



1st Quarter 2020

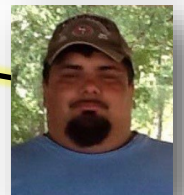
# TEXAS TURFGRASS ASSOCIATION

The 2020 Texas A&M Ecology and Management Short Course had another successful year with 31 attendees from the golf, sports, sod, municipal and commercial sectors of the Texas turfgrass industry. The TTA was proud to be a part of this education event that helped promote the CPTM Program! All attendees had the opportunity to join

the Texas Turfgrass Association and apply for the Certified Professional Turfgrass Managers Certification (CPTM).



Oklahoma



*We are proud  
to introduce  
18 of our newest  
members and CPTMs*

*More info on all of  
the new CPTMs on  
pages 7 - 15*

Keeping Texas Green SINCE 1947



## PLATINUM SPONSORS



## GOLD SPONSORS



## SILVER SPONSORS



Pump, Motors & Controls, Inc.

Pump Station Sales and Service



Bayer  
Environmental Science

## BRONZE SPONSORS



<b><i>President's Message</i></b>	
<b>Whitney Milberger - Laird</b> .....	4
<b><i>Executive Director Message</i></b>	
<b>Katie Flowers</b> .....	5
<b><i>Newest CPTM Recognition</i></b> .....	7- 15
<b><i>2020 Texas A&amp;M Ecology and Management Short Course</i></b> .....	15
<b><i>A protocol for data-driven golf course irrigation</i></b>	
<b>Chase Straw Ph.D.</b> .....	16
<b><i>Tracking Every Drop</i></b>	
<b>Chrissie Segars Ph.D. and Charles Fontainer Ph.D.</b> .....	19
<b><i>Summer Conference Announcement</i></b> .....	24
<b><i>Playing surface effects of water retention or penetration surfactants on creeping bentgrass putting greens</i></b>	
<b>Joey Young Ph.D.</b> .....	25
<b><i>Winter Conference Save the Date</i></b> .....	27

14



23



17



17



## ADVERTISERS

<b>2020 Sponsors</b>	2
<b>PMC</b>	10
<b>Turf and Soil Diagnostics</b>	12
<b>Bowlin Consulting</b>	12
<b>Larson Golf Services</b>	12
<b>Sod Solutions</b>	18
<b>Tri-Tex</b>	21
<b>Thomas Turfgrass</b>	27
<b>King Ranch Turfgrass</b>	28



Howdy Family,

We pray this quarterly magazine reaches you and yours safely. We are aware that many of you may have been furloughed or permanently let go due to the pandemic. Please remember to visit the job board located on the TTA website which we are continually updating for you.

Here on the Bay City farm, we've been fortunate to maintain a busy spring as Commissioner Sid Miller had requested Texas Governor Greg Abbott recognize the agriculture industry as an essential industry. We've received an accumulated INCH of precipitation since November so the mornings and eves are fueled by the sound of the diesel pumps seven days a week.

We are giving the grandkids a taste of what we did growing up by having them flag Bermuda and pick rocks out of fields we're sprigging.

Needless to say our kiddos finally have a new respect for those out in the field daily!



We are disheartened to cancel the summer conference but of course believe the well-being of our community comes first.

We do have exciting news for our members though that I'll let Katie have the honors of disseminating!

I want to reiterate that your

health and safety remain our top priority. We are focused on the health of our community, and finding ways to adapt our environment and practices to best serve the industry.

Gratitude goes to our Sponsors, Board, and Advisors for the dedication they've demonstrated while trying to bring you options on earning CEUs this year.

We also know the Winter Annual Conference will be even more inspiring as we'll see one another again. Make sure December 1<sup>st</sup> and 2<sup>nd</sup> are on your calendars for Frisco!

In closing, thank you all for your patience as we navigate the complexities surrounding COVID-19. We will continue to send updates, as needed, to provide TTA protocol and answer your questions on operations in the coming days.

Take things one day at a time, focus on what you can control, do the best you can, and we will get through this together.

With Best Regards,

Whitney Milberger - Laird



Howdy!

Like many of you, these spring months have turned into the most unexpected territory that all of us have professionally and personally been affected by. We are all still adjusting I am sure.

My Family had the pleasure of going Skiing in Colorado for our Family Spring Break trip the second week of March. We flew back into Texas right before the state stay-at home orders were announced but quickly saw the virus affects in our county. Before I knew it, I was homeschooling 3 children and finding my new professional routine affected like so many of you. I have been blessed to have adjusted well and I pray that each of you and your family have found your new "norm" and that the day-to-day is balancing out for you as best as it can. We steer our own ship when it comes to mental positivity and my greatest goal was to keep that positivity and get back to family life while working.



I understand the hardship our green industry has faced, and I want to make sure everyone knows how to utilize TTA for whatever job resources you may need. Our Job Board will remain open for members and non-members to help keep our industry at work. Please share my contact so all non-members can have that valuable resource for employment opportunities.

