with 3.42 inches to make up. With that original plateau design, we ultimately determined that we would completely remove the rootzone of the infield (and stockpile it in the outfield for re-use), remove and dispose of the pea gravel layer, then excavate out approximately 3.5 inches of subgrade beneath the infield to make up that 3.42 inches. Fortunately, the drain tile had been trenched very deeply into the subgrade, so removing 3.5 inches above it had zero impact on any drain tile.

If I had pushed to flatten the grade any more than 0.45 inches, it would have required that same type of excavation in a much larger area around the back arc and through foul territory, which would have added a significant amount of time and cost to the project.

While it was inconsistent and fluctuated in areas, our original outfield grade was in the neighborhood of 0.50 percent, which meant that in most places, it wouldn't be

modified by more than a few inches by changing to the new 0.45-percent grade, keeping costs out there relatively manageable. That wasn't the case in foul territory, particularly from dugout to dugout and behind home plate. Because the original design had such a steep grade in foul territory, we would need to raise the elevation of the warning track in much of foul territory by as much as 6 inches to fit the new pure conical grade. This also required adding another concrete step to each of the six dugout entrance points. If you piece that all together, you'll realize that we raised the elevation of the track by 6 inches while lowering the elevation of the infield by 6 inches. Because of that, the end result was noticeably different from the old field.

Once the final pure conical surface grade and elevations were determined, it was then time to determine how to remove surface water. The original design had a 4-inch vertical line come to the surface at every single point around the warning track where a lateral line met the pe-

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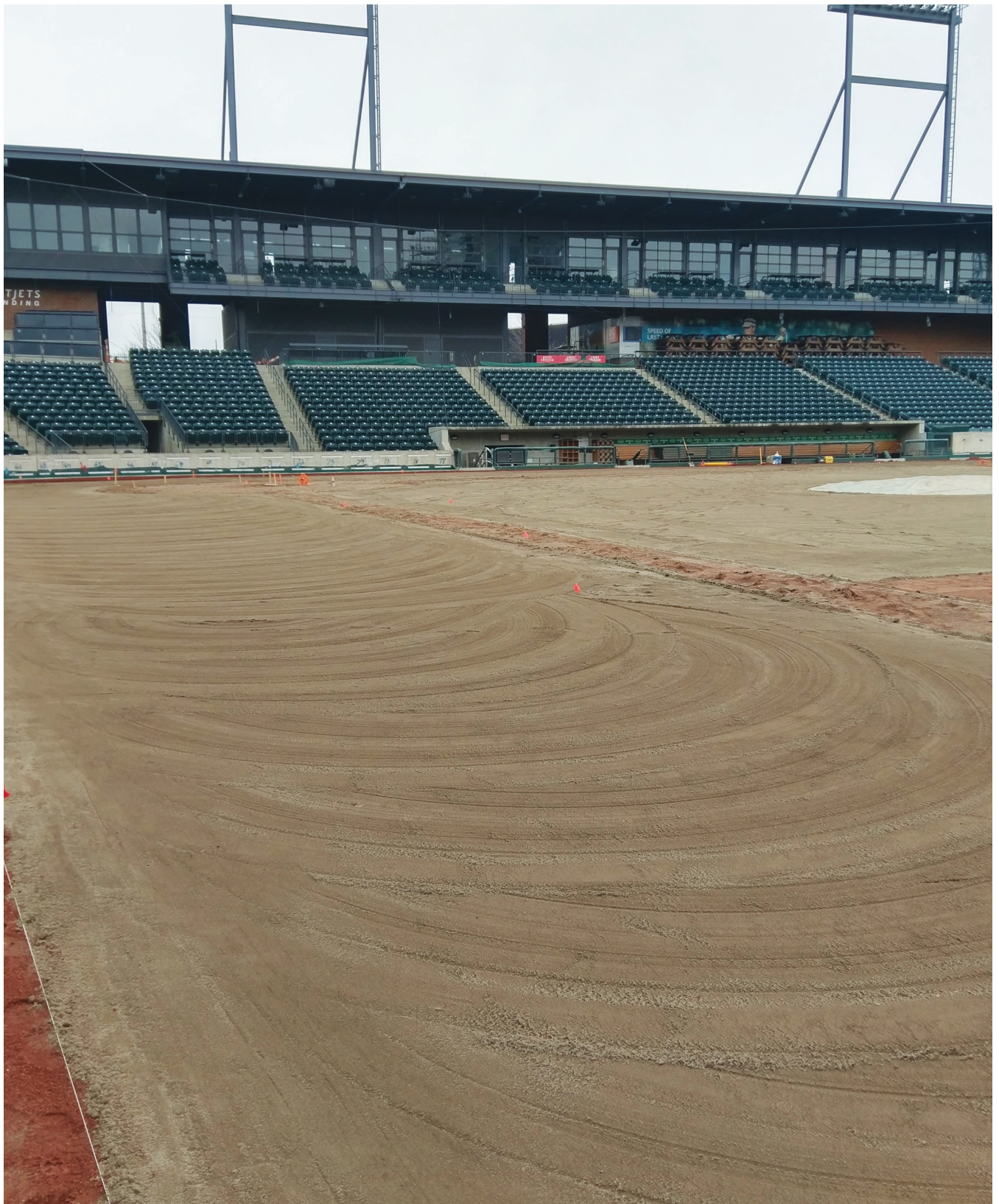
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*Final rootzone grade before sod.*



