2018 TURFGRASS & LANDSCAPE FIELD DAY

RESEARCH & INNOVATION FOR SUSTAINABLE TURFGRASS PRODUCTION & MANAGEMENT

dallas.tamu.edu/research/turf
aggieturf.tamu.edu
BEST PRACTICES FOR HERBICIDE RESISTANCE MANAGEMENT IN TURFGRASS

Herbicide-resistant weeds are emerging as a serious issue in turf, leading to economic and environmental consequences. The herbicide options available for effective weed control are limited and it is imperative that we protect the longevity of existing herbicides. Implementation of best management practices that include both chemical and non-chemical tactics will be essential.

More information on herbicide resistance management in turfgrass systems and the educational materials developed by the Weed Science Society of America on this topic can be found in the following links.

http://wssa.net/wssa/weed/resistance/
http://wssa.net/wssa/weed/resistance/turf-crops/

Differences in control levels of different annual bluegrass populations collected from golf courses in Texas

Foramsulfuron (Revolver®)

TC 1 2 3 4 NT

Trifluralin (Monument®)

TC 1 2 3 4 NT

Simazine (Princep®)

TC 1 2 3 4 NT

TC-treated check; NT-non treated check; 1 to 4 indicate different test populations
Lab testing, greenhouse and field studies are currently underway at Texas A&M University to begin to explore the agronomic potential of spent coffee grounds for use as fertilizer, root zone amendment, and as a pre-emergence herbicide in turf systems. Preliminary chemical analyses indicate many favorable properties of spent coffee grounds, including a ~2.4% N content, ~23:1 C:N ratio, slightly acidic pH of 5.6, and presence of many essential macro and micronutrients including S, Mg, Zn, Fe, and Cu. The highly porous nature of coffee beans will also presumably aid in soil water retention. Field studies were initiated in September 2017 on Celebration bermudagrass turf plots. Effects on turf and soil health are being monitored through evaluations of turf quality, percent green cover, weed and disease pressure, soil moisture, and chemical/microbial analysis of soils to determine changes over time. Greenhouse studies are currently underway to evaluate use as a pre-emergence herbicide and to determine effects on sand root zone physical properties.
SPRAYER CALIBRATION USING THE 1/128TH METHOD

Sprayer calibration is important before applying any pesticide to achieve the most effective control of target pests; prevent crop injury; ensure general safety of public; and result in chemical cost savings. The 1/128th method for sprayer calibration is a simplified way to calibrate any boom sprayer.

These easy to follow steps will demonstrates the 1/128th method:

Step 1
Determine your nozzle pressure and travel speed you intend to use. These must remain constant.

Step 2
Using table 1, find your nozzle spacing (column 1) to determine your travel distance (column 2).

Step 3
Using a stopwatch, record how long it takes to travel the distance determined in step 2.

Step 4
Collect spray from one nozzle for the time taken to travel in Step 3. The number of ounces collected = gallons per acre because one gallon = 128 ounces and the calibration area to be sprayed is equal to 1/128th of an acre.

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<tr>
<th>W (in)</th>
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<th>Seconds to travel (D) feet at a speed of:</th>
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<td>40</td>
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Disclaimer: The websites and companies associated with the links are provided and discussed solely for information purposes and are not to be construed, under any circumstance, as a recommendation for their services or products.
PERSONAL PROTECTIVE EQUIPMENT: WHAT IS REQUIRED AND WHAT YOU SHOULD USE

Pesticide handlers must wear personal protective equipment (PPE) required by the pesticide label, and it must be provided by their employer. In addition, agricultural employers must provide and maintain PPE for use by early entry workers, this includes those who work on sod farms or maintain other plants for use on public property. This session will cover selections by participants to review a common herbicide label and determine what PPE is needed. We will also cover who is a handler, early-entry worker, and others; what to do when you are exposed to a chemical spill and heat related illnesses.
WHAT MAKES A GOOD SAMPLE FOR DISEASE DIAGNOSTICS?

Sheila McBride (M.Sc.), Program Extension Specialist and lead diagnostician from the Texas Plant Disease Diagnostic Lab (TPDDL) will be presenting on how to collect and submit appropriate samples to the lab. The presentation will include the tools needed to obtain a proper turf sample for an accurate diagnosis for all turf diseases and plant parasitic nematodes. Submission forms (D-1178 and D-827) will be explained in detail so that submitters know how to provide the information we require in order to make an accurate diagnosis. TPDDL receives samples from golf course superintendents, sports turf and landscape professionals and provides support by sending submitters recommendations for disease management.