The biggest challenge TTA faced recently was the decision of the fate of our scheduled Summer Conference. As many of you know, TTA was set to be in Horseshoe Bay July 19<sup>th</sup> - 21<sup>st</sup> for our annual Summer Conference and Equipment Rodeo. In lieu of the COVID-19 and the uncertainty of the summer months, our Board of Directors and Summer Conference Committee came together to discuss the plausibility of the conference early on and some tough decisions were made.

To honor social distancing and acknowledge that many members were having their travel permissions halted, TTA agreed that we need to find a new way to provide education this summer and we have decided to go Virtual. Our Committee is currently planning a digital platform for our summer education and thanks to the help of some great out of state speakers, we will be able to honor all CEU credits for our members. Details will be released very soon but please keep July 20<sup>th</sup> and 21<sup>st</sup> marked for an innovative approach to education; our industry goal and purpose of TTA.

Warmest regards,

Katie Flowers

Your Executive Director

## Turfgrass Scholarships Available!

In an advancement of student development in the Turf Industry we are currently accepting Scholarship Applications! Apply today! [info@texasturf.com](mailto:info@texasturf.com)





## Executive Board



**President**  
**Whitney Milberger - Laird**  
Consulting, LLC - Milberger  
whitney.milberger@gmail.com



**1st Vice President**  
**Raymond Miller**  
Corteva Agriscience  
Raymond.miller@corteva.com



**2nd Vice President**  
**Jaxon Bailey, CPTM**  
GLK Turf Solution  
Jaxon.bailey@glkturfsolutions.com



**Past President**  
**Mike Chandler, MCPTM**  
Avery Ranch/Tervista Golf Club  
michandl7@aol.com



**Executive Director**  
**Katie Flowers**  
Texas Turfgrass Association  
katie@texasurf.com

## Region 1 Directors



**Scott Anderson, CPTM**  
City of Odessa  
Parks and Rec.  
sanderson@odessa-tx.gov



**Brian Noel, CPTM**  
City of Canyon  
bnoel@canyontx.com



**Rusty Walker, CPTM, CSFM**  
City of Grapevine  
rwalker@grapevinetexas.gov



**Houston Fullerton, CPTM**  
Hoots Lawn Care, LLC  
hoots@hootslawncares.com



**Clark Wheatley, CPTM**  
Greater Austin First Tee  
cwheatley  
@firstteeaustin.org



**Harry Jukes**  
Austin Turf and Tractor  
Harry@austinturf.com

## Region 2 Directors

## Region 3 Directors

## Region 4 Directors



**Greg Carroll**  
Irrigators Supply, Inc.  
greg@irrigators-supply.net



**Jeff Kadlec**  
GLK Turf Solutions  
keff.kadlec@glksolutions.com



**Craig Potts, CSFM**  
Texas A&M University  
Athletics  
CPotts@athletics.tamu.edu



**Gant Austin**  
POGO  
gant.austin@mctx.org



**Emory Thomas, MCPTM**  
Thomas Turfgrass  
Emory  
@ThomasTurfgrass.com



**Brad Bentsen, MCPTM**  
Mission Parks & Recreation  
bbentsen@missiontexas.us

## Region 5 Directors

## Region 6 Directors

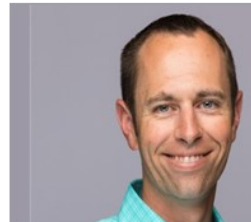
## Region 7 Directors



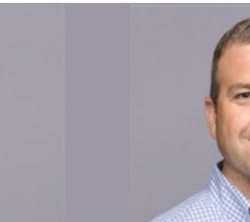
**John Cabori, MCPTM**  
Winfield United  
jmcabori@landolakes.com



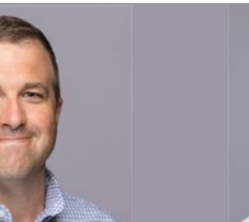
**Irene Gavranovic - Sipes**  
All Seasons Turf, Inc.  
irene@allseasonsturf.com



**Dr. Joey Young**  
Texas Tech University  
Joey.Young@ttu.edu



**Dr. Ben Werhley**  
Texas A&M AgriLife Research  
Ben.werhley@tamu.edu



**Dr. Hennen Cummings**  
Tarleton State University  
hcummings@tarleton.edu

## University Advisors



# Congratulations!

## New Certified Professional Turf Managers!



Nathanael Garner  
O'Brien Pro

Member of International  
Society of Arboriculture and Dallas  
Irrigation Association

Ricardo Govea  
City of Wylie

National Recreation and Park Assn. -  
Certified Playground Safety Inspector  
Has been employed at Wylie for 19 years.