rimeter line. Because the track was originally designed to run toward the grass and those drains, every time they were opened in rain situations, they would fill with warning track material. Prior to the beginning of the renovation, we tested and cleaned out the entire existing drainage system in-house. As part of the renovation, each of those vertical drains were capped and buried. Each was marked with GPS, as well as having a large piece of metal buried with it. This way, any of them can easily be found by using either GPS locating devices or a metal detector. The same thing was done with eight tarp drains around the perimeter of the back arc. This eliminated a huge amount of points that needed to be avoided while aerifying the turf in the future.

After much research and visiting many facilities, it was determined that we would install a 4-inch trench drain at the base of the wall in strategic locations around the warning track. Again, because of the pure conical grade, all surface water would run from the center of the mound downhill

in every direction to the base of the wall around the entire perimeter of the field. For ease of maintenance and cleaning, the drains were set 4 inches off the wall and encased in concrete. I was highly impressed by the +/- 0.25-inch accuracy of installation in reference to the 0.45-percent conical grade. It was ultimately decided to install 420 linear feet of the trench drain in foul territory, split into five sections. An additional 140 linear feet was installed in seven 20-foot sections around the outfield. At the lowest end of each of those 12 sections was installed a catch basin and a junction where it was tied into the existing perimeter drain.

The vast majority of that trench drain was installed in foul territory for multiple reasons. During in-game rain events, the 170-foot by 170-foot tarp creates an incredible amount of surface runoff in those areas. Additionally, there are many points in which the rain accumulated on the concourse drains onto the field around foul territory. In the outfield, the turf and rootzone drains

**For ease of maintenance and cleaning, the drains were set 4 inches off the wall and encased in concrete.**

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the vast majority of water, requiring very little surface drainage. Also, the seating bowl does not access the field at any point around the outfield, meaning that we have no concourse drainage to account for.

When deciding on the 4-inch trench drain, a stainless-steel surface grate with 1/8-inch holes was chosen. This would be safe for players, as cleats could not get caught in the holes. Additionally, the holes are small enough to prevent a significant amount of warning track material, sunflower seeds, peanut shells, and other debris from getting into the drains and reaching the catch basins.

Two years later, I would recommend this exact trench drain system to anyone. The only change I would make would be to install and marry a sister perimeter drain around the field right next to the existing perimeter line and tie the entirety of the trench drain system into that isolated line.