Plant Disease Diagnosis Form link: https://plantclinic.tamu.edu/files/2010/10/Plant-Disease-Diagnosis-Form-D-1178.pdf

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**Texas Plant Disease Diagnostic Laboratory**

1500 Research Parkway, Suite A130
Texas A&M University Research Park
College Station, Texas 77845
Phone: 979.845.8032        Fax: 979.845.6499
Email: plantclinic@tamu.edu
http://plantclinic.tamu.edu

**Plant Disease Diagnosis Form**

Submitter contact information (Please print.)

Name: ____________________________________________
Company name (if commercial): _______________________________________
Address: ____________________________________________
City: ____________________________________________ State/Zip: ____________
County: ____________________________________________
Phone: ____________________________________________
Email: ____________________________________________
Submitter is:  AgriLife personnel    Homeowner    Consultant
            Golf course    Commercial    Other

Grower contact/sample location information (Complete if different from submitter.)

Name: ____________________________________________
Company name (if commercial): _______________________________________
Address: ____________________________________________
City: ____________________________________________ State/Zip: ____________
County: ____________________________________________
Phone: ____________________________________________
Email: ____________________________________________
Grower is:  AgriLife personnel    Homeowner    Consultant
            Golf course    Commercial    Other

Send result via:  Email    Standard mail    Send results to:  Submitter    Grower    Third party

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**As of January 01, 2017:** Routine diagnostic charge is $35 per specimen. This includes triage, microscopy, culturing and other basic tests as necessary, diagnostic report, and management suggestions. All out-of-state samples will be assessed a $20 surcharge/sample.

Refer to the back of this form to view sampling and mailing instructions and/or make additional comments regarding the specimen.
**BREEDING EFFORTS TO IMPROVE LARGE PATCH TOLERANCE IN ZOYSIAGRASS**

Large patch disease is caused by a fungal pathogen, Rhizoctonia solani (AG 2-2 LP), and continues to be the #1 pest problem on zoysiagrass in the transition zone and the southern U.S. The best fungicides for suppressing this disease can cost up to ~$350/acre. In an effort to reduce the use of fungicides, we have been working on developing large patch disease tolerant cultivars of zoysiagrass. Texas A&M turfgrass breeding team developed approximately 2,800 new hybrids in 2011/2012 by crossing selected parental lines exhibiting large patch tolerance, cold hardiness and turfgrass quality characteristics. These hybrids were tested at three locations (Dallas, TX; Manhattan, KS and West Lafayette, IN) from 2012 to 2014 (2 yr. of winter recovery and turfgrass quality data). The 60 best underwent more extensive testing at 10 locations across the transition zone for another 3 years. In 2018 the 10 best of the 60 hybrids were chosen for the final stage of testing at the three home locations for cold, shade, large patch tolerance and hunting bill bug resistance.

### 2015 Zoysia Coop Trial – Dallas Plot Plan, Planted July 30, 2015

Gray = Checks; Green = Top multi-location lines; Orange = additional TAM selections

<table>
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<tr>
<th>Rep 1</th>
<th>10</th>
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<th>8</th>
<th>7</th>
<th>6</th>
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Shade is an inevitable abiotic stress for turfgrasses in urban environments. To evaluate the response of different turfgrass varieties under varying levels of shade, a study is currently underway at Texas A&M AgriLife Research-Dallas. Three shade levels used in this study are 63% (moderate), 80% (heavy) shade and full sun. Plots were established from one 4" plug and are replicated three times within each shade level. Plots remain shaded through winter to simulate evergreen tree coverage. Data is collected to capture turfgrass response to shade including leaf elongation rates, establishment rates, and loss of color, quality, and plot density.

A St. Augustinegrass trial began in July 2017 using 26 advanced lines selected for drought tolerance and 10 commercial cultivars. The plots have been shaded for 15 months. In comparison to full sunlight, shaded plots were slower to enter dormancy and to green-up in the spring of 2018. A combination of grey leaf spot and fire ant damage during the 2017 growing season as well as harsh winter conditions were contributing factors resulting in plot loss in all treatments. Approximately 45% of plots did not recover in both full sunlight and moderate shade, and 95% of plots were lost under heavy shade. Some St. Augustinegrass hybrids (TAES 6452-31, DALSA 1618, 1404, TXSA-26) are demonstrating good disease resistance, winter recovery, establishment rates, and overall quality compared to commercial cultivars.

