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TURF

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THE UNIVERSITY OF GEORGIA
COLLEGE OF AGRICULTURAL &
ENVIRONMENTAL SCIENCES

UGA**TURF**

Research from Georgia to the world

For more than 60 years, scientists with the University of Georgia College of Agricultural and Environmental Sciences have worked to provide research-based information for the turfgrass industry. The warm-season turfgrass breeding program began in the 1950s and continues today with programs focused on the development of sustainable bermudagrass, centipedegrass, zoysiagrass and seashore paspalum cultivars.

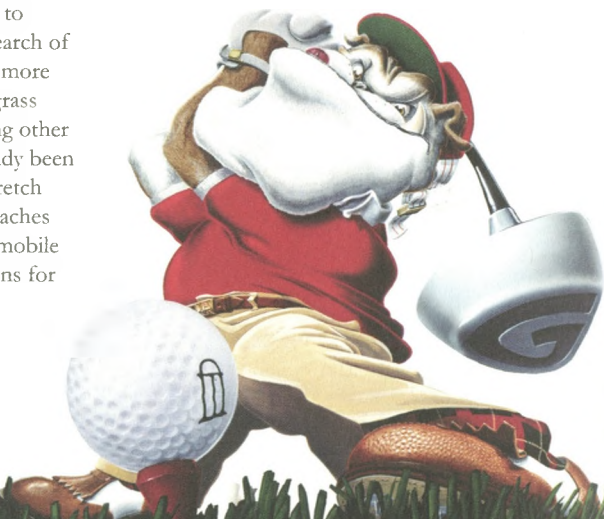
UGA-bred seashore paspalum covers golf courses along the world's coastlines. This species slowly grew into a popular member of the UGA turfgrass family. Tried and true Tif-varieties, like TifGrand, cover golf courses and sports fields across the nation and the globe. UGA's grasses have been used at some of the most popular sports venues like the Olympics and World Cup.

Turfgrass researchers at UGA continue to develop and evaluate new turfgrasses in search of cultivars that require fewer inputs and are more disease and pest tolerant. The UGA Turfgrass Team focuses on drought tolerance, among other traits, and some promising lines have already been identified. UGA scientists also strive to stretch the scientific boundaries with novel approaches to management and education, like using mobile sensing units or creating mobile applications for today's smartphones.

Turfgrass Extension specialists at UGA

extend this research to the general public and to the green industry to make research findings accessible to turfgrass professionals, homeowners and county Extension agents. UGA turfgrass faculty aim to train new scientists through the college's academic programs and prepare industry professionals to create a well-educated workforce.

Georgia's turfgrass and related industries are essential to the economic viability of the state, as they contribute more than \$7.8 billion annually to the economy and provide 87,000 full- and part-time jobs. Working together, the UGA Turf Team and the industry can continue a partnership that stimulates economic development, furthers scientific exploration and enhances environmental sustainability.



UGA-bred turfgrass thrives on world stage

Four varieties of University of Georgia turfgrass developed under Wayne Hanna's leadership in Tifton, Ga., thrive on the national and international stage: TifGrand, TifSport, TifEagle and TifBlair centipedegrass. Each has its own strengths that appeal to golf courses, sports field or home lawns.

TifEagle, released in 1999, is popular among golf course superintendents because it provides a smooth putting surface for golfers and is uniform in texture and color.

Cold tolerance and uniformity are what set TifSport apart. It's a versatile turf that can be used on golf courses, athletic fields and lawns.

There is an increasing trend for home lawns and sports fields, in addition to golf courses, to be planted in TifGrand because it can thrive in 60 percent shade and is tolerant of severe weather.

Hanna's successor, Brian Schwartz, says the newest UGA turfgrass, TifGrand, provides a unique, emerald green color and can be mowed at a wide range of heights. TifGrand is often used around greens and on shady tee boxes, providing superintendents with a strong color contrast and good plant density. It's the perfect turfgrass for an entire golf course, especially for those with lower maintenance budgets.

For more details on UGA-bred turfgrasses, see the website www.GeorgiaTurf.com.



Tif-varieties grow on many golf courses around the world (left) and on sports fields like Sanford Stadium in Athens, Ga. (top).

UGA TURF

Plant Disease Clinics identify diseased turf and recommend solutions

Diseased turf in a home lawn makes the homeowner want to call their county Extension agent for advice. To a golf course superintendent, diseased turfgrass means extra expense for fungicide applications. And diseased grass can quickly cut a sod producer's profits from delaying harvest or lost inventory.

Quick identification of the disease and swift treatment are key to handling infected turfgrass,

and factors leading to disease. Only after proper identification and understanding of the conditions favorable for disease infection, are control options recommended.

