

1st Quarter 2024

# TEXAS TURFGRASS ASSOCIATION



## 2023 Certified Professional Turf Managers

Great Work and Congratulations!

More information about these and other new Managers inside!



Zac Reynolds CPTM  
City of McKinney



Craig Robinson CPTM  
City of Plano



Justin Lovell CPTM  
City of Dallas



James Shields CPTM  
City of Lewisville



Jeremy Taylor CPTM  
City of Sherman



Patrick Greer CPTM  
City of Allen



Cheryl McLaurin  
Helena Agri



Kyle Saner CPTM  
City of Lewisville



Taylor Hawkins CPTM  
City of Plano



Nick McKenna CPTM  
Texas A&M University



J. Rex Robertson CPTM  
City of Plano

Keeping Texas Green SINCE 1947

## President's Message



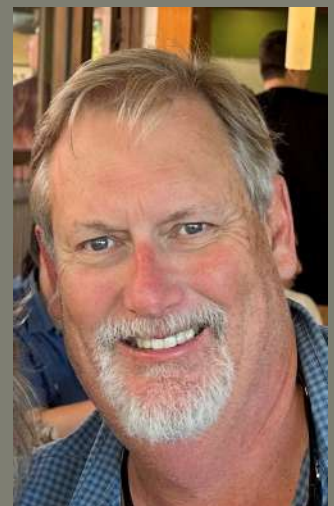
Hello. My name is Scott Sipes and I have the honor of being this year's TTA president. I became involved in the Sod industry 15 years ago when I married my wife, Irene Gavranovic-Sipes. The Gavranovic family owns All Seasons Turf Grass and Horizon Turf Grass with over 5,300 acres of sod production in Texas. Between All Seasons and Horizon, we supply sod to everyone from big box stores, municipalities, golf courses, sports fields, landscapers and even individual retail buyers throughout Texas and the surrounding states. All Seasons and Horizon are truly family-owned businesses with deep Texas roots and a passion for the Sod industry. It was this passion that led me to become involved with TTA and eventually your president.

TTA is looking forward to it a very exciting year with several events planned. The summer convention, which will be held at Kalahari in Round Rock, is destined to be a summer highlight with an emphasis on family and fellowship with other TTA members. It is a great opportunity to unwind and meet others in the industry in informal and classroom settings. Building on last year's winter conference in Frisco, TTA is excited to be hosting our winter convention in Corpus Christi. The Corpus Christi venue has proven to be an excellent site with great member participation, plenty of vendors and a chance to continue gaining valuable CEU credits.

**As you can see, TTA has an exciting year planned and I'm proud to be your president for 2024!**

**Sincerely,  
Scott Sipes**

A handwritten signature in black ink that reads "Scott Sipes".





<b>President's Message</b>	<b>Scott Sipes</b>	<b>2</b>
<b>Special Thanks</b>	<b>To Our 2024 Sponsors</b>	<b>4</b>
<b>Executive Director Message</b>	<b>Katie Flowers</b>	<b>5</b>
<b>2024 Board of Directors</b>	<b>University Advisors</b>	<b>6</b>
<b>2023 CPTM Designees</b>	<b>Congratulations</b>	<b>8 - 9</b>
<b>Save The Date</b>	<b>2024 Conference</b>	<b>10</b>
<b>2024 Sponsorship</b>	<b>Benefits and Registration</b>	<b>12-13</b>
<b>2024 Membership</b>	<b>Information</b>	<b>14</b>
<b>Turfgrass Article</b>	<b>Just passing through:</b>	
	<b>Turf colorants and light</b>	
	<b>Transmission</b>	<b>16 - 23</b>

# texasturf.com

<b>THANK YOU ADVERTISERS!</b>		<b>2024 Sponsor Page</b>	<b>3</b>
United Ag and Turf	7	Larson Golf Services	19
Sod Solutions	11	Turf and Soil	
Prime Sod	12	Diagnostics	21
King Ranch Turfgrass	15	Milberger Turfgrass	24



# Special Thanks To Our 2024 Sponsors!

## PLATINUM SPONSORS



## GOLD SPONSORS



## SILVER SPONSORS

## BRONZE SPONSORS



# Thank You!



Howdy and Welcome to 2024!

I am so excited to see how this great association can continue to thrive and promote the turf industry in 2024. Each Summer and Winter conference, we make strides to keep members and exhibitors engaged and educated in all realms of the turf industry, and I know this year will be no different. We will continue to keep education at the forefront and networking as a pivotal way to keep TTA as the “go- to” association in Texas. If you have a topic of interest in turf, an obstacle at your job, or just a common hurdle that needs to be highlighted and addressed, please reach out to myself or a board member and we will find a way to get this in our education line- up.



As you look ahead in your career, have you considered becoming a Certified Professional Turfgrass Manager? The CPTM designation recognizes a level of achievement in the Turfgrass management in Texas beyond a Bachelor of Science or long tenure in the industry. This distinction is proprietary to TTA and contributes to the growth of our members professionally. In this issue, you will see the newest CPTM’s that took the lecture and exam this past December in Frisco; Congratulations to you all! This winter, we will venture down to Corpus Christi on December 17<sup>th</sup> and 18<sup>th</sup>, and at the conference, we will hold the two-day lecture and exam for becoming a CPTM. I urge you to consider taking the next step and getting certified!

Before Corpus, I hope to see you all at our next event, the Summer Conference in Round Rock, July 14- 16<sup>th</sup>. Registration will open soon, and it is sure to be a great conference.

Lastly, an incredibly special thank you to all our Sponsors who keep this association going with your generous support.