A zoysiagrass trial began 5 months ago in May 2018 using 31 advanced lines and five commercial cultivars. In addition to drought performance, zoysiagrasses were selected based on speciation, cold tolerance, and resistance to large patch (Rhizoctonia spp.). Published articles have suggested that Z. matrella types such as Diamond and Zorro perform better under shade than Z. japonica types such as Meyer, but coarser textured species generally have greater cold and drought tolerances. Zoysiagrasses in this study include natural ecotypes as well as intra- and inter-specific hybrids. Coarse and intermediate-textured selections (DALZ 1311, 1601, 1714) are showing more rapid establishment under full sunlight and moderate shade compared to finer-textured selections. Although establishment is significantly lower under heavy shade, some zoysiagrasses including finer-textured selections are maintaining acceptable turfgrass quality. Finer textured selections performing well under moderate shade include DALZ 1308 and 1609.

Efforts to mitigate damage should include integrated pest management to modify cultural practices (mowing height, irrigation frequency/amount) and to properly identify diseases and insect pests to select the appropriate pesticides.
EVALUATION OF NEW ZOYSIAGRASS AND ST. AUGUSTINEGRASS VARIETIES FOR THE NATIONAL TURFGRASS EVALUATION PROGRAM

The National Turfgrass Evaluation Program (NTEP) provides results on national testing of all major turfgrass species. Information on warm- and cool-season turfgrass species performance at locations across the United States and Canada can be found at www.ntep.org.

### 2013 Zoysiagrass NTEP
Planted July 23, 2013

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### 2016 St. Augustine NTEP
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PERSISTENCE AND SURVIVAL OF TURFGRASS UNDER LONG-TERM DROUGHT AND NEW TURFGRASS VARIETIES FROM TEXAS A&M AGRILIFE RESEARCH

INNOVATION zoysiagrass

SPRING GREENUP APRIL 2015
MANHATTAN, KS

Innovation  Meyer  Empire  Zeon

THE SCIENCE
Developed by Texas A&M AgriLife Research scientists in Dallas, DALZ 1308 represents a scientific breakthrough in its standing as the first zoysiagrass hybrid intended specifically for putting greens. It was bred for superior performance by crossing two different zoysiagrass species, Z. minima and Z. matrella.

DALZ 1308 was tested across the southern U.S. as part of the 2013 Warm-Season Grass Putting Greens National Turfgrass Evaluation Program.

Go to www.ntep.org/ws.htm for information on the performance of DALZ 1308 by region, and visit dallas.tamu.edu to read more about the AgriLife Research turfgrass breeding program at Dallas.

DALZ 1308 TRAITS
• High performance putting surface
• Unmatched winter color retention
• Very fine texture
• Ultra-dwarf variety
• Fewer inputs needed
• High shoot density

More information about where to find DALZ 1308 at http://www.bladerunnerfarms.com/

DALZ 1308 (next-generation)

NTEP TESTING LOCATIONS

KEY FEATURES
• Cold-hardiness equivalent to Meyer
• Finer leaf texture than Meyer
• Better density than Meyer
• Superior turfgrass quality

APPLICATION
Golf course fairways and tees, and home lawns across the U.S. transition zone.

More information about where to find Innovation Zoysiagrass at https://sodsolutions.com

DALZ 1308

INNOVATION zoysiagrass

Z. minima
Z. matrella

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REVIEWING THE ROOT CAUSES OF INCREASING RUNOFF AND POOR TURFGRASS RESPONSES TO FERTILIZATION, IRRIGATION AND RECOVERY

The degradation of soil tilth, the term used to define the physical condition of the soil as it relates to plant growth, is responsible for many of the negative environmental effects of turfgrass management. Understanding how to determine if a soil has degraded soil tilth, and more importantly, how to prevent and remediate soil tilth issues, is vital toward reducing runoff of rain water, irrigation water, fertilizers and pesticides applied to a turfgrass system.

This talk will focus on management actions that may degrade or improve soil tilth. Key concepts/concerns that impacting root growth include the impacts of soil fertility and pH, mowing height, irrigation watering and soil compaction. Each of these factors will be discussed with suggestions on minimizing the impact of management/turf use on turf growth, water infiltration and runoff.