Of the over 500 turfgrass samples annually submitted to the UGA Plant Disease Clinic, approximately 60 percent come from commercial clients, like golf courses, sod farms, sports fields and lawn care operators. The remaining



Spring dead spot. (above left) UGA Extension plant pathologist Alfredo Martinez in the Turfgrass Pathology Laboratory on the Griffin campus. (center) Large patch (right).

whether it's growing where you live, play or work.

The UGA College of Agricultural and Environmental Sciences Department of Plant Pathology operates diagnostic clinics, which were established in 1984. Samples are commonly brought in to county Extension offices. When necessary, the UGA Plant Disease Clinics help county Extension agents analyze plant material and soil for bacterial, fungal, viral and nematode pathogens, and suggest appropriate controls.

In some cases, scientists can identify the disease from an emailed photograph in 12 to 24 hours. When the diagnosis is not as obvious, further study may be necessary. The specialist might have to isolate the pathogen from the turfgrass plant, give it time to grow under controlled conditions and then examined it under a microscope for proper identification. When necessary, the specialist may visit the site to see the affected area

40 percent are sent through the county delivery system on behalf of individual homeowners. The most common turfgrass diseases identified in cool-season grasses are dollar spot, pythium root and crown rot, anthracnose and brown patch. The most common warm-season turfgrass diseases identified through samples are large patch, take-all root rot (or root decline) and leaf spot.

"It's hard to put a dollar figure on this service. When you are dealing with someone's livelihood, how do you determine the effect of something that didn't occur because proper measures of control were implemented in a timely basis," said UGA Extension plant pathologist Alfredo Martinez. "It would be similar to trying to put a dollar figure on the fact that a person doesn't have cancer because it was prevented, diagnosed or treated in time."

From weed to wanted: salt-tolerant turfgrass a winner

Once viewed as a weed, seashore paspalum (pronounced pass-pal-um) continues to grow in popularity and is no longer “a plant out of place.” A warm-season perennial grass, seashore paspalum is well adapted to the moist and salt-affected areas commonly found in coastal regions. It tolerates sandy and infertile soils; high concentrations of salt; and occasional inundation by seawater and waterlogged conditions. It has many characteristics that make it highly desirable as a turfgrass.

The grass is purported to have come to North America via slave ships. Interest in the species grew in the Southeast and Hawaii in the 1950s and in California, Texas and Florida in the 1970s. It took off as a turfgrass species when the University of Georgia developed the first seashore paspalum breeding program in 1993 in Griffin, Ga., with core funding from the U.S. Golf Association.

The trend of building golf courses on coastal venues created the need for a high-quality turfgrass that could tolerate stresses associated with salt-affected sites and irrigation with brackish water. UGA breeders assembled a collection of ecotypes from around the world and began an intensive program to assess the traits and genetic potential of seashore paspalum as a turfgrass.

Now having released five cultivars (Sea Isle I, Sea Isle 2000, Sea Isle Supreme, Sea Spray and Sea Star), the UGA seashore paspalum breeding program, led by UGA agronomist Paul Raymer, is recognized as the major contributor to seashore paspalum's success as a turfgrass species. UGA-patented cultivars have been well accepted by the turf industry both domestically and internationally, and currently dominate the world market share.

Award-winning China golf course uses UGA-bred turf

Jian Lake Blue Bay Golf Club, located along the southeastern coastline of China's Hainan Island, was named by Golf Digest as the No. 1 New Golf Course in China for 2013. The course was designed by Mark Hollinger, (BLA – School of Environmental Design, '76), a golf architect with JMP Golf Design Group. He chose to use only UGA turfgrass for the course. Sea Isle 2000 Paspalum covers the course's greens, tees, fairways and roughs.

Seashore paspalum is tolerant of many environmental conditions, soils and water qualities. It is shown below growing on the award-winning Jian Lake Blue Bay Golf Club in China.

Photo by Thomas Breazeale.



UGA TURF

Turf information at your fingertips

Four mobile applications designed by University of Georgia Extension specialists put turfgrass pest management information literally at your fingertips.

The most popular UGA turfgrass app is **Turf Management Lite**. This free app was created with students, homeowners and professionals in mind. It includes photos of turfgrass varieties, pests, weeds and diseases.

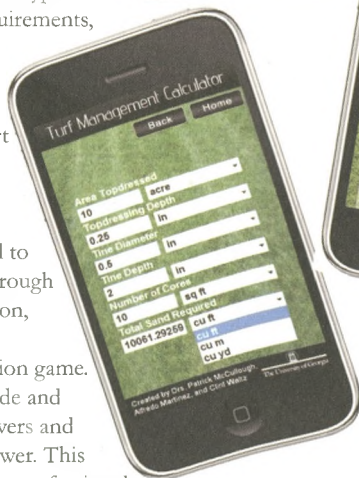
There are three versions of this app: **Turf Management Lite**, **Turf Management Subscription** and **Turfgrass Management — Spanish**. The lite and Spanish versions are free. The subscription version costs \$20 per year and includes everything from the lite version, plus information on pest control applications and a pesticide database. The Spanish version is popular in the turfgrass industry and has been downloaded in more than 40 countries.