## Tyler Sprowls The City of Wylie

Lead Chemical Applicator,  
Pesticide Applicators License.  
Husband and father of 2



## Shawn Ricks Huntington ISD

Custodian and Grounds Director  
Structural Pest Control and  
TDA License

## Rodolfo Vazquez Huntington ISD

Athletics Complex Groundskeeper  
Married 19 years and father of 2  
daughters - ages 11 and 18.  
Born and raised in East Texas







### Mike Perez McAllen Country Club

Class A-1 member of the PGA, with a B.A. in Psychology. Works closely with Class A GCSAA member for years as well as his predecessors.

### Jorge Mario Isaacs ABC Home and Commercial Services

Lawn Care Manager, Associate degree in Agroecology, Certified Applicator, Husband and father of 3.



### Hunter Sanderson Tri-Tex Grass

BS Agriculture, Natural Resource Management - Texas Tech  
Member - Turfgrass Producers International, Texas STMA

**Need Turfgrass Info?**

**texasturf.com**

## **PUMPING STATION SALES & SERVICE**



**PUMPS, MOTORS  
& CONTROLS, INC.**

**CLICK AD!**



PO Box 841383, Pearland, TX 77584

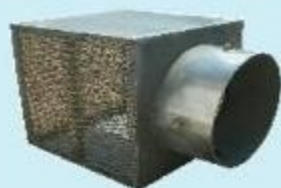
Office: 832-487-9463 Fax: 832-581-2186

Sales: 281-772-0362 Service: 832-256-8983

<http://www.pmc-service.com>

[info@pmc-service.com](mailto:info@pmc-service.com)

*Intelligent Use of Our Natural Resources*



- Inspections
- Intake Screens
- Wet Wells
- Foot Valves
- Floating Intakes
- Silt Removal
- Welding & Fabrication
- Pump Repair Shop

- Parts & Service
- Pump & Motor
- Control Valves
- PLC's & HMI's
- VFD Controls
- Conv. Controls
- Upgrades
- Retrofits
- Remote Monitoring





**Brett Gorgas**  
**YTL Inc.**

Agricultural Economics Degree,  
Texas A&M, Native Texan,  
Wife and 3 kids

**Anthony Constantine**  
**Meadowbrook Farms Golf Club**

Working in golf industry for two years  
and entering programs to further my  
career to become a golf course  
superintendent.



**Cody Blair**  
**SB Irrigation and Sod Farm**

Licensed Irrigator  
Oklahoma



## Grady D. Blount Blounts Sod Installation

President - Since 1991  
Texas A&M Green Professional  
Grew up near Royce City, Tx.



## David L. Lloyd SSC Service Solutions

RELLIS Campus Grounds  
Supervisor, Texas A&M University.  
Native of Amarillo, Proud husband

## Bryce Bortner Tri-Tex Grass

Member of Turf Grass Producers  
International and the Texas Sports  
Turf Managers Association







**CLICK AD!**

# Turf & Soil Diagnostics

supporting Texas turf (and landscapes) from the roots up!

Physical soil testing programs for  
golf, sports turf, and landscapes:



Soil Compaction and Drainage evaluations  
Sand-based and Native-soil Fields  
Rootzone Mix design and testing  
Baseball / Softball infield mix analysis  
Green Roof growing media  
Retention Basin / Structural Soil tests  
Aggregate testing  
Field Hardness - Gmax  
Golf Course bunker evaluations

**www.turfdiag.com**  
**phone: 855-769-4231**  
**email: lab@turfdiag.com**

## BOWLIN CONSULTING



Planning ♦ Design ♦ Mapping

### Stovy L. Bowlin, PhD

TCEQ Licensed Texas Irrigator #LI0009265  
IA Certified Irrigation Designer  
IA Certified Golf Irrigation Auditor  
(C) 512-560-0010  
stovy@bowlinconsulting.com

### Collaborating to Bring You Turnkey Irrigation Design & Consulting Services

New Construction & Renovation Projects;  
AutoCad Design; GPS Mapping; As-Built  
Drawings; Central Control Programming;  
Interactive Maps; Irrigation System Audits;  
Government Permitting; Water Demand and  
Water Use Analysis; Staff Training



### Robert K. Larson

(C) 903-244-8297  
rlarson@larsongolfservices.com

### Kyle R. Larson

TCEQ Licensed Texas Irrigator #LI0022226  
TCEQ On-Site Sewage Facilities Installer I  
IA Certified Golf Irrigation Auditor  
(C) 830-275-3247  
klarson@larsongolfservices.com

### Larson Golf Services Offers Comprehensive Golf Construction Services

USGA Greens Construction; Laser Guided Tee & Bunker  
Shaping & Construction; Total Golf Course Renovations;  
Irrigation Repairs & Maintenance; GPS As-Built &  
Mapping; Lake & Tank Construction

**CLICK AD!**



## Gabriel Doria City of Highland Village

Parks and Trails Field Supervisor  
Landscape Irrigator - Occupational  
License



## Phil Schmidt City of Highland Village

Athletics Crew Leader, Certified  
Pool Operator, Proud father of 3 kids  
and happily married for 19 years.