**God Bless! Warmest Regards,  
Your Executive Director,  
Katie Flowers**







2024 TTA  
Board of Directors



President  
Scott Sipes  
All Seasons Turf  
281-788-9920  
Scott@allseasonsturf.com



Past President  
Houston Fullerton, MCPTM  
Owner: Texas Turf Services  
817-933-5250  
hoot@txturf.net



1st VP  
Randall Anderson  
City of Odessa  
432-638-8707  
randerson@odessa-tx.gov



2nd VP  
Brian Norton  
Deputy Director / Parks and  
Recreation  
City of Highland Village  
817-350-3344  
bnorton@highlandvillage.org



Executive Director  
Katie Flowers  
979-571-0372; 979-690-2201  
info@texasturf.com



Board Director  
Brian Noel, MCPTM  
City of Canyon  
806-341-2933  
bnoel@canyontx.gov



Board Director  
Jaxon Bailey, MCPTM  
Symmetry Sports Construction  
903-335-9069  
jebailey23@gmail.com



Board Director  
Brett Gorgas  
General Manager, YTL Inc.  
(817) 808-7820  
brett@ytline.com



Board Director  
Clark Wheatley, MCPTM  
512-712-3161  
clarkwheatley1@yahoo.com



Board Director  
Harry Jukes  
United Ag & Turf  
Director of Golf & Sports Turf  
Operations  
Office: 830-693-6477  
Mobile: 512-431-6923



Board Director  
Greg Carroll, MCPTM  
Ewing Irrigation  
469-408-5785  
gcarroll@ewingirrigation.com



Board Director  
Craig Potts, CSFM  
Sod Solutions  
979-739-4254  
cpotts@solsolutions.com



Board Director  
Jim Garrett, CGCS  
Regional Sales Representative  
PBI-Gordon Corporation  
972-623-8838  
jgarrett@pbigordon.com



Board Director  
Justin Thomas  
Prime Sod  
817-565-9960  
justin@primesod.com



Board Director  
David Gonzales  
210-831-2679  
gonzalesd2014@icloud.com



Board Director  
Travis E. Sales  
Director Parks, Recreation and  
Animal Services  
972-880-4234  
tsales@rockwall.com



Board Director  
Michael David Elrod  
GC Superintendent Class A  
Reeves County GC  
Pecos TX  
(915) 808-3409  
melrod@reevescounty.org



Board Director  
Mike Selman  
Buena Vista Turf Frams  
972-226-4029  
lmikeselman@aol.com



Board Director  
Ben Simpson  
General Manager- Heroes Lawn  
Care of The Woodlands  
281-254-0991  
bsimpson@heroeslawn.com



Board Advisor  
Joseph (Joey) Young  
Associate Professor of  
Turfgrass Science at Texas Tech  
University  
601-695-1331  
joey.young@ttu.edu



Board Advisor  
Ben Wherley  
Professor of Turfgrass Science  
Texas A&M University  
979-219-6774  
b-wherley@tamu.edu



Board Advisor  
Manuel Chavarria Ph.D.  
Assistant Professor &  
Extension  
Texas A&M University  
979-314-4653  
manuel.chavarria@ag.tamu.edu



# Master the Greens or Your Sports Fields with United Ag & Turf

Marble Falls  
(830-693-6477)

Farmers Branch  
(214-630-3300)

Bernalillo, NM  
(830-693-6477)



Transform your golf course maintenance into a seamless experience with our unbeatable selection of John Deere machinery designed to enhance every aspect of your course.

**CLICK AD!**

**UNITED** | **GOLF**  
Ag & Turf

[UnitedAgAndTurf.com](http://UnitedAgAndTurf.com)



# Certified Professional Turf Manager



# CPTM CERTIFICATION PROGRAM

## OVERVIEW

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.

## OBJECTIVES



To raise and maintain the professional standards of those employed in the turfgrass industry in Texas.



To provide effective continuing education programs for professional turfgrass managers.



To award special recognition to professional turfgrass managers who demonstrate a high level of accomplishment and skill.



To encourage professional turf managers to become active participants in the Texas Turfgrass Association.

*Congratulations to the newest CPTMs!*



**Cheryl McLaurin CPTM**  
Helena Agri-Enterprises

Cheryl McLaurin is a direct sales rep for Helena Professional, specializing in turf and ornamental in central Texas. Most recently in precision agronomy and as a lawncare operations/owner, Cheryl has worked in the green industry for the last 15 years. She is a graduate of Mississippi State University with a B.S. in Agronomy and a M.S. in GIS. In her spare time, she is a sports and band mom and can be found either cheering on MSU athletics or by the water in the off season.



**Craig Robinson CPTM**  
City of Plano

**Professional Organizations / Associations:**

Texas Department of Agriculture

Texas Turfgrass Association

**Degrees:**

B.A. in Business Administration,  
Grand View University

Certificate in Turfgrass Management, Rutgers University



**Patrick Greer CPTM**  
City of Allen  
The Courses at Watters Creek

**Professional Organizations / Associations:**

GCSAA Member  
Texas Turfgrass Association

**Other Information:**

Texas Department of Agriculture Non Commercial Political Pesticide Applicator License

**Brown Backstrom CPTM**  
Sports Field Solutions

Since 2021, I have been the sports turf manager for Sports Field Solutions at Baylor University, after previously holding the same position at the University of North Texas beginning in the fall of 2019.

Prior to working for SFS, I moved to Texas to be an assistant superintendent at the Vaquero Club in Westlake for 3.5 years after working with the Detroit Tigers as an intern in 2014 and a full-time seasonal staff member in 2015.