The **Turfgrass Management Calculator** app is a comprehensive program that covers all types of applications, pesticide rates, fertilizer requirements, topdressing sand requirements, and calibration of sprayers and spreaders. Users enter known values of equations and the app does the math. It can convert units from standard to metric, includes more than 16,000 pre-programmed calculations and costs just \$5.

The **Turfgrass Weeds** app is designed to help users learn turfgrasses and weeds through a series of flash cards. It's a free application, and so is the newest app — **Turfgrass Management Quiz**, a trivia style education game. The quiz app has two modes — quiz mode and study mode. Quiz mode scores your answers and study mode helps you get the correct answer. This app is perfect for students or for turfgrass professionals who want to brush up on their knowledge.

The turf apps can be downloaded at www.GeorgiaTurf.com or through iTunes.

UGA turfgrass publications are still available online for computer users and in print through local county Extension offices.



Mobile soil testing aids in turf management

Mobile soil sensing technology makes sports fields easier on the environment and easier on players' bodies.

Gerald Henry, the University of Georgia Athletic Association's endowed professor of environmental turfgrass science, is using a new, mobile soil-sensing unit — created by Toro — to help create turf management maps of golf courses and sports fields. The maps will help field managers apply irrigation and fertilizers more precisely.

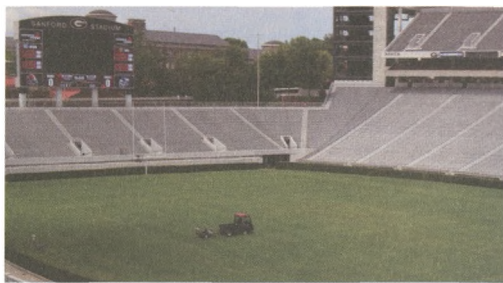
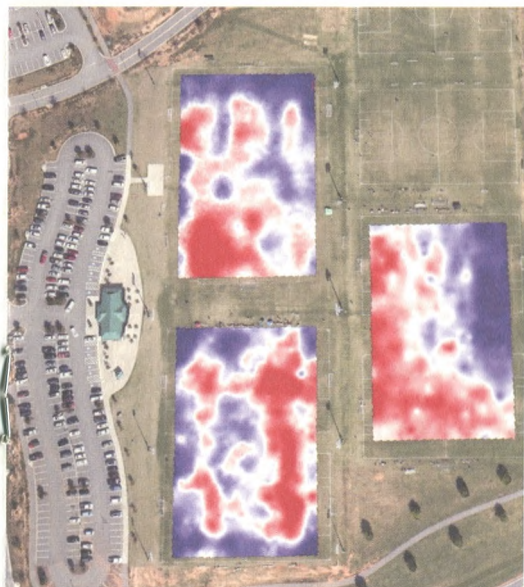
This device, one of only four in the world, is capable of collecting data on soil compaction, soil moisture, soil salinity, elevation and turf vigor, simultaneously and geo-referenced. Maps generated from this work become an integral component of precision turfgrass management,

allowing for the application of turfgrass inputs only where needed, when needed and in the amounts needed.

"This technology has predominantly been used on golf courses, but we've recently started using it on athletic fields," Henry said.

He has mapped all of the athletic fields on UGA's main campus in Athens. These maps help save about 2 billion gallons of water a year, following significant changes to the irrigation system at Sanford Stadium — home of the UGA Bulldogs football team.

In the future, Henry hopes to collaborate with sports medicine researchers to use his maps to optimize playability and safety on athletic fields on the community, collegiate and professional levels.



Soil compaction maps of three community sports fields (far left). Mapping Sanford Stadium, home of the UGA Bulldogs football team (upper right). Multi-sensor technology in tow is used for precision turfgrass management (lower right).

UGA**TURF**

Group effort results in better turfgrasses across the U.S.

Benefitting from a federally funded grant, the Special Crop Research Initiative, UGA researchers are collaborating with scientists from four other states to develop grasses that are more drought and salt tolerant and require fewer inputs.

UGA turfgrass scientists are evaluating turfgrass varieties from across the nation and narrowing them down to those best for Georgia and the Southeast. The other scientists are doing the same for their regions.

"We have the ability now to test all these grasses that look pretty good in our location, within a year or two, all over the South," said Brian Schwartz, turfgrass breeder on the UGA campus in Tifton, Ga. "So we can move quickly from the 80 that are performing well in Tifton to the five that are consistently good across the South. We can then throw out the other 75."