The Certified Professional Turf Manager (CPTM) designation recognizes a level of achievement in professional turfgrass management in Texas beyond a Bachelor of Science degree or a long tenure in the industry. The CPTM designation is a mark of distinction. Professionals who acquire the CPTM designation benefit the turfgrass industry and themselves through increased self-esteem and respect, increased value and service to their employer and increased competitiveness in the job market. By acquiring the CPTM designation, the professional turf manager sets himself or herself apart from other turf managers. For applicants to be considered for the CPTM designation and to maintain that designation they must provide documented evidence of turf management skills, participation in continuing education programs and successful employment in the turfgrass industry. Applicants for the CPTM designation are also required to satisfactorily complete a comprehensive written examination. An intensive 4-day training program in preparation for the examination is optional.





## Tyler Stegman Tri-Tex Grass

Proud TTA Member, CPTM  
Granbury, Texas

## Hayden Smith S&V Diamond Kuts, LLC

BBA Finance - Mays Business School,  
Texas A&M University, 2015  
Licensed Irrigation, Licensed Pesticide  
Applicator, Member TXSTMA



The 2020 Texas A&M Ecology and Management Short Course had another successful year with 31 attendees from the golf, sports, sod, municipal and commercial sectors of the Texas Turfgrass industry. The course was held March 2 - 5th at the Scotts Miracle-Gro Facility for



Lawn and Garden Research in College Station. With 14 unique AgriLife and Industry speakers, attendees had the opportunity to learn a range of turfgrass related topics from experts on each subject; spending time both inside and outside the classroom throughout the week. Topics covered included general turfgrass management, soil nutrient management, cultivation, and integrated pest management with in-depth content on weeds, diseases, and insects.



## A protocol for data-driven golf course irrigation

Chase Straw Ph.D.  
Texas A&M University



The golf industry is under increasing public pressure to improve environmental impacts by reducing management inputs, particularly irrigation water. The concept of site-specific management (also referred to as precision turfgrass management) is a viable strategy to achieve reductions by making applications only where, when, and in the amount needed. Many golf course superintendents already make site-specific irrigation applications, to a certain degree; for example, programming individual heads within fairways to irrigate more or less often than others based on perceived dry or wet areas. This answers some of the *where* question, but *when* water should be applied and *how much* to apply remain unanswered. Evapotranspiration (ET)-based irrigation scheduling (i.e. utilizing weather data to replace water lost from surface evaporation and turfgrass transpiration) is a proven method to reduce water use and can be an answer for the when and how much questions; however, it is difficult to account for small-scale spatial variations, which lead to “blanket” applications over entire fairways although certain areas may not require any water at all.

In-ground soil moisture sensors are currently available that measure soil moisture in real-time. The majority of these sensors are wireless and installed a few inches below the surface. Placing multiple sensors in designated areas throughout a golf course and monitoring the data can aid in irrigation scheduling once soil moisture values reach a threshold. GPS-equipped soil moisture sensors (mostly handheld) are also currently available and capable of obtaining georeferenced (i.e. identifying latitudinal and longitudinal location) point data for creating maps to identify soil moisture variability across a golf course. These maps can be utilized to determine soil moisture classes within management zones, where zones with the same class have comparable soil moisture values and can be irrigated similarly. Combined use of these technologies may assist in more precise, site-specific irrigation applications that could lead to significant water reductions beyond the ET-based irrigation scheduling method.

As of 2015, only 33% of golf course superintendents were utilizing soil moisture sensor devices (Golf Course Superintendents Association of America, 2015), and primarily the handheld versions on putting greens, which demonstrates that most are irrigating their golf course based on when they *feel it is necessary*. *The lack of adoption towards soil moisture sensor and mapping technologies is likely due to a combination of factors, such as cost, time, and lack of familiarity. Additionally, there is currently no available protocol to guide data collection for further analyses and interpretation.*

With all of this in mind, when I was at the University of Minnesota I worked closely with the Minnesota Golf Course Superintendents Association (MGCSA) to develop a free protocol that outlines step-by-step instructions to collect and analyze GPS soil moisture data, so that golf courses can have a baseline for developing a more data-driven irrigation management plan. The detailed protocol out-