**James Shields CPTM**  
City of Lewisville

**Professional Organizations / Associations:**  
City of Lewisville - 18 Years

**Other Information:**  
Texas Department of Agriculture - Pesticide Applicator License



**Nick McKenna CPTM**  
Texas A&M University  
Assistant Athletics Director, Sports Field, Texas A&M Athletics

**Professional Organizations / Associations:**  
CSFM  
CPTM



**Taylor Hawkins CPTM**  
City of Plano

**Professional Organizations / Associations:**

City of Plano  
Parks and Recreation



**Justin Lovell CPTM**  
City of Dallas

**Professional Organizations / Associations:**  
Texas Turfgrass Association

**Other Information:**  
A Happy Dad!



**Jeremy Taylor CPTM**  
City of Sherman

**Civic Organizations:**

Polar Star Lodge #33  
Denison Consistory #191  
Polar Star Foundation

**Professional Organizations / Associations:**  
Texas Turfgrass Association

**Other Information:**  
Texas Department of Agriculture - Pesticide Applicator License



**Kyle Saner CPTM**  
City of Lewisville

**Professional Organizations / Associations:**  
Texas Turfgrass Association  
NRPA

**Degrees:**  
B.S. in Criminal Justice

**Other Information:**  
CPSI  
CPO



**J. Rex Robertson CPTM**  
City of Plano

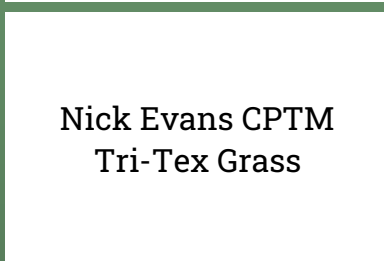
**Professional Organizations / Associations:**  
Dallas Irrigation Association  
Texas Irrigation Association

**Other Information:**  
TCEQ Licensed Irrigator  
TCEQ Licensed Backflow Inspector

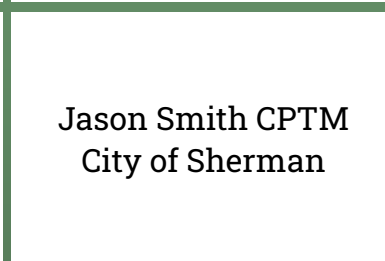


**Zac Reynolds CPTM**  
City of McKinney  
Ballfields

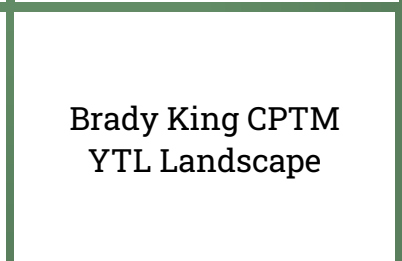
**Professional Organizations / Associations:**  
Texas Commission on Environmental Quality  
Texas Department of Agriculture  
**Degrees:**  
Motorcycle Mechanics Institute



**Nick Evans CPTM**  
Tri-Tex Grass



**Jason Smith CPTM**  
City of Sherman



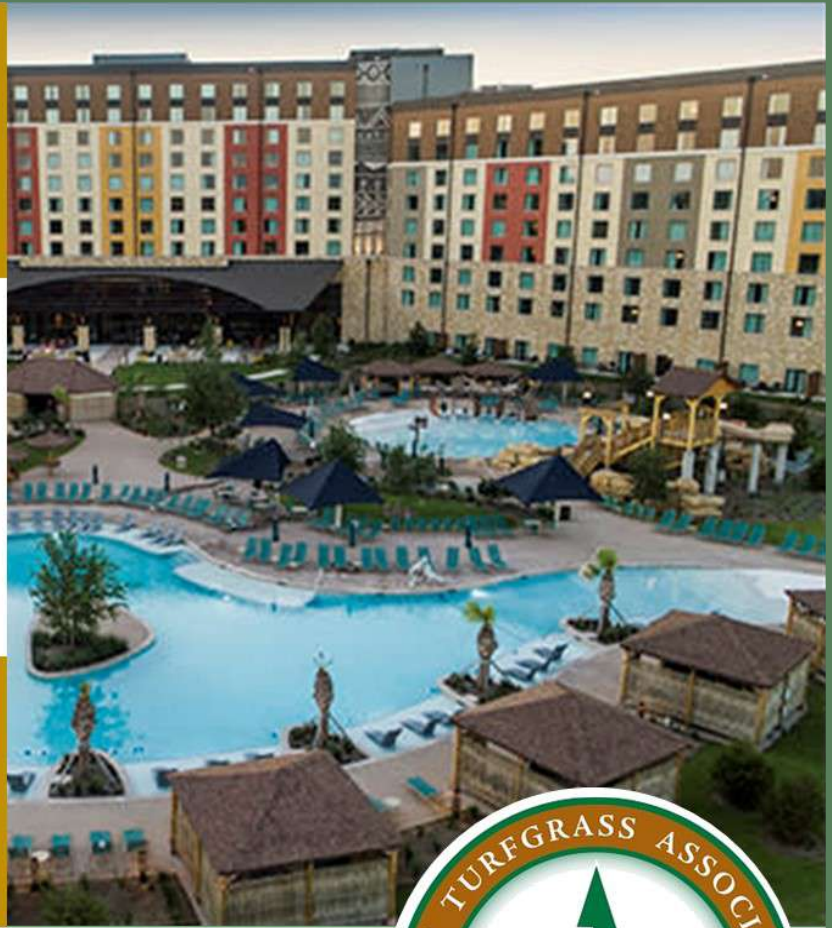
**Brady King CPTM**  
YTL Landscape



# Summer Conference



July 14 - 16  
Round Rock



## 2024 Conference Sites!

Save the Dates! Join at these great sites in 2024!



American Bank  CENTER

[www.AmericanBankCenter.com](http://www.AmericanBankCenter.com)

**Winter Conference**  
December 17 - 18 Corpus Christi



# Sod Solutions Hires Sam Greenwood for Sod Sales and Development

Sod Solutions is thrilled to announce the hiring of Sam Greenwood to pursue Sod Sales and Development actively. With over 40 years of experience in the turf industry, Greenwood brings a wealth of knowledge and expertise into his new position.



“I look forward to furthering Sod Solutions reach in the sod industry through expanding the sports venues that our grasses are in and strengthening our relationships within the industry. I am excited to be on the Sod Solutions team. I have worked alongside the company since it was started and have always been impressed with how they do business,” Greenwood said.

Greenwood’s career spans from 1983-2010 as a Sports Turf Manager at Quality Turf, where he was responsible for major installations, including Raymond James Stadium, to his role as National Production Manager for Golf and Sports Turf at Bethel Farms from 2010 to 2023. At Bethel Farms, he played a pivotal role in expanding bermudagrasses and growing the sales division significantly.

