Title: Development of Environmentally Sustainable, High Quality Turfgrasses through On-Site Golf Course Research

Project Leader(s): Brian Schwartz

Affiliation: University of Georgia

Objectives:

1. Evaluation of advanced experimental turfgrasses for putting greens under realistic management intensity and performance expectations.
2. Continuation of a GGEF sponsored student worker position in the UGA Turfgrass Breeding Program at Tifton, GA.

Start Date: 2016

Project Duration: 8 years (2016 – Present)

Total Funding: $86,500 to date

Summary Points:

1. 12-TG-101, an interspecific triploid hybrid bermudagrass (*Cynodon transvaalensis* × *C. dactylon*), was released from the University of Georgia's College of Agricultural & Environmental Sciences during the fall of 2021 and named 'Tif3D'.
2. 'Tif3D' generally has superior vigor to 'TifEagle' and 'Mach 1' during, or immediately following, periods of stress and is darker green than other ultradwarf bermudagrasses.
3. 'Tif3D' was planted at (9) golf course evaluation sites over the course of 2021, 2022, and 2023 in Florida, Georgia, and Louisianna within the scope of this research. Observations on establishment at different sprig rates, regional adaptation under low (0.125") to very low (0.075") mowing, and disease incidence were made.
4. Mr. Stone Stevenson, a Senior at ABAC, is the GGEF sponsored student worker at the UGA Turfgrass Breeding Program in Tifton, GA.

Summary Text:

'Tif3D' was selected from Taylor's Creek Golf Course at Fort Stewart in Georgia, home of the U.S. Army's 3rd Infantry Division and has been compared to 'Tifgreen', 'Tifdwarf', 'Champion', 'MiniVerde', and 'TifEagle' on the University of Georgia Tifton Campus since 2012. It is generally darker green and more uniform than these cultivars during, or immediately following, many environmental (drought, foliar disease, and temperature fluctuations during the spring and fall) or mechanical (mower scalping, verticutting, and hollow-core aeration) stresses. 'Tif3D' was highly adapted to the lower-intensity management conditions of the research trials in Tifton. Therefore, we further tested it at on-site golf course research putting green trials beginning in 2015, largely against 'TifEagle' and 'Mach 1'. Over years and locations, 'Tif3D' consistently outperformed these cultivars with its dense surface, eventually leading to its release at the request of several golf course superintendents.

Table 1. Summary of GGEF supported putting green trials planted at golf courses in Florida, Georgia, Louisiana, and South Carolina from 2021 – 2023.

Golf Course	Year Planted	Location	Golf Course Superintendent
UGA Golf Course	2021	Athens, Georgia	Scott Griffith
Palmetto Golf Club	2021	Aiken, South Carolina	Mark Swygert
Augusta National Golf Course	2021	Augusta, Georgia	Brent Seyer
TPC Sawgrass	2021	Ponte Vedra Beach, Florida	Jeff Plotts
Everglades Club	2022	Palm Beach, Floria	Brian Birney
Pine Tree Golf Club	2022	Boynton Beach, Florida	Joe Pantaleo
PGA Golf Club	2023	Port St. Lucie, Florida	Christopher Sykes
Belleair Country Club	2023	Belleair, Florida	Andy Neiswender
Southern Trace Country Club	2023	Shreveport, Louisiana	Graham Kornmeyer

2021

UGA Golf Course – This over 20,000 ft^2 test area of 'Tif3D' is used as a putting and chipping green for the UGA golf team. An estimated 80+ GA bushels per 1000 ft^2 planting rate was used, which is over twice the normal rate. Sprigs were not cut-in and rolled to maintain the shape of the final surface grade. During this grow-in, we compared normal irrigation against a misting irrigation that ran more frequently. After six weeks we decided there was not an establishment advantage where the sprigs were being misted and that the nozzles were in the way of other agronomic practices such as fertilizing, rolling, and mowing. This putting green established nicely, but we took note of an immediate organic layer forming, likely due to the heavy sprigging rate. In November of 2022 we began to notice dark spots scattered throughout the whole green. This was alarming, so we took many plugs from dark and light areas, grew them out in the greenhouse, and also performed tissue nutrient and genetic tests. After a few weeks in the greenhouse, the plugs equilibrated and differences were no longer obvious. DNA fingerprinting was negative, but 3x levels of Mn were found in the tissue of the dark green plants. The spots faded during the winter and have not been observed since. This green has many swells and can be challenging to mow. We have observed grain on the slopes on this green, and where mower patterns are hard to rotate. Scott keeps this green at speeds between 11 and 13 on the stimp meter for the golf team and continues to watch it in-case UGA decides to renovate the bentgrass greens on his golf course.