The team is focusing on drought tolerance, among other traits, and some promising lines have already been identified.

The project also allows the material to be quickly turned over to Extension specialists. As a UGA Extension specialist in turfgrass, Clint Waltz's familiarity with current varieties on the market makes his input invaluable.

The project has created a powerful breeding effort. Paul Raymer, UGA turfgrass breeder, said, "We have banded together to evaluate new breeding lines across the region."

A process that may have taken 15 years in the past, is being done in just four to five years. The scientists are substituting manpower for time, with a goal of developing turfgrasses that will survive on fewer resources.

The project is funded through 2015.



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University of Georgia turfgrass research trials on bermudagrass.

Organic turfgrass research meets demand

Environmentally conscious consumers often buy organically grown food and grow their own vegetables. They like knowing their food was grown without the use of synthetic pesticides or fertilizers. This niche population now wants to maintain their landscapes, and lawns, organically.

UGA turfgrass specialists are in the early stages of searching for ways to meet this segment of the population's needs. Sports field operators and school system landscape personnel are also searching for ways to reduce the use of pesticides and fertilizers on their playing fields, following parents' concerns over their children's exposure to chemicals.

Research trials at UGA are being designed to evaluate the use of nonsynthetic pesticides and

fertilizers on warm-season turfgrasses grown in Georgia. The goal is to reduce, and eliminate when possible, the use of these inputs.

Improving the health of the soil in which the turfgrass grows is a major focus area. By improving the soil's health, grass roots grow deeper. Deep roots can also tap into deeper water resources in times of drought.

UGA researchers are also looking at the use of composts as a top dressing and compost teas for growth and pest management. Some composts have shown limited potential for reducing pathogens like the ones that cause dollar spot disease.

The next phase of the project will be to search for selective organic weed management options.



Reducing inputs, fertilizer, pesticides or water, starts with a good root zone. Incorporating compost (top left) into the soil prior to planting can impact water use and pest management. Various organic fertilizers (top right) may be options for reducing the use of synthetic fertilizers. Reduced risk and sustainability are goals of future management practices (left).

UGA**TURF**

Water conservation an important issue in turf management

When water use became restricted due to severe drought in Georgia, UGA researchers stepped up to help Georgia's green industry learn how to best manage the precious resource its livelihood depends on.

Led by Extension turfgrass specialist Clint Waltz, UGA began a concerted effort to educate Georgia golf course superintendents. A comprehensive water conservation educational program was developed, which included workshops, written material and an online course.

As a result, the Georgia Golf Course Superintendents Association was prepared to write and implement a water conservation plan that was recognized by the Georgia Department of Natural Resources. As statewide water conservation initiatives evolved, UGA resources were incorporated into the Georgia Water

Conservation Implementation Plan. This plan allows the golf course industry to better control and manage water resources, conserving millions of gallons of water based on scientific and agronomic principles.

Next, a team of UGA researchers developed and published "Best Management Practices for Landscape Water Conservation." This peer-reviewed publication was shared with regulatory agents, water purveyors, landscape professionals and county Extension agents. Georgia's green industry used this publication as the basis for legislation that became the 2010 Georgia Water Stewardship Act. "The act simply states that plants need water to survive, and documents how to irrigate and be a water conserver and not a waster," Waltz said.



Golf course irrigation.

Field days, conferences extend research to the public

Thousands of visitors flock to UGA's campuses in Tifton and Griffin to learn about UGA turfgrass research through conferences and field days that allow participants to see, touch and even walk on UGA-bred turfgrasses.

Every year, UGA hosts the **Southeastern Turfgrass Conference** in Tifton, where turf scientists and breeders from UGA and other universities gather to share the latest in turfgrass science with the public. The annual conference highlights UGA turfgrass research and provides professionals with the knowledge they need to manage grasses in "the real world."

Biennially, UGA hosts close to 1,000 visitors at the **Turfgrass Research Field Day** in Griffin. Participants come from across the nation to hear UGA College of Agricultural and Environmental Sciences' researchers and Extension specialists present the latest information on how to care for lawns, sports fields and golf courses. Field day topics typically range from how to control turf insects, like mole crickets and white grubs, to the best methods for controlling turf weeds and diseases, like crabgrass and dollar spot.

To effectively communicate with the Hispanic workforce, Spanish translations are made available during the field days. In addition to the knowledge they gain from the day, professionals earn valuable continuing education credits and network with their peers.

Conferences and field days are organized by the UGA College of Agricultural and Environmental Sciences and UGA Extension with the help of sponsors like the Georgia Golf Course Superintendents Association, the Georgia Urban Ag Council and the UGA Center for Urban Agriculture.



Participants to the UGA field days on the Griffin campus get to see, feel, walk on and learn about new turfgrass cultivars and hear researchers discuss their latest projects.

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