His profound understanding of the turfgrass industry, coupled with his extensive network ranging from golf courses to sports fields and public municipalities, makes Greenwood an asset to the Sod Solutions team. Sam’s involvement in prestigious projects like the Waldorf Astoria Orlando, Daytona 500 and various golf course renovations showcases his ability to handle high-profile turfgrass needs with excellence.

“We are excited to welcome Sam Greenwood to Sod Solutions. His remarkable experience and deep industry relationships are vital to our commitment to delivering top-quality turf solutions to our clients,” said Sod Solutions Chief Operating Officer Christian Broucqsault. “Sam’s expertise will be instrumental in advancing our product lines and reinforcing our market presence.”

Sam Greenwood’s role at Sod Solutions will involve leveraging his extensive experience to enhance product development, client relations and strategic growth initiatives.

*Sod Solutions has helped successfully develop and release to the market over 20 different turfgrass varieties over the past three decades including Palmetto<sup>®</sup> and CitraBlue<sup>®</sup> St. Augustine, EMPIRE<sup>®</sup>, CitraZoy<sup>®</sup> and Innovation<sup>®</sup> Zoysia and Celebration<sup>®</sup>, Latitude 36<sup>®</sup> and NorthBridge<sup>®</sup> Bermudagrass. The company is celebrating its 30<sup>th</sup> anniversary in 2024 and is based in the*

*Charleston, SC area. For media inquiries, contact Sod Solutions Media & Content Manager, Cecilia Brown at [cecilia@sodsolutions.com](mailto:cecilia@sodsolutions.com). Click [here](#) to read the article online.*



# Texas Turfgrass Association is introducing its Sponsorship Program for 2024 NOW!

This updated program is being released now and we would love for you to consider being apart of our association and its growth!

There are several ways to advertise and by choosing one of the TTA sponsorships, it will reach the entire green industry with a tremendous advantage.

Sponsorships are designed to enable your company to have more extensive and frequent access to our membership in order to promote your product/service.

Please review the below brochure and essentially pick the items that fit your marketing plan and target your customers! Find the value for your company!

We encourage you to take full advantage of all the opportunities available in the package to maximize exposure to your company through TTA.

Call or email me and I can walk you through this program at your convenience.

**Thank you for being apart of the Texas Turfgrass Association!**

*NO MATTER YOUR FIELD OF PLAY...  
PRIME SOD HAS GOT YOU COVERED!*

**EXCELLENCE  
IN SOD**

**CLICK AD!**



**CALL NOW! 817-243-8130**

**PRIMESOD.COM**







**Build your sponsorship that best fits the needs of you and your company.** Your company can essentially pick the items that fit the marketing plan and your target customers.

**Select Your A La Carte Options Below:**

- |  |   |
|--|---|
| \$125 - Annual TTA Membership (renewal rate)*        | \$800 - Newsletter Ads - Full Page Color Ad (1 issue) |
| \$650 - Winter Conference Booth Space (per booth)    | \$500 - Newsletter Ads - 1/2 Page Color Ad (1 issue)  |
| \$600 - Annual Conference Sponsor                    | \$250 - Newsletter Ads - BC Size Color Ad (1 issue)   |
| \$500 - Summer Conference Sponsor                    | \$350 - Website Link                                  |
| \$500 - Summer Conference Table Top                  | \$10 - Monthly TTA Tweet/Social Media Post            |
| \$300 - Equipment Rodeo - (If Offered)               | \$500 - Happy Hour Sponsor (per spot)                 |
| \$300 (Each) - Press Release in Quarter Publications | \$500 - Breakfast Sponsor (per spot)                  |
| \$25 - CPTM Maintenance Fee                          | \$500 - Lunch Sponsor (per spot)                      |
|  | \$500 - Annual Event Sponsor                          |

**Select Your Level**

**Platinum \$5,000 Plus**

**Gold \$4,000-\$4,999**

**Silver \$3,000-\$3,999**

**Bronze \$2,000-\$2,999**

***Commit by January 31, 2024 and get a 10% Discount***

# 2024 TEXAS TURFGRASS MEMBERSHIP



## MEMBERSHIP LEVELS FOR 2024 ARE AS FOLLOWS:

- Full Member: \$125.00
- New Member: \$150.00
- Lifetime membership: Comped ( Must have maintained membership of 30 years and be verified by Executive Director)

### New TTA Membership Levels

- Vendor Member: \$150.00 (Non-Trade Show Participant)
- Student Rate: \$25.00 (Must be currently enrolled in school and have a Max of 4 years)
- Retired Member: \$50.00 (Retired member that does not yet hit the Lifetime status. Must submit retirement status to the Executive Director prior to the discount being implemented.)
- AgriLife Extension Rate: \$50.00 (Extension Agents for their help and aid to TTA for Education)

### Enterprise Membership:

- Level 1: \$550.00 - Includes 5 Memberships from One Company, City Department, Golf Course, Vendor Company, etc. with each additional Member being \$105.00 (\$20.00 Discount)
- Level 2: \$1,000 - Includes 10 Memberships from One Company, City Department, Golf Course, Vendor Company, etc. with each additional Member being \$95.00 (\$30.00 Discount)





**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](http://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](http://KINGRANCHTURFGRASS.COM)  
[MINIVERDE.COM](http://MINIVERDE.COM)