During construction in the turf areas, 2 to 3 inches of sod layer and organic layer were removed by milling off. As previously noted, hundreds of tons of that material was given to an entity that composted it and eventually used it as a topdressing. The remaining rootzone was then tilled a minimum of two directions, then laser graded to a depth of exactly 4 inches below the new 0.45-percent conical grade. Throughout the process, tests were taken and analyzed at the lab to determine exactly what we had and exactly what we should add to it. It was ultimately decided to add a 3.5-inch cap (approximately 1,450 tons) of straight USGA sand (from the same source the provided the original rootzone). Once that cap was added and laser graded evenly across the entire field, the new USGA sand was then tilled into the existing rootzone, again a minimum of two directions. It was then laser graded to -0.5 inch of the new 0.45-percent conical grade. Prior to sod going down, more tests were taken and analyzed at the lab. The final results showed that at least the top 8 inches of our new rootzone was comprised of 96-percent sand including 1.1-percent organic material, with the remaining 4 percent being silt and clay. That raised our sand content by approximately 3 percent from original construction (93 percent) and removed the thick organic layer created (presumably) by using well water for irrigation. Vertical drainage has been improved significantly. We have noticed in the two years since the renovation that areas where the rootzone is thinner (approximately 10 inches), it dries out more quickly than areas deeper in the outfield and foul territory where the rootzone

can get as deep as 15 inches. This makes sense as there is more dense rootzone sand for the water to drain through before reaching the gravel layer below in deeper areas.

In a very last minute decision, I elected to essentially chop off the top of the cone and make the infield flat. In a 45-foot radius circle from the center of the mound, we made the surface grade of the rootzone perfectly flat. This makes nearly all of the grass inside the infield dirt and base paths completely flat. All the way around that 45-foot radius circle, the surface picks up that 0.45-percent grade and is completely unnoticeable to the naked eye.

While my heart was initially set on the 0.20- to 0.25-percent grade, I couldn't be happier with the 0.45-percent grade that we ultimately wound up with. It creates just enough surface runoff to help with the extremely heavy rains, but is flat enough to allow for even vertical drainage and holding of nutrients most of the time. From a playability standpoint, it acts as though it's completely flat and the players absolutely love it.

To fill that top 0.5 inch, we asked the sod farm to cut the sod as thin as they felt comfortable at the end of December. The sod was grown in New Jersey on a sandy loam soil and was a blend of four varieties of Kentucky bluegrass. Once the sod was laid, it was cleaned of stones and other debris. It was then rolled with our 1.5-ton roller, and topdressed with approximately

60 tons of sand. The following spring, the entire field was overseeded with 200 pounds of three varieties of Kentucky bluegrass (Hampton, Bewitched, and Noble). Those are the three varieties that we continually overseed with as needed due to wear or disease. We use an extremely small amount of ryegrass in season, but that is never applied more than 4 feet off any dirt edge (shortstop position, second base position, umpire spots, in front of the mound, and walk up edges around the plate). This way, a single piece of big roll sod can completely eliminate all rye from the field and bring us back to 100 percent KBG. No rye is ever thrown down the foul lines or in outfield position areas.

After our infield material was removed down to the subgrade, it was laser graded and compacted to exactly 4 inches below the new conical surface grade. A new 4-inch cap of custom professional highly engineered infield material was then installed. A 3-inch cap may have been sufficient, but if we are ever to modify the infield, I want to be able to till the top 3 inches and have a 1-inch buffer to prevent contaminating with any debris from the subgrade below.

**While my heart was initially set on the 0.20- to 0.25-percent grade, I couldn't be happier with the 0.45-percent grade that we ultimately wound up with.**



For the warning track, because we were changing elevations in many areas, we simply moved around the old warning track material to use as the base for the cap of new material. Similar to both the rootzone and infield areas, the warning track was laser graded to exactly 4 inches below the new conical surface grade. Because of the new trench drains, we were no longer looking for any vertical drainage down through the track, so the more compact we could make the base, the better. The new 4-inch cap was comprised of the same dyed lava rock, but with slightly different gradation. As the track ages, the lava continues to break down at the surface due to wear, creating a slightly tighter warning track. We keep the warning track saturated and occasionally rolled in an effort to keep it as firm as possible.

The overall irrigation design remained intact, as the layout worked well for us in the past. One change that was made was complete removal of the infield zone during the infield excavation, followed by a much more simplistic zone with four heads. The original infield zone had 20 total heads – four down each side, with an additional four around the mound. Not only was avoiding 20 heads while aerifying highly detrimental, those heads also created a cloud, per se, which often would soak a dirt edge when any wind was present.