Palmetto Golf Club – 'Tif3D', 'TifEagle', and 'Mach 1' were planted on the "Pro" practice green, and there were enough 'Tif3D' sprigs to plant an approach for chipping. This green has shade pressure, and 'TifEagle' and 'Mach 1' lost canopy density. 'Tif3D' performed well on the green and several of the local Pros commented that the approach played well. Mark renovated his greens in 2023 and commented that he would have seriously considered 'Tif3D' had it been available.

Augusta National Golf Course – There may, or may not, be a putting green trial at this location.

TPC Sawgrass – A 5,000 ft^2 'Tif3D' green was established using a ~120 GA bushels per 1000 ft^2 planting rate without cutting-in to determine if faster establishment was possible for renovations in environments like on the 17th hole. Interestingly, 'Tif3D' established in 7 to 8 weeks, but almost immediately afterwards it was overseeded with Jeff's "secret blend" for the winter. Similarly to the UGA Golf Course test green, an organic layer formed, and rooting has been stunted on this green, which is in direct contrast to the results of the 2017 TPC Sawgrass putting green trials where the performance of 12-TG-101 was impressive. My takeaway from this trial can be summed up from a discussion Jeff and I had where he pointed out "Son, I'm glad your grass is doing great at Olde Florida, but I need it to perform here for me!" I agree with him wholeheartedly, and think this statement sums up the value this GGEF research project has had for our breeding program.

2022

Everglades Club – A low-input, 'Tif3D' test green was sprigged at a normal, 40 GA bushels per 1000 ft^2 planting rate without cutting-in next to an older 'TifEagle' nursery on the driving range. It is mowed regularly at greens height with thatch reducing maintenance as time allows. 'Tif3D' is performing well under these conditions. Brian plans to renovate soon and has concluded that 'Tif3D' is as good as 'TifEagle', if not better, but that a greens renovation will make or break his career. I respect his honesty when it comes to taking a chance on a new putting greens cultivar.

Pine Tree Golf Club - Joe Pantaleo has trialed many grasses over the years and agreed to grow-in a putting green of 'Tif3D' at the same time he sprigged his new 'TifEagle' nursery. This green established quickly in 2022, but was under drought stress during 2023 during the dry season. In this trial, 'Tif3D' and 'TifEagle' have performed similarly when stressed, although the dark green color of 'Tif3D' was apparent.

2023

PGA Golf Club – A practice green of 'Tif3D' in Port St. Lucie, FL is heavily used for chipping and putting. It was established at a standard sprigging rate of 40 GA bushels per 1000 ft^2, with a slow-release fertility program consisting of one application at planting intended to span the grow-in. Beginning in week 4, a quick release source of nitrogen and other elements were applied weekly to supplement the grow-in. The 'Tif3D' responded and was established by week 9. This green has 'Trinity' zoysiagrass collars that create a striking color contrast. 'Tif3D' has performed very well once transitioned to a standard maintenance program. Chris has recently applied Fusilade + Recognition to control 'Tif3D' encroachment into the 'Trinity' with success.

Belleair Country Club – In 2023, we provided 'Tif3D' and 'TifEagle' sprigs to plant a practice green that is shaded in the morning. 'Tif3D' established faster on this putting green, and has shown resilience to scalping and dry conditions. The environment on this coastal test site is taxing and will include water quality issues and seashore paspalum encroachment.

Southern Trace Country Club - We planted a 5,000 ft^2 practice green of 'Tif3D' in the late summer of 2023. This green grew-in and was playable by week 9, but shortly after, cold weather moved in for the winter. Graham noted that 'Tif3D' held green color longer than an older 'Mach 1' chipping green nearby. This spring he updated us that there was significant winter damage on the golf course, but that the 'Tif3D' had no winter kill and was greening-up.

Mr. Stone Stevenson is currently pursuing a B.S. in Environmental Horticulture on the Turfgrass & Golf Course Management track at ABAC. Stone has taken ownership of several putting greens field trials and has been instrumental in making sure they receive management similar to what is found on the golf course while under the supervision of Mr. Jonathon Fox. He also regularly maintains a breeder's field of an experimental zoysiagrass we are considering for cultivar release.