Information on soil, plant tissue and irrigation water testing can be downloaded from the Texas A&M AgriLife Extension Soil, Water and Forage Testing Laboratory

http://soiltesting.tamu.edu
THE WATER EFFICIENT LANDSCAPE

Healthy landscapes bring innumerable advantages to residential and commercial properties alike. They add aesthetic value while providing erosion protection and temperature control. They serve as functional outdoor space for relaxing and entertaining. But in Texas, over-watering, over-fertilizing and over-applying pesticides often lead to struggling landscapes and pollution of precious water resources.

The EPA estimates that in dry climates including many across Texas, a property's outdoor water use can exceed the amount of water used for all other purposes therein. In some households during summer, for example, as much as 60% of a total water budget goes toward landscape irrigation alone.

By incorporating the best management practices outlined in this discussion, and by selecting the right plant material for your specific needs, you can drastically reduce water use and pollution from landscape chemicals.

More information at https://wateruniversity.tamu.edu/
MANAGING IRRIGATION THROUGH TECHNOLOGY

Being a good irrigation manager comes down to knowing when and how much to water a landscape. Advances in irrigation technology have added to the irrigators’ toolbox on addressing these two management decisions. By incorporating smart controllers, soil moisture sensors and efficient sprinkler technologies, irrigation managers can conserve water, promote a healthy landscape and reduce runoff.

The Irrigation Technology Program has been evaluating smart irrigation controllers since 2008 and based on those results have learned no two controllers are alike in their setup or operation. Knowing what sensors and settings help controllers create efficient irrigation schedules and maximize their water conservation potential is critical for every landscape manager interested in this technology.

Keys to incorporating smart technology:

Know your landscape. Factors such as plant type, root zone depth, soil type and microclimates will affect equipment selection and operation.

An irrigation system is only as good as the person behind the design, installation and maintenance of the system. All three must be done properly to produce quality landscapes and conserve water.

Understand Technology is a tool. All irrigation products have their limitations but knowing how to properly incorporate the right technology will make managing and operating the irrigation system more efficient.

For additional information on equipment selection and other irrigation resources, visit the Irrigation Technology Program website at http://ITC.tamu.edu

For help scheduling irrigation, Sign up for weekly local watering recommendations at http://WaterMyYard.org
INTEGRATED WEED MANAGEMENT

Integrated Weed Management (IWM) takes a five-pronged approach to comprehensive weed management that encompasses Preventative, Biological, Mechanical, Cultural, and Chemical control methods (Anderson, 1996). This session will explore each control method, and will finish with a brief overview of common Texas indicator weeds for solving underlying problems in turfgrass systems.

**Preventative**
Measures taken to prevent the introduction or spread of weeds to non-infested areas. Includes utilizing weed-free seed, sod, and soil amendments as well as the cleaning of equipment being used across multiple areas.

**Biological**
The utilization of “natural enemies” for the control of a particular weed species. This can include the use of certain insects, plant pathogens, and livestock including backyard chickens. Exercise caution when introducing new biological agents into an area.

**Mechanical**
Involves the use of non-chemical means to physically remove, suppress, or control weed growth. In many cases, this can involve the use of equipment such as hoes, trowels, or other lawn weeding devices. May also involve hand-pulling, smothering, temperature control, or regular mowing.

**Cultural**
Implementing best management practices (BMPs) to optimize turfgrass growth and naturally reduce weed competition. Encompasses all aspects of turfgrass management including appropriate irrigation, fertilization, mowing, cultivation and pest management.

**Chemical**
The use of phytotoxic chemicals or herbicides to chemically suppress and control weeds. Often involves the use of both pre- and post-emergence herbicides. In the case of IWM, this method is used in conjunction with the other methods listed above to maximize efficacy and reduce overall need for chemical applications.