We also have two dirt zones, one on the inside and one beyond the arc. Three total heads were eliminated during the renovation. Additionally, all heads and quick couplers along the back arc, as well as in several other locations, were moved 4 feet 6 inches off the dirt edge. Our aerifier is 48 inches wide, so this allows us to make a pass along edges without having to avoid irrigation heads.

As part of the new warning track installation, we chose to add four zones that cover the entire warning track. These heads are located just inside the trench drain at the base of the wall, and nozzles set to spray only the width of the warning track in that location. This saves us several hours of work for two to three employees most days. Regardless of any turf irrigation, we run the warning track irrigation every single night to the point of standing water to create full saturation and firmness in the warning track.

For all 12 quick couplers around the field, we eliminated the valve box that they were originally installed into and buried them directly into the turf, with the cap of the coupler at the surface. This creates a much smaller area to avoid with the aerifier. Additionally, we have found that the couplers remain much more stable in the ground, and are significantly less likely to snap when a crew member becomes overzealous and yanks a bit too hard on a hose.

There were plenty more considerations for our renovation than could be outlined here, as well as enough renovation wish-list items to fill another article, but the key takeaway from our project is to do your research,

and document the costs and benefits of every aspect for presentation to your organization.

In our situation, I had enough experience and confidence to push forward with my own design. I researched every single aspect of our field from the subgrade to the surface and noted any discrepancies on the as-built drawings. I spent two years reaching out to colleagues around the world, at all levels, in all sports, as well as to trusted vendor representatives. I asked the same questions over and over again, to well over 100 individuals, to make sure I understood every possible option that existed, as well as the costs and benefits of each. Using that information, combined with the understanding of the very specific issues at our facility, I pushed forward and designed our new field.

Remember, outside of a consultant, nobody is going to fight for you and specific parts of the project once budget cuts and cost overruns come into play. It is incredibly important to stay involved the entire way through and to make sure that the renovation actually improves your facility and your maintenance approach. **SFM**

*Wes Ganobcik is head groundskeeper at Huntington Park, home of the Columbus Clippers professional baseball team, Triple-A affiliate of the Cleveland Indians.*

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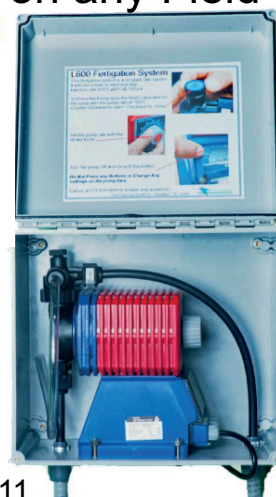
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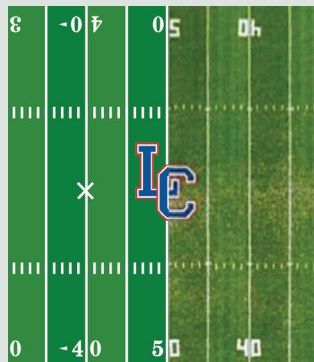
## THE CAMPEY LINE MARKER

The Campey Line Marker is a simple, durable and easy-to-operate liquid transfer line marker. Marking material is transferred from the 30-liter hopper to the 10cm-wide marking wheel by a grooved rubber roller, which allows marking up to post or flag. It has pneumatic tires and an adjustable flow rate giving even and accurate lines. The tubular steel handles can also be adjusted for operator comfort. Many professional sporting clubs in the UK and Europe, such as the Salford Reds, have the line marker. In the United States, sports facilities including the Philadelphia Union Soccer PPL Park stadium and the New York Mets' Citi Field use it regularly. The Campey Line Marker is even used in Costa Rica at the Estadio Alejandro Morera Soto, the home of Liga Deportiva Alajuelense.



## WORLD CLASS ATHLETIC SURFACES

World Class Athletic Surfaces has been "making the games look better" since 1988 with sharp, vibrant field graphics created with eco-friendly paints and patented custom stencils. The first of its kind, the "World Class Ready-to-Use Paint Tote System" delivers high-quality paint in 275-gallon totes with a built-in mixing blade to effortlessly mix paint, resulting in reduced man hours and brighter, consistent colors. The Paint Tote System saves on shipping costs, eliminates waste, and allows storage of more paint in less space. To reduce waste, World Class Athletic Surfaces will pick up empty totes at no charge to refurbish and reuse them. "Since we've come out with the tote system, we've taken approximately 15,000 paint buckets out of landfills," said Greg Narmour, vice president for World Class Athletic Surfaces.