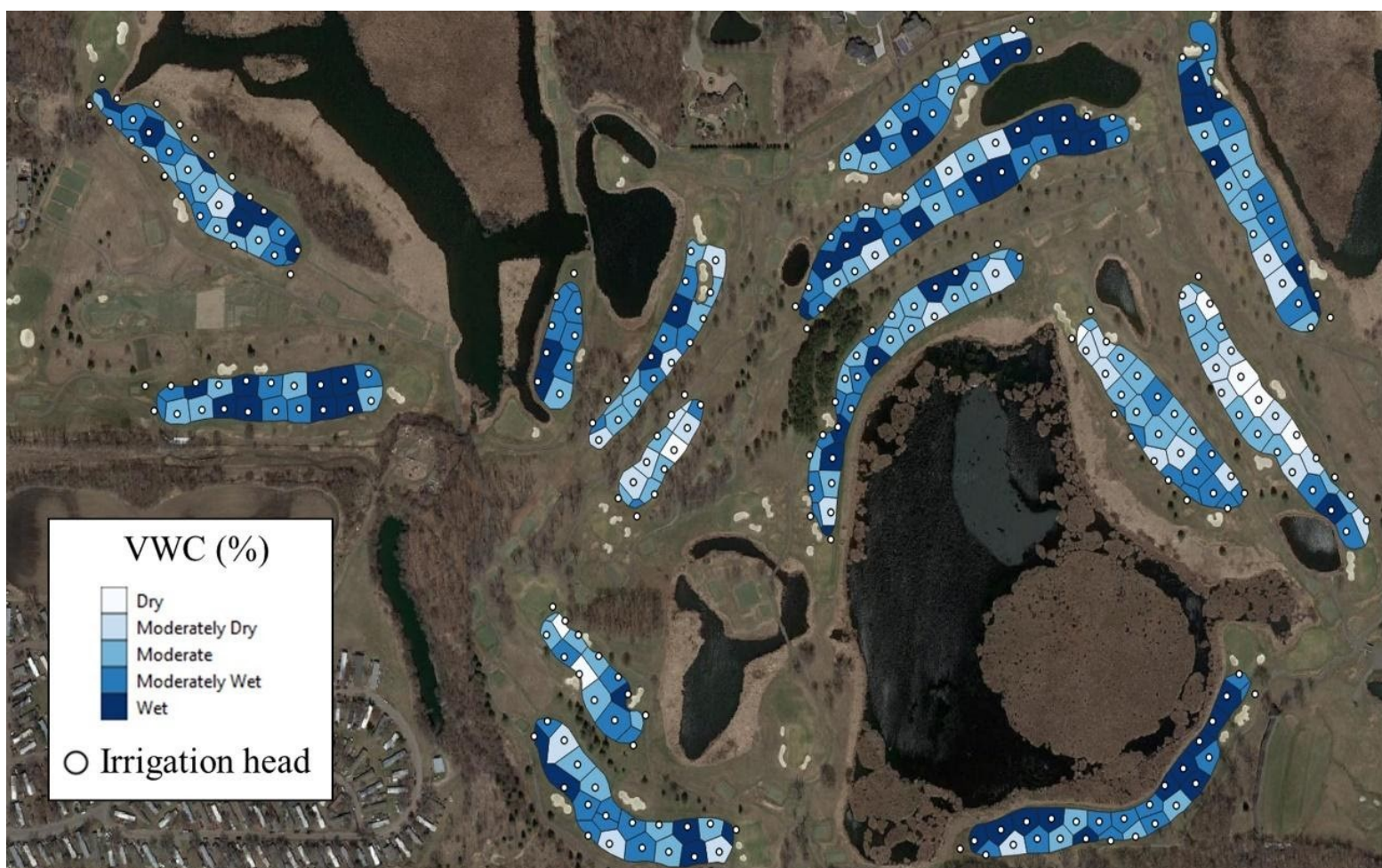


lines step-by-step instructions to collect georeferenced soil moisture data with a GPS-equipped soil moisture meter, which can then be used to create fairway soil moisture maps and irrigation management zones with free mapping software (Figure 1). A system was also put in place in Minnesota where those who do not have access to a GPS-equipped soil moisture meter can borrow a MGCSA- or fellow member-owned device.

The protocol is applicable to any type of golf course and to-date has been downloaded from golf course superintendents in 21 states, plus areas of Canada. Several positive outcomes are anticipated from this initiative, such as water conservation, reduced water cost, increased familiarity with new technologies, legislative appreciation, state agency acknowledgement with potential long-term impact on water priorities, and added membership value to local participating associations. The protocol is available for free through the University of Minnesota's Office for Technology Commercialization. It can be found by searching online for "golf course soil mapping protocol" or by the provided link in the "Useful Links" section of [aggieturf.tamu.edu](http://aggieturf.tamu.edu).

## References

Golf Course Superintendents Association of America. 2015. 2014 water use and conservation practices on U.S. golf courses.



*Figure 1. Final map after completing the golf course soil moisture mapping protocol, where irrigation classes have been assigned to individual irrigation heads based on surrounding soil moisture values (% volumetric water content; VWC).*





Let our 27+ years of grass development & expertise and our global network of over 250 producers work for you. Sod Solutions can be your one-stop-shop for all grassing needs — from selecting the variety that works best for your specific conditions to delivery, installation and maintenance consulting.



