

Landscape Recovery Series: Part IV

Turfgrass Renovation and Establishment

April 18th, 2019

Dr. J. Bryan Unruh
Extension Turfgrass Specialist
University of Florida/IFAS

So you have a mess!
Now what do you do?

Overview

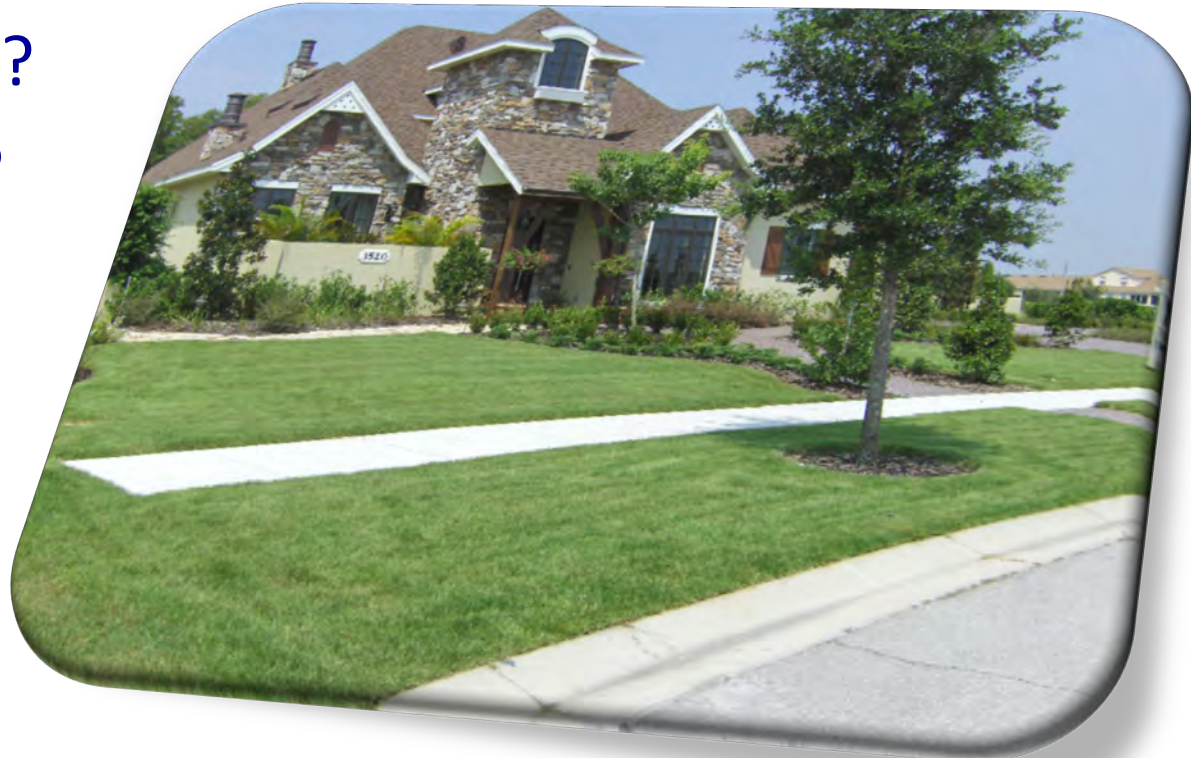
- Selecting the Right Turfgrass
 - The pros and cons of available options
- Establishing/Reestablishing Your Lawn
 - To sod or not to sod?
- Irrigation or irritation
 - PVC pipes are no match for fallen trees!
- Fertilizing Damaged Turf
 - Don't add insult to injury!

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Selecting the Right Turfgrass

- What type of lawn is desired or expected?
 - Better Homes and Garden Showcase?
 - Average lawn?
 - Parking area?



Bahiagrass



Bahiagrass



Bahiagrass Development



Funded by:

USGA



Bahiagrass

- Advantages
 - Excellent drought tolerance
 - Low fertility requirements
 - Low maintenance
 - Tolerant of sandy, infertile soils
 - Establishes from seed
- Disadvantages
 - Produces abundance of seedheads
 - Open growth habit encourages weed competition
 - Susceptible to mole crickets
 - Coarse stems are difficult to mow
 - Not wear tolerant

Bermudagrass



Bermudagrass

- Advantages

- Vigorous, light to dark green, dense turf.
- Well adapted to most soils and climatic regions in Florida.
- Excellent wear, drought, and salt tolerance.
- Establishes rapidly.

- Disadvantages

- Large number of cultural and pest problems
- Dormant bermudagrass must be overseeded to maintain year-round green color.
- Low shade tolerance.

Bermudagrass Cultivars

- **Tifway (419)** – fine textured; dark green color, and forms few seed heads.
 - Most widely used bermudagrass.
- **TifGrand** - Tolerance of 60% to 70% shade.
- **Celebration** – a selection of common bermudagrass from Australia.
- **TifTuf** – newest drought tolerant variety from the University of Georgia.
- **Seeded Varieties** – Many new varieties being tested and many on the market.
 - NuMex Sahara, Yuma, Princess 77.

Celebration Bermudagrass



TifGrand Bermudagrass

A wide-angle photograph of a lush green lawn, likely a golf course or a large residential yard. The