## TRUMARK FIELD STENCILS

TruMark will help you make your vision a reality on the field. TruMark works in a collaborative manner to bring your team's logo, team name or mascot to life on the field. This includes guidance when converting a printable logo to a paintable one, offering professional mock-ups and a quick turnaround for quotes and production. TruMark will make the right recommendation on style of stencil and plastic used to ensure that you have the most accurate and longest lasting stencil. There are standard options for items such as end zone letters, number sets and hash marks, or TruMark can help design custom options to make your field one of a kind.



## NEWSTRIPE HASHMARK-MASTER 3400

The Newstripe HashMark-Master 3400 is specifically designed to fit the Graco LineLazer 3400 striping machine. The HashMark-Master 3400 quickly and easily attaches to the Graco FieldLazer 3400, making it a fast, efficient hash mark painting machine. It eliminates the need for repeated measuring or using stencils and templates that require a two- or three-man crew. One person can easily paint hash marks up to eight times faster than other methods. Made in the USA.





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### **TORO INTRODUCES PROLINE H800 DIRECT COLLECT ROTARY MOWERS**

Mowing and collecting clippings and leaves in a snap just got easier with the new ProLine H800 direct collect rotary mowers. The new ProLine series will be available to turf and grounds managers across North America through Toro's distribution network.

The ProLine H800 mower allows grounds crews to quickly mow and collect in a single pass thanks to the PLH 800's 50-inch cutting deck and Smart AirFlow system that transfers debris directly into the hopper. When the hopper is full, the cutting deck automatically shuts off to prevent overfilling. Dumping clippings is also a simple task thanks to the ProLine's 77-inch high lift dump-from-the-seat system, making it possible to dump clippings directly into the bed of a truck or dumpster.

Operators are ensured a full day of efficient, high-performance operation thanks to a 24.8-hp. Yanmar diesel engine, a 10.8-gallon fuel tank, top speed of 9.3 mph and a 1-cubic-yard high-volume collection hopper, offering the largest capacity in its class. In addition, the Toro ProLine 800 features heavy-duty caster forks, a tough welded steel bullnose bumper and long-lasting skid protection, all contributing to outstanding overall durability.

Engineered for maximum maneuverability in a variety of applications, the ProLine H800 has a 4-wheel-drive transmission with a locking differential and hydrostatic drive for optimum traction. It also offers a short turning radius and comes equipped with a foldable roll over protection system to avoid branches and other overhead obstacles.



### **SIDEKICK NOW AVAILABLE AT JOHN DEERE DEALERS**

Sidekick USA, manufacturer of a patented natural turf installation machine, announced at the STMA Conference and Exhibition in West Palm Beach, Fla., that its turf installation machine will be distributed through select John Deere dealers. The award-winning Sidekick machine will now be available through select John Deere dealerships in the United States and international markets for demos, leasing and purchase.

"We're so thrilled to bring the Sidekick's unmatched capabilities to a whole new audience, helping them create the most exceptional – and safe – athletic turf fields throughout the world," said Paul Carlson, CEO of Sidekick USA. "Through John Deere's extensive dealer network and distribution channels, the Sidekick can bring unprecedented, cutting-edge turf installation to a global market for improved playing surfaces around the world."

Through its patented design, the Sidekick is optimized to gently push thick-cut sod together during the installation process. The cut is approximately two inches thick, 48 inches wide, and can weigh up to 20 pounds per square foot – making it a challenge to tighten without the proper tool.

The Sidekick mechanizes and streamlines the installation process, speeding it up considerably. This also frees up field management teams to focus on other important areas of the install. Prior to the Sidekick, a full field replacement took about three days. Now, the entire process typically takes only one day with the Sidekick. After completion, the field can be ready to use the same day.