**SELECTION CONSULTING**



**SPECIFICATION WRITING**



**PRODUCT SOURCING**



**DELIVERY / INSTALLATION LOGISTICS**

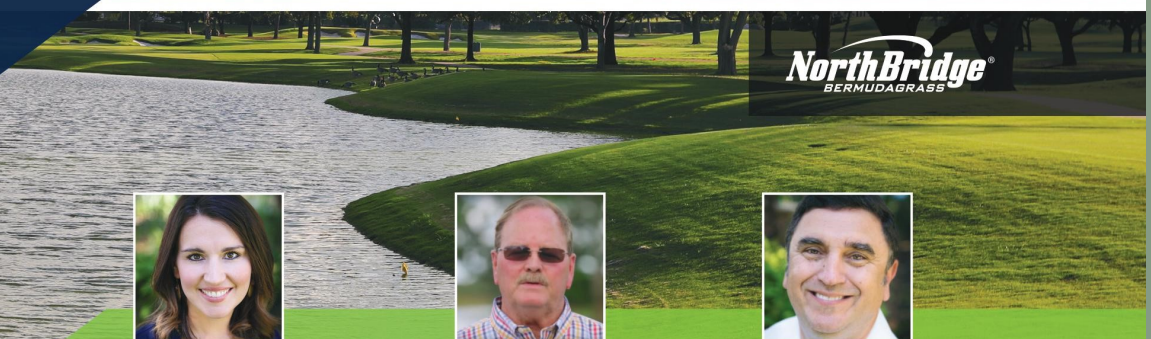
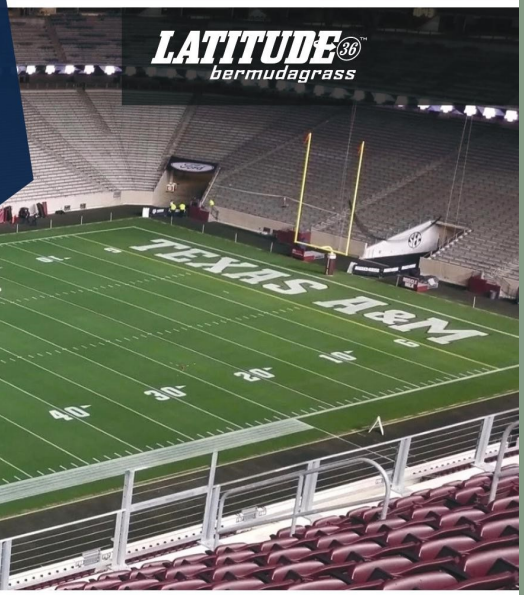
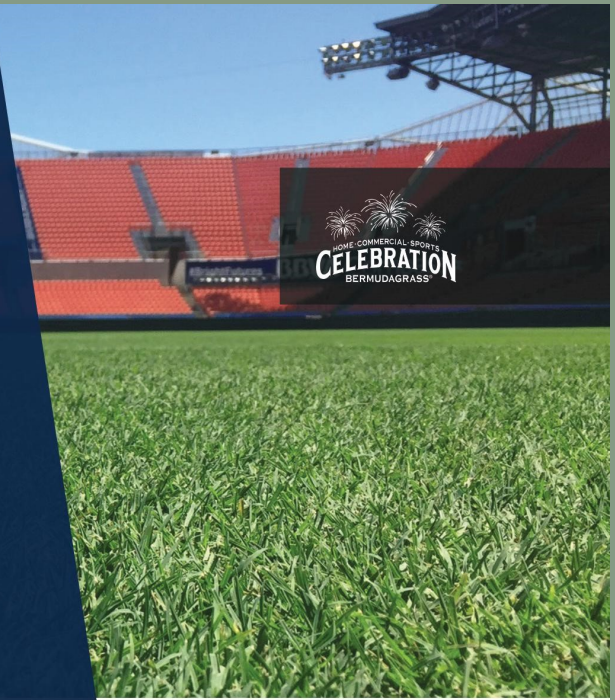


**FINANCING**



**MAINTENANCE CONSULTING**

**CLICK AD!**



**Erin Wilder**  
ewilder@sodsolutions.com



**Gary Bradshaw**  
gary@sodsolutions.com



**Roberto Gurgel**  
rgurgel@sodsolutions.com

**SodSolutionsPro.com**



## Tracking Every Drop Irrigation audits and troubleshooting for success

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



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.

### 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

Continued on next page



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.



Catch can for irrigation audits.



Catch can for irrigation audits.

## 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.”)



**CLICK AD!**



# **TIFTUF<sup>TM</sup>**

## **HAS UNLOCKED THE GREATEST POTENTIAL OF BERMUDA GRASS**

Specifically selected by renowned turfgrass researchers for drought and wear tolerance from 27,700 other genotypes. Strenuously tested for two decades under extreme stresses in both research and real world production environments.