**References**
TURFGRASS DISEASE DIAGNOSIS AND MANAGEMENT

Turf managers face continuous challenges from unfavorable environmental conditions, diseases, drought and flood in Texas. In addition, tight budgets and increasing costs of necessary pesticides makes disease management challenging. This presentation will review common disease issues of home lawns, golf courses and sports turf, and help turfgrass professionals manage important diseases in warm-season turfgrasses. Accurate diagnosis, knowledge about environmental conditions promoting or discouraging diseases, and choosing proper management practices will be covered in this presentation. The recent research progress relevant to disease management will be highlighted. Timely monitoring and diagnostic methods developed in my lab will be introduced. Proper selection and application of fungicides will be overviewed. This will help turf managers to prepare effective and efficient disease management practices to meet the desired quality of turf.
WEED ID AND HERBICIDE SELECTION

1. Weed management starts with positive weed identification
   What plant/s are you trying to control?
   Broadleaf, grass, sedge?
   Annual, biennial, or perennial?

2. Which herbicide will control my weeds
   Pre-emergent or Post-emergent
   Contact or Systemic
   Does it have residual activity

3. Specific recommendations for problem weeds
   Dallisgrass, Sandbur, Crabgrass, Annual Bluegrass, Sedges

4. Why did my weed control fail?
   Misidentification of weeds
   Equipment issues – damaged tips, uneven application, poor mixing/agitation, poor coverage
   Rates & Weed Sizes – wrong rate used, low GPA, incorrect calibration, weeds too big/off-label
   Lack of incorporation – rainfall, irrigation or watering did not move herbicide into soil
   Environment – rainfall washed herbicide off, temp not ideal, low humidity, stressed plants
   Weeds being weeds – regrowth or new flush after application, resistance development

5. Resources
   https://aggieturf.tamu.edu/turfgrass-weeds/ - Weed ID
   https://aggieturf.tamu.edu/publications/ - Weed, Insect, & Disease Control Guide
   http://www.cdms.net/ - Searchable Herbicide Label Database
THE CURIOUS LIFE OF THE PEST ANT... AND HOW TO END IT

Historically speaking, red imported fire ants [Solenopsis invicta (Fig. 1)] are the most economically and ecologically important invasive ant species to have established themselves in the United States. Since their introduction in the 1930's they have expanded their US range to occupy urban and rangeland habitat from western Texas across all of the southeastern US and eastern states up to Virginia, and non-contiguous populations are established in many western states. Managing populations of these ants can be a challenge, but decades of research have resulted in the availability of many reliable products and approaches. The most efficient management tactic involves the use of insecticidal granular ant baits, and the most effective use of baits involves the Texas Two-Step approach. This strategy involves broadcast applications of granular ant baits in the fall of the year, followed by more targeted applications of bait or contact insecticides for persistent colonies during the spring of the following year. For more information about these ants and their management, please visit the link below.

Additionally, a newly invasive species of pest ant is making its way across Texas. Since 2002, tawny crazy ants (Fig. 2), Nylanderia fulva (formerly Rasberry crazy ants), have expanded their range to include 39 Texas counties. Their range expansion has been assisted by humans moving infested materials such as plants, building materials, mulch, yard debris, and hay bales. These ants rapidly invade new areas, and their population densities reach extraordinary levels. In urban habitats, tawny crazy ants become an extreme nuisance as they forage around, on, and inside structures. They also damage and destroy electrical components and equipment. These ants have been observed to decrease arthropod diversity in the systems they invade. They can become a serious pest of agricultural systems because they infest hay bales, impact commercial honeybee colonies, and influence increased population densities of honey-dew producing insects that feed on plants (including ornamental and agriculturally important plant species). These ants represent a Texas-sized challenge that will require the diligence of all Texans to solve.

For more information visit https://fireant.tamu.edu/
SURVEY

WHICH FIELD DO YOU WORK IN?
☐ Golf  ☐ Sports  ☐ Landscape  ☐ Other: ______________________

WHAT WAS YOUR PRIMARY REASON FOR ATTENDING FIELD DAY?
☐ CEU's  ☐ Exhibitor  ☐ Learning Experience  ☐ Other: ______________________

WHAT WAS THE MOST BENEFICIAL PART OF FIELD DAY?
☐ Interacting with speakers  ☐ Attending different talks  ☐ Meeting with exhibitors  ☐ Other: ______________________

WHAT IS YOUR PRIMARY AREA OF INTEREST?
☐ Turfgrass management  ☐ Irrigation installation/management  ☐ Landscape design/management  ☐ Other: ______________________

HOW WOULD YOU MAKE FIELD DAY BETTER IN THE FUTURE?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

WHAT ADDITIONAL TOPICS WOULD YOU LIKE COVERED AT FUTURE FIELD DAYS?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________