### RAIN BIRD INTRODUCES IQ4 CENTRAL CONTROL PLATFORM

Rain Bird's new IQ4 central control platform software provides full remote irrigation system access and numerous advanced water management features from any web-based device.

"For years, our IQ Platform has been an ideal water management solution for HOAs, schools, parks and other sites that require flow sensing, have more than 22 stations, or require comprehensive water management across one or more controllers," said Rick Malkin, central controls product manager for Rain Bird. "Now with IQ4, we're taking water management to the next level with full remote access, a modern user interface, streamlined navigation and permission-based, tiered-user access."

Available in English, Spanish, French, German, Italian and Portuguese language versions, IQ4 can manage small, single-controller sites as well as large multi-controller sites. The platform currently consists of two options: IQ4-Cloud and IQ4-Desktop. Each provides remote programming, management and monitoring of Rain Bird's ESP-LX Series Controllers (the ESP-LXME and ESP-LXMEF traditionally wired controllers, the ESP-LXD two-wire decoder controller and the soon-to-be-introduced ESP LX-IVM and ESP LX-IVM Pro controllers) from a desktop computer.

IQ4-Cloud also provides a web-based service that allows users to log in and control their irrigation systems from any internet-connected smartphone or tablet touchscreen. It's an ideal solution for organizations with multiple irrigation system administrators or users who are often off site.

IQ4-Desktop may be installed and operated on a single desktop computer, making it a good solution for sites with a single administrator who wants to control the irrigation system from his or her office.



### POLARIS EXPANDS LINE-UP OF COMMERCIAL UTILITY VEHICLES

The Polaris Pro XD is now gas-powered. With the addition of two new gas models to its Pro XD line-up, Polaris Commercial broadens the applications where the utility task vehicle (UTV) can be used.

Like the diesel models, the new Pro XD gas models provide seating capacity for up to four individuals, industry-leading payload of up to 2,075 pounds and towing capacity of 2,500 pounds. Designed for work across various off-road and on-road terrains, the gas-powered models are the ideal vehicle for increasing jobsite capabilities within the sectors of entertainment and events, municipalities, utilities and emergency response. The new models continue to provide the same best-in-class durability, serviceability and safety features with some additional model updates.

Pro XD vehicles lower total cost of ownership with heavy-duty components such as puncture-resistant seats and tires, commercial-grade wear components and heavy-duty suspension. These components provide customers with peace of mind that their vehicles will last through jobsite duty cycles and worksite abuse. Additionally, the all-new Pro XD gas models include a Polaris Pro-Star 1,000cc gas engine capable of enduring the harshest jobsite conditions.

The gas-powered models include the two-seat 2000G AWD with a payload of up to 1,900 pounds and the four-seat 4000G AWD with a payload of up to 2,075 pounds. The vehicles join the current Pro XD line-up of the diesel-powered 2000D 2WD, 2000D AWD and 4000D AWD.



The following are just a few of the many, many Tweets from the 2020 STMA Conference & Exhibition:



**@FieldExperts**

**JAN 12**

Getting underway at Howard Park with our friends at @ProjectEvrGreen. Over the next 3.5 hours, STMA members from far and wide will help leave a lasting impression in the West Palm Beach community. #STMA2020



**@MarkoftheKing25**

**JAN 14**

Good start to #STMA2020



**@CBSAFDirt**

**JAN 14**

Professional Baseball Field Renovation session. @ganobleberries sharing his experience and renovation history with a full room this afternoon. #STMA2020



**@turfgirl24**

**JAN 15**

The @UTturfgrass @FieldExperts turf bowl team is looking good in some Tennessee orange! Proud of the hard work these students have put in to prepare for today. Go Vols!





**@pioneerathletic**

**JAN 15**

Introducing: Pioneers in the Field. We're honored to announce the inaugural class of Pioneers. To read their full stories pick up The Pioneers in the Field book here at STMA or visit <http://pioneerathletics.com/pioneers>



**@Grassybrit**

**JAN 16**

Congratulations to @ZaneRaudenbush and the @OSU\_ATI\_Turf students for placing 3rd in the @FieldExperts Student Challenge!