A scientific breakthrough in performance and sustainability, TIFTUF<sup>TM</sup> Certified Bermudagrass uses 38% less water than Tifway and is more drought tolerant than Celebration<sup>TM</sup>, Latitude 36<sup>TM</sup> and all other tested bermudagrasses. Fine textured and dense, TIFTUF<sup>TM</sup> powers through cold, shrugs off traffic, spreads with incredible speed, greens up early and retains its color well into fall. Science has just delivered it all - TIFTUF<sup>TM</sup>.



*Use Who The Professionals Use*

**888-221-0422 | [TriTexGrass.com](http://TriTexGrass.com)**



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 (DULQ) (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 DULQ 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 DULQ of 67 percent, which would be considered acceptable but still leaving room for improvement. A DULQ 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.

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.

Calculating the DULQ 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).

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

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

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

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

Figure 2. Precipitation rate calculation.

#### Calculate Distribution Uniformity (DU)

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

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

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

Figure 3. Distribution uniformity Lower Quarter calculation.

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

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

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

Figure 4. Runtime calculation using the scheduling multiplier.

## 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 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 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.

Chrissie A. Segars, Ph.D., is assistant professor and extension turfgrass specialist at Texas A&M AgriLife Extension, Dallas, Texas.

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



Unsuitable irrigation pressure showing "donuts" on fields.

## 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 (DULQ):** 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.

## REFERENCES

- Hunter Industries Inc. 2012. Irrigation system design workbook.
- Irrigation Association. 2009. Irrigation audit guidelines. CLIA-CGIA.
- Moore, K., and J.Q. Moss. 2019. Managing pressure in the home irrigation system. OCES Factsheet HLA-6617.
- Sports Turf Managers Association. Conducting an Irrigation Audit.

## 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.



# THE 2020 TTA SUMMER CONFERENCE WILL BE VIRTUAL... SEE YOU ONLINE!



**2 DAYS OF ONLINE EDUCATION ON JULY 20 & 21**

**Due to Covid-19, we have moved our Summer Conference on-line to keep all our wonderful members and presenters safe.**

**Texas Turfgrass has engaged out-of-state speakers to provide top-notch education for this virtual platform!**

**SAVE THE DATES! July 20 & 21, 2020**  
**More info to come**

*E-mail or call Katie for more details!*  
**979.690.2201 • [info@texasturf.com](mailto:info@texasturf.com)**



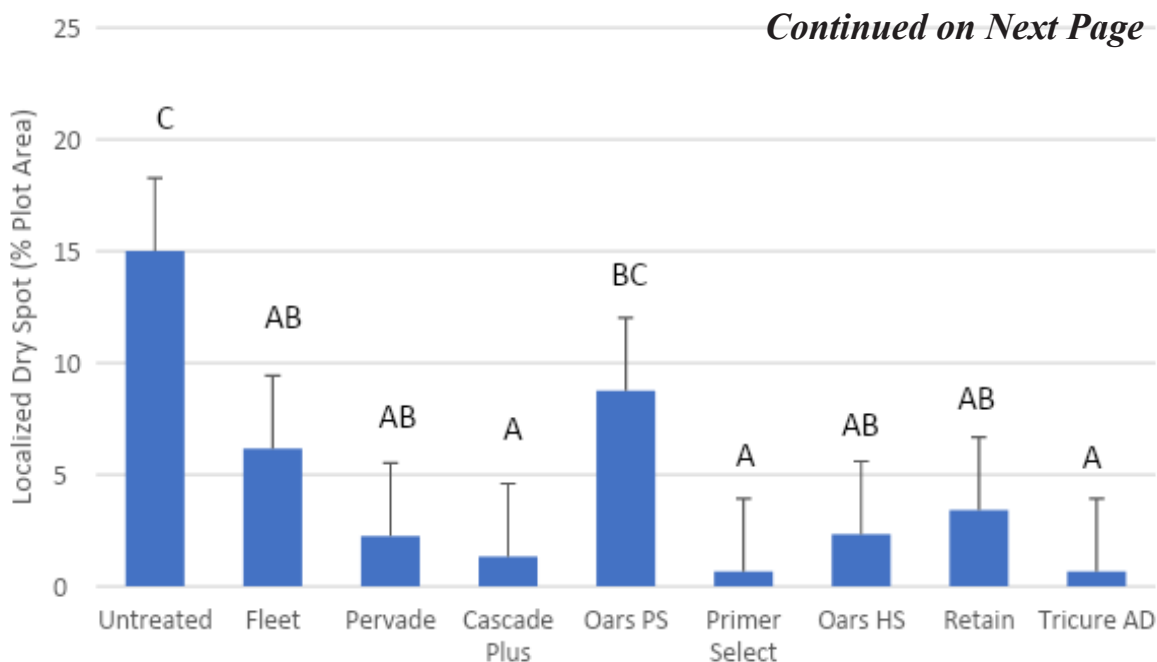
## Playing surface effects of water retention or penetration surfactants on creeping bentgrass putting greens