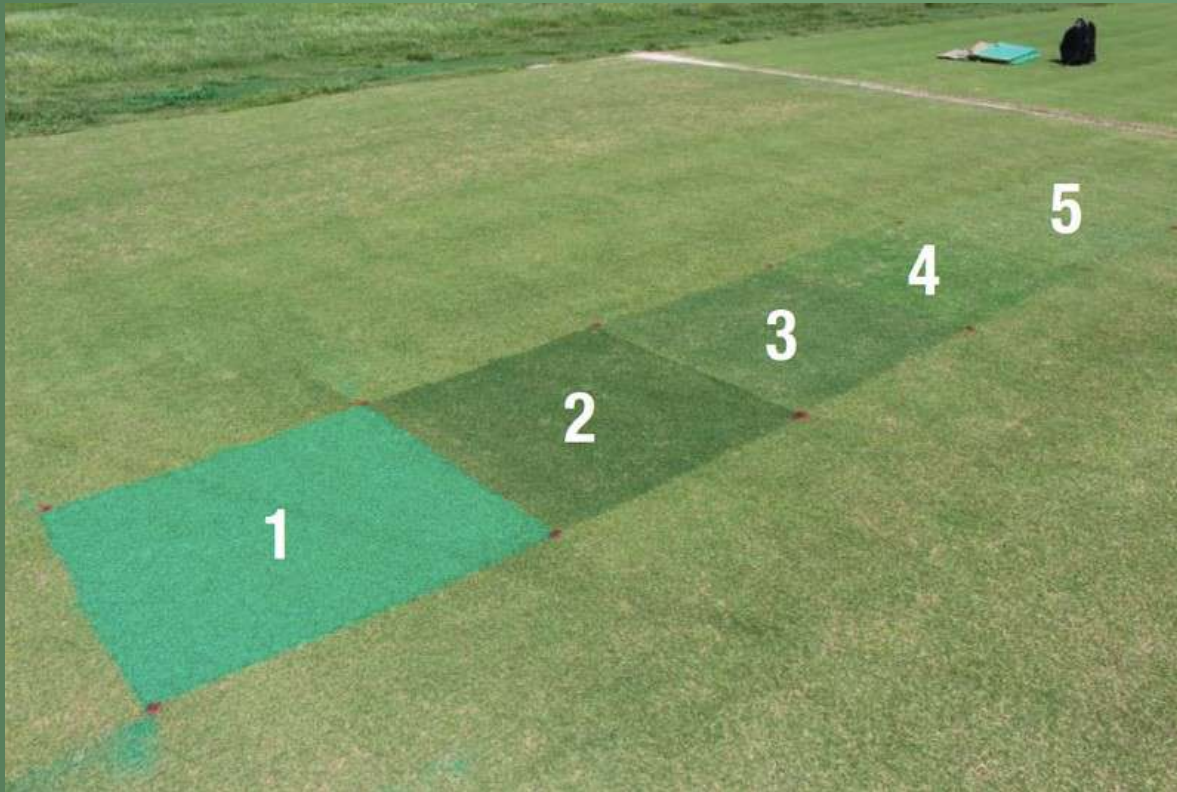
713-287-2700

# Just passing through: Turf colorants and light transmission



Expanded use of colorants beyond shoulder seasons and winter dormancy prompted researchers to investigate how such products affect light reaching turf.

September 2020 | Ben Wherley, Ph.D.; Manuel Chavarria, Ph.D.; and Casey Reynolds, Ph.D. 



**Figure 1.** The appearance of early-spring colorant treatment applications to ultradwarf bermudagrass. Left to right: long-term colorants (1, 2); short-term colorants (3); and fungicides with colorants (4, 5). **Photos by Casey Reynolds**

***Editor's note: This research was funded in part by GCSAA through a grant from the Environmental Institute for Golf.***

Turfgrass colorants have become increasingly popular for use on golf course putting greens, tees and fairways in recent years (1). Colorants are commonly used during shoulder seasons, times of the year when turf is not actively growing or is dormant because of suboptimal temperatures, but they are also used as a component of fungicides, tracker dyes and other turf products applied throughout the year.

Although published research on colorants is limited, some of the benefits of colorant applications may include replacing the need to overseed, enhanced color and definition, warmer soil temperatures, and more rapid spring green-up relative to overseeded turf (2). In addition, solar radiation reaching the soil surface has been found to be significantly greater under colorant-treated bermudagrass turf than perennial-ryegrass-overseeded turf during the early spring (3). However, there has been some concern that colorants may also have detrimental effects on plant health if applied during heat stress or if used in excess (3, 4, 5).



Turfgrass colorants can vary significantly in their chemical composition – which is based on their intended use – and in terminology (paints, pigments, dyes, colorants, etc.). *Colorant* is an overarching term that encompasses anything that provides color, which usually comes from organic or inorganic pigments, depending on the desired color and use. *Paints* contain pigments along with resin (also called binder) to hold the pigment in place on the leaf surface. They also contain much higher percentages of pigment because they are intended to last longer and provide a more drastic color difference. Paints are commonly used in the end zones and midfieldes of football stadiums, while colorants are more commonly used on golf courses and contain much less pigment and binder. (Some products used in this research are seen in Figure 1, above.)

Another important point to note is that organic and inorganic pigments in these colorants, with or without binder, are solid particles that retain their structure throughout the application process. Dyes, on the other hand, are organic substances that are fully soluble and do not retain any structure after application.

Although some colorants are suggested to filter the sun's ultraviolet (UV) radiation, arguably more important are their effects on photosynthetically active radiation (PAR), which is essential for photosynthesis. One concern of superintendents is the potential for colorant applications to excessively shade turfgrass leaves, particularly when the colorants are reapplied to close-cut putting greens during winter and early spring. However, little prior research has quantified the effects of colorants on transmission of sunlight.

### **Objectives**

The objectives of this research were: 1) to examine effects of long-term colorants, short-term colorants and fungicides with colorants on UV radiation (<400 nanometers) and PAR (400 to 700 nanometers) transmission from artificial light sources in the laboratory; and 2) to quantify colorant effects on actual PAR transmission from natural sunlight.

### **Approach**

This research was conducted during April and May 2018 at the Texas A&M Turfgrass Field Laboratory in College Station, Texas.

*Continued on Next Page*

## **Membership Texting- JOIN IT**

Texas Turfgrass Association is implementing a Texting System this year and I urge you all to opt in.

Please TEXT: **TTA2023** to **979-243-9239**

I will use for TTA events and notifications only.

This will be a great tool so emails don't get buried and you can stay informed!

## Lab-measured % transmission of UV and PAR wavelengths

Product (company)	Labeled spray-solution concentration (%)	% transmission	
		UV (200-400 nm)	PAR (400-700 nm)
<b>Long-term</b>			
Brite Stripe* (Pioneer Athletics)	25.0	<0.1	0.1
Match Play Ultradwarf (Pioneer Athletics)	7.0	<0.1	<0.1
Green Lawniger (BASF)	6.7	1.4	15.4
Harrell's Spray Max Dormant Green (Harrell's)	5.4	<0.1	1
Endurant Premium (Geoponics)	7.4	0.4	14.0
<b>Short-term</b>			
Turf Screen E.S.P. (Turf Max LLC)	0.9	0	0
Green Lawniger Vision Pro HD (BASF)	0.4	0	0
Green Lawniger Transition HC (BASF)	0.4	0	0
PAR SG (Harrell's)	0.2	<0.1	2.3
Endurant Turf Enhancer (Geoponics)	0.3	<0.1	3.9
Turf Mark Blue (spray indicator) (BASF)	0.1	12.4	29.4
<b>Fungicide with colorant</b>			
Appear (Syngenta)	4.1	37.3	57.6
Interface Stressgard (Bayer)	0.7	1.2	23.2
Civitas Turf Defense (Intelligro)	5.4	2.3	8.4

\*Brite Stripe is an athletic field paint included for comparison and not generally used on golf courses.

**Table 1.** Laboratory-measured percent transmission of UV (200-400 nanometers) and PAR (400-700 nanometers) wavelengths by long-term and short-term colorants and fungicides with colorants. Percent transmission data are for the lowest concentration tested (0.05%) and were measured using a PS-300 spectrometer equipped with both halogen and deuterium (SL5-DH UV-VIS) light sources. Data are the average of repeated experiments with three replicates per concentration (n = 6). Labeled spray-solution concentration is also provided for reference.

Percent transmission of light was recorded for each turfgrass colorant at each concentration. The procedure was repeated in time to ensure repeatability of data and generate additional data points for this phase of the experiment.

### Colorant effects on spectral transmission of PAR wavelengths from natural sunlight

Colorant solutions were prepared at mid-range product and mix volume rates provided on product labels (Table 2). Mixtures were applied to 0.12-inch-thick (3-millimeter-thick) clear acrylic sheets indoors using a handheld boom sprayer with XR 8002 flat-fan nozzles at 40 pounds/square inch (275.79 kilopascals). Desired spray volumes were achieved by calibrating walking speed during applications to a metronome. Three replicate sheets were treated with each colorant. Acrylic sheets were given 24 hours to dry.



Colorants were selected to represent a combination of available long-term colorants, short-term colorants, and fungicide products containing colorants (Table 1).

### Lab evaluation of colorant effects on transmission of UV and PAR wavelengths through solution

Turfgrass colorant solutions were prepared in the laboratory to final water:colorant ratios of 100:1, 250:1, 500:1, 1000:1 and 2000:1. These water:colorant ratios resulted in colorant concentrations of 1%, 0.4%, 0.2%, 0.1% and 0.05%, respectively. Three replications of each concentration were pipetted into 3.5-milliliter quartz cuvettes (standard 1-centimeter [0.39-inch] UV-grade cuvettes). Controls were also prepared that included cuvettes with and without deionized water. Water:colorant samples were then transferred to the laboratory for spectroscopic examination using a PS-300 spectrometer equipped with both halogen and deuterium (SL5-DH UV-VIS) light sources. This setup allowed for measurement of absorption and transmission of both UV and PAR wavelengths.

Colorant-treated sheets were then placed over the top of an open box that had completely closed sides and an interior painted matte black to reduce reflection/diffusion of transmitted light.

**Figure 2.** A close-up image of colorant-treated ultradwarf bermudagrass putting green turf showing the distribution of colorant mixture applied to the leaf surface.



A StellarNet spectroradiometer light sensor was positioned in the center of the box 1 inch (2.54 centimeters) below the acrylic sheet. Sunlight transmission through the treated sheets was then measured at solar noon on a cloudless day in late April 2018. For reference, PAR transmission was measured to be ~95% of full sunlight in the absence of colorant (untreated sheets). Colorant effects on spectral transmission properties, as well as overall energy transmitted within 400- to 700-nanometer PAR wavelengths, were then calculated for untreated controls as well as all colorant-applied treatments. The experiment was repeated in May 2018 using new solutions and acrylic sheets.

*Editor's note: How much light is enough light for your turf, and how can you best measure it? Get a rundown of the light requirements of various turfgrasses and a look at handy tools available for measuring light in [Measuring light for healthier turf](#).*

## Findings

### Colorant effects on transmission of PAR and UV wavelengths through solutions in lab

#### PAR transmission

Among the long-term colorants, percent transmission of 400- to 700-nanometer PAR wavelengths from the artificial light source through solutions in cuvettes was generally very low ([Table 1](#)).

Although a range of solution concentrations was prepared, most solutions allowed no transmission at concentrations of 0.1% or above. At the lowest concentration tested (0.05%), Green Lawngr (15.4%) and Endurant Premium (14%) allowed the greatest PAR transmission; of all the long-term colorants, Match Play Ultradwarf (0.05%), Brite Stripe (0.14%) and Harrell's Spray Max Dormant Green (1.5%) allowed the least transmission.

*Continued on next page*



**CLICK AD!**

---

#### **Kyle R. Larson**

TCEQ Licensed Texas Irrigator #LI22226  
(C) 830-275-3247  
klarson@larsongolfservices.com

#### **Robert K. Larson**

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

#### **Comprehensive Golf Construction Services**

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

#### **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

Retired Mentor

#### **Dr. Stovy L. Bowlin**

Honorary TCEQ Licensed Texas Irrigator #LI9265; Life Member Retired Irrigation Association  
Certified Irrigation Designer and Certified Golf Irrigation Auditor  
(C) 512-560-0010 stovy@austin.rr.com

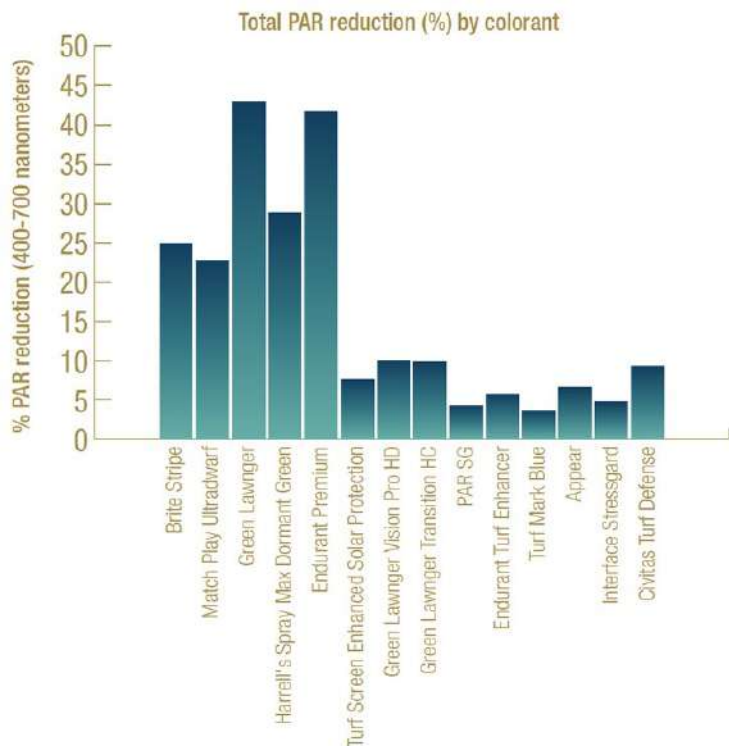
Solution concentrations tested were lower than those actually used in practice, but when extrapolating the data out to actual labeled tank-mixture ratios (colorant:water) – which, with the exception of Brite Stripe, would range from ~5% to 7% solutions – the data suggest that droplets of all products mixed in solution and sprayed in the field allow limited transmission of PAR. In practice, the entire leaf surface is rarely completely covered, but rather, droplets are typically scattered across leaf surfaces, as shown in Figure 2, below. Therefore, only areas of the leaf directly below pigment droplets may experience these reductions in PAR.

Short-term colorants also allowed limited amounts of PAR transmission at the 0.05% solution concentration (Table 1). Highest transmission was noted with Turf Mark Blue (29.4%), followed by Endurant Turf Enhancer (3.9%) and PAR SG (2.4%). Of the short-term colorants, Green Lawngr Vision Pro HD (0.5%), Transition HC (0%) and Turf Screen E.S.P. (0%) allowed the least PAR transmission. When extrapolating to label tank-mixture ratios, which ranged from 0.1% to 0.9% based on label recommendations, results were similar to those of the long-term colorants in that no transmission of PAR occurred through the majority of solutions at the label mixture rates. The exception to this was Turf Mark Blue, which was shown to transmit 30% PAR at the labeled mixture ratio of 0.1% solution.

Fungicides with colorants generally allowed the greatest amounts of PAR transmission in cuvette testing. PAR transmission for 0.05% solutions was greatest with Appear (58%), followed by Interface Stressgard (24%) and Civitas Turf Defense (8.5%) (Table 1). Again, when extrapolating data out to label mixture ratios, which range from 0.7% to 5.4%, limited to no transmission would be expected, and in this way, the fungicides with colorants also behave similarly to both long-term and short-term colorants.

### *UV transmission*

All long-term colorants significantly reduced incoming UV radiation (200 to 400 nanometers), as maximum UV transmission only ranged from 0% to 1.4% across long-term colorants (Table 1). Based on these data, at the label mixture volumes, which range from 5.4% to 25%, no transmission of UV radiation would be expected.



**Figure 3.** Total PAR (400 to 700 nanometers) reduction (%) relative to natural sunlight produced by long-term and short-term colorants and fungicides with colorants used in the study. All colorants were applied to clear acrylic sheets using the mid-label product application and carrier volume rate. Light measurements were recorded using a StellarNet spectroradiometer at solar noon on a clear day. The data were averaged over repeat studies conducted during May 2018 in College Station, Texas.



Interestingly, although Turf Screen E.S.P. is, to our knowledge, the primary short-term product claiming UV reductions, the majority of short-term colorants we tested excluded virtually 100% of UV radiation across all concentrations. The exception to this was Turf Mark Blue, which allowed 13% UV transmission at the 0.1% mixture rate. It is not known whether the same response would occur at higher concentrations and/or under natural sunlight conditions.

Fungicides with colorants allowed transmission of more UV light than both long- and short-term colorants (Table 1). UV transmission was highest with Appear (37%), followed by Civitas Turf Defense (2.3%) and Interface Stressgard (1.2%). However, as with most other colorants, no UV transmission was detected at label mixture rates for any product.

These results provided unique insights into the comparative transmissivity for both UV and PAR offered by these colorants. In order to extend these results to field situations, additional tests were performed by directly spray-applying colorants onto acrylic sheets at label colorant and mixture application rates followed by measurement of light transmission relative from natural sunlight.

### **Colorant effects on PAR transmission from natural sunlight**

Spectroradiometric measurements of PAR transmission through colorant-sprayed acrylic sheets was carried out as a means of providing a more realistic assessment of colorant effects on plant-available light under field conditions. As noted previously, these applications were made at mid-range rates and carrier volumes specified on product labels (Table 2).

*Continued on next page*

**CLICK AD!**



## **Turf & Soil Diagnostics**

Supporting Texas Turf (and Landscapes) from the roots up!

**Physical 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](http://www.turfdiag.com)  
phone: 855-769-4231  
email: [lab@turfdiag.com](mailto:lab@turfdiag.com)**

Spectral energy distribution curves of PAR transmission indicated differences among long-term colorants (data not shown). Green Lawngr and Endurant Premium showed similar responses in PAR transmission, providing the greatest reductions of the long-term products in blue (400 to 500 nanometers) and red (600 to 700 nanometers) transmission, with relatively less impact on green (500 to 600 nanometers) wavelengths. Match Play Ultradwarf, Brite Stripe and Harrell's Spray Max Dormant Green allowed noticeably greater transmission of red and blue wavelengths, and their effects on PAR were similar.

Short-term colorants allowed much higher levels of transmission across all PAR wavelengths relative to long-term colorants (data not shown), with the majority of PAR reduction again occurring in the blue and red wavelengths. Overall reductions in blue and red were most substantial with Green Lawngr Transition HC and Green Lawngr Vision Pro HD, with the least reductions seen with Turf Mark Blue and PAR SG.

Fungicides with colorants provided similar PAR reductions to short-term colorants (data not shown). Civitas Turf Defense and Appear led to the greatest blue and red wavelength reductions, while Interface Stressgard had only minimal effects on PAR, primarily in the red wavelengths.

### **Total PAR energy reductions by colorants**

When calculating the effects of colorants on total reduction of PAR (400 to 700 nanometers) energy transmitted through acrylic sheets, reductions of ~20% to 40% were noted with the long-term colorants relative to full sunlight (Figure 2, above). Consistent with the spectral energy curve data, Green Lawngr and Endurant Premium reduced total PAR by the greatest amount (43% and 42% PAR reduction, respectively). Harrell's Spray Max Dormant Green, Brite Stripe and Match Play Ultradwarf caused the next greatest reductions, which ranged from 25% to 28% of incoming PAR. Short-term colorants and fungicides with colorants caused only minimal reductions in PAR, which ranged from ~5% to 10%.

One drawback to this phase of the study was the inability to quantify effects of colorants on UV transmission as we had done in the laboratory. This was not possible because of the use of acrylic sheets, which naturally filter UV light. While all of the colorants appeared to fully restrict transmission of UV light emanating from a deuterium bulb when measured through spectroscopic methods, natural sunlight conditions may have produced different conditions and possible differences among the colorants.

### **Conclusions**

While traditionally used for color primarily during the shoulder seasons or during winter dormancy, colorants are now receiving more widespread use throughout the season on golf courses. Therefore, it is becoming increasingly important to understand their effects on sunlight, as this could directly impact plant performance in the field.

Based on the findings of this study, a number of differences were apparent between long- and short-term colorants, in terms of both chemical makeup and light transmitting properties. In spectroscopic lab analyses, all colorant solutions fully restricted transmission of both PAR and UV light at their labeled mix concentrations, but differences were apparent at lower concentrations. This phase of the study was designed to assess relative differences among products in a controlled lab environment.



As a result, the absolute values of these reductions are unlikely to extend to field situations, but the relative differences among the various colorants remain relevant.

Our study supports this conclusion in that, when a single colorant application was made to acrylic sheets at labeled application rates and sunlight was measured through spectroradiometric methods, long-term colorants caused 20% to 40% reductions in PAR, but short-term colorants led to PAR reductions of only 10% or lower. These observed reductions are consistent with previous research regarding colorant effects on photosynthesis (2, 3, 4) and suggest that caution may need to be exercised when colorants are used repeatedly or under low-light situations.

## Funding

This research was made possible through grant funding from GCSAA through the Environmental Institute for Golf and the Lone Star GCSAA Chapter.

---

## The research says ...

- Use of turf colorants (paints, pigments, dyes) – on their own and as a component of fungicides, tracker dyes and other turf products – has become more common on golf courses.
- Colorants can affect plant performance by restricting sunlight.
- In the field, long-term colorants reduced PAR by 20% to 40%, but short-term colorants reduced PAR by only 10% or lower.
- Caution may need to be exercised when colorants are used repeatedly or under low-light situations.

---

## 1 Literature cited

1. Briscoe, K., G. Miller and S. Brinton. 2010. Evaluation of green turf colorants as an alternative to overseeding on putting greens. *Applied Turfgrass Science* 7(1):1-8.
2. Hargey, D., B. Wherley, C. Reynolds, R. White and G. Parker. 2016. Performance of winter-overseeded and colorant-treated 'Tifway' bermudagrass receiving weekly irrigation and simulated traffic. *HortScience* 51(5):580-587.
3. Hargey, D., C. Reynolds, B. Wherley, R. White and J. Thomas. 2015. Overseeding and pigment impacts on bermudagrass spring transition. *ASA-CSSA-SSSA Annual Meeting Abstracts* 418-424.
4. McCarty, L.B., J.R. Gann, C.E. Wells, T.F. Bruce and P.D. Gerard. 2013. Physiological responses of creeping bentgrass to pigment-containing products. *Agronomy Journal* 105(6):1797-1802.
5. Reynolds W.C., G.L. Miller and T.W. Rufty. 2012. Athletic field paint impacts light spectral quality and turfgrass photosynthesis. *Crop Science* 52(5): 2375- 2384.

---

*Ben Wherley is an associate professor of turfgrass ecology at Texas A&M University, College Station, Texas; Manuel Chavarria is a research scientist at the Prairie Turfgrass Research Centre, Olds College, Olds, Alberta; and Casey Reynolds is executive director of Turfgrass Producers International.*

# Making a big splash with very little water.


**CLICK AD!**

Requiring 38% less water, TifTuf is redefining drought tolerance. In four years of National Turfgrass Evaluation Program drought stress trials, it outperformed Tahoma 31 and all other tested bermudagrass cultivars hands down. In fact, with the sale and installation of over 500 million square feet in just the past four years, TifTuf has saved over 9.5 billion gallons of one of our most precious natural resources, our Water!




**MILBERGER**  
**TURFGRASS**

## Contact Us

 +979-240-9462

 [tjmilberger@gmail.com](mailto:tjmilberger@gmail.com)

 [www.milbergerturfgrass.com](http://www.milbergerturfgrass.com)