**@JTurnour**

**JAN 16**

What an honor to have @iamrodneysmith at #STMA2020 as our keynote speaker. Truly inspiring story, and message, that he shared with @FieldExperts. The #50yardchallenge needs to make its way to DC.



**@msudawg2004**

**JAN 19**

With the temps supposed to be in the teens this week, I sure am going to miss that WPB weather!











**Q: Our bermudagrass fields are getting "spongy" from thatch. What is causing this, and what is the best way to deal with it?**

**A:** It sounds like you are beginning to accumulate thatch, which is an organic matter layer above the soil surface and below the turfgrass canopy. This layer is a combination of dead organic residues from the plant roots, crowns, and stems with the microbial biomass in some level of decay. Thatch accumulates when plant tissue production exceeds breakdown of the biomass with some level of accumulation expected due to the natural growth and death cycle of living plant material.

There are some benefits to thatch because it provides additional cushion for an athlete that impacts the surface. In moderation, it serves positively as an organic layer for holding pesticides and providing a good environment for desirable micro- and macro-organisms. But too much thatch, an amount not easily defined, can be bad, and may require management to limit further problems.

Thatchy turfgrass can have elevated crowns and roots growing in thatch that can reduce shear strength of turfgrass. This reduces surface stability and increases divoting and rip-outs. It can also result in reduced mowing quality, as the turfgrass will be more prone to scalping. A thick thatch layer can increase winterkill in turfgrasses, and result in hydrophobic spots on a field. A thick thatch layer can be a site of excessive disease inoculum, especially patch-disease-causing organisms. Lastly, excess thatch can limit air, water, fertilizer and pesticide movement into the soil, therefore reducing the effectiveness of your management program.

To optimally manage thatch, it is helpful to know the primary influences of thatch build-up. Number one on the list of influencers of thatch is excessive nitrogen. Plant tissue production is often in direct proportion to nitrogen applications. Next is typically excessive water/irrigation. Oxygen is necessary for aerobic microbial activity, so if the soil stays excessively moist then breakdown of organic matter may be slowed. Chemical imbalances, such as low pH (<6) or high pH (>8), can start to reduce microbes. With

fewer microbes, the breakdown of organic matter will slow. In a similar way, soil compaction can increase thatch since it lowers soil oxygen needed for microbial activity.

Higher mowing heights (more stem tissue) can contribute to more thatch. In a few cases, overuse of insecticides and fungicides may influence thatch accumulation. Although it seems logical that leaf clippings would be a major influence of thatch, research has shown that because leaf clippings are largely cellulose rather than the higher thatch-producing lignin found in crowns, nodes, stolons and rhizomes, leaf clippings are not a major contributor.

Thatch is normally prevented by controlling turfgrass growth with cultural practices that influence the items previously mentioned. This would include reasonable N fertility, adjusting soil pH, regular soil cultivation, and avoiding soil saturated conditions as much as possible. These practices, combined with regular dilution of the thatch with topdressing, are the best way to prevent the problem. Topdressing is the primary way to preventively regulate thatch levels. Also, high wear areas on fields may be void of thatch, whereas other the areas of the field may have elevated levels.

Regular use of wetting agents can be beneficial to limit some of the negative symptoms brought on by a moderate thatch layer. But once thatch starts to build-up, other than increasing sand topdressing frequency and/or amount per application, the only other way to control it is to mechanically remove it. In order of aggressiveness, one can use solid-tine types of cultivation (steel tine, water injection, air injection, shockwave, etc.), hollow-tine cultivation, vertical mowing, and fraise mowing. So, being less aggressive with growing inputs and more aggressive with cultural practices should reset your thatch levels. **SFM**



**Grady Miller, Ph.D.**

Professor and Extension Turf Specialist  
North Carolina State University

### Questions?

Send them to Grady Miller at North Carolina State University, Box 7620, Raleigh, NC 27695-7620, or e-mail [grady\\_miller@ncsu.edu](mailto:grady_miller@ncsu.edu)  
Or, send your question to Pamela Sherratt at 202 Kottman Hall, 2001 Coffey Road, Columbus, OH 43210 or [sherratt.1@osu.edu](mailto:sherratt.1@osu.edu)



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