**Joey Young Ph.D.**  
**Texas Tech University**



A randomized complete block experiment was established on a California-style practice putting green with 16 inch rootzone containing 'Dominant Plus' creeping bentgrass at the Rawls Course in Lubbock, TX. The putting green was maintained between 0.125 and 0.135 inch cutting height with light topdressing and bayonet tine cultivation applied approximately every two weeks during summer. Irrigation was managed similar to other greens on the golf course receiving approximately 1.5-2 inches of irrigation or rainfall weekly, and handwatering following visual ratings when heat or drought stress was evident to prevent turf loss. Monthly applications of water retention (Primer Select, Oars HS, Retain, or Tricure AD) or penetration (Fleet, Pervade, Cascade Plus, or Oars PS) surfactants were applied at label recommended rates from April to October 2019.

Visual turf quality was recorded weekly with estimations of localized dry spot symptoms and dew formation rated when present. Volumetric water content (0.5, 1.0, or 1.5 inch depth) with TDR 350 and surface hardness measurements with a Clegg Impact Soil Tester helped assess surface characteristics with surfactant applications. Lastly, ball mark severity was evaluated through image analysis techniques to determine if surfactants affected depth of ball marks from a pneumatic golf ball launcher.



Visual estimation of plot area expressing localized dry spot symptoms when present within study area (mean of 3 dates where visible symptoms were present).

Bars sharing the same letter are statistically the same.

Visual turf quality was generally higher for water retention surfactants compared to penetrating products when combining all rating dates. This result was likely caused by increased localized dry spot symptom development with water penetrating surfactants as rainfall decreased and temperatures increased into July and August (Figure 1). Most surfactants had reduced localized dry spot compared to the untreated control, which demonstrates the benefit of surfactants in managing soil moisture for improved plant growth. Two sets of ball marks were created (18 July and 1 August) using a pneumatic golf ball launcher. There were no differences in ball mark severity on the first date. However, the untreated control (2.6%), Oars PS (3.0%), and Tricure AD (2.9%) had shallower ball mark depth than Primer Select (4.6%) and Retain (4.8%). Soil moisture content is related to depth of ball mark development, but soil moisture and ball mark depth affected recovery rates in a previous study (citation). Images of ball mark recovery are still being analyzed to determine if similar recovery characteristics will be observed in this more realistic setting. These treatments will be applied over a similar time frame in 2020 with continued data collection as described to determine if similar results are derived from an additional year of treatment evaluations.



Image 1. Post surfactant application and irrigation on 29 July. Variation in surface water formation on untreated control vs water movement from surface with different products following irrigation.

### Funding and thanks to the golf course.

Authors would like to thank Lone Star, Central, North, and West Texas GCSA Chapters for providing matching funds to support this project. Also appreciate the Rawls Course golf course superintendent, Rodnie Bermea, club house staff, and Troon Golf for allowing us to conduct this research at the golf course.





# Check out

# **LATITUDE<sup>36</sup>** bermudagrass



- Top-rated wear tolerance and recoverability
- Best shade tolerance of all bermudagrass
- Exceptional aesthetics
- Dense leaf canopy
- Early spring green-up
- Very good fall color retention
- Exceptional drought resistance
- Uniform and consistent color and growth

**CLICK AD!**

## 877.220.919

**Turfgrass and Installation for the Entire Great State of Texas!**

Amarillo - Lubbock - El Paso - DFW - Austin - San Antonio - Houston - Brownsville

## 2020 Winter Conference and Trade Show

**Embassy Suites  
Dallas / Frisco**

**Convention Center and Spa**



**December  
1st & 2nd  
2020**



**Save The Dates!**



**CLICK AD!**



## IS THERE A PERFECT ZOYSIAGRASS?

MAYBE SO... ASK ANY ONE OF THESE GROWERS:

- Billy Mayfield Farms
- Crittenden Turfgrass
- Double Springs Grass Farm
- Hussey Sod Farm
- King Ranch Turfgrass
- Modern Turf, Inc.
- Oakland Plantation, Inc.
- Pike Creek Turf, Inc.
- Professional Turf, Inc.
- Rhyne's Select Turf
- Turfgrass of Tennessee

Check out the #1 rated Zoysia at NTEP.org.

And, contact King Ranch Turfgrass for more info on the best performing Zoysia.



**#1 NTEP TESTED GREENS GRASS  
#1 IN PROVEN PERFORMANCE**

COMING TO A COURSE NEAR YOU  
Contact King Ranch Turfgrass for more info.



**KINGRANCHTURFGRASS.COM  
MINIVERDE.COM**

**713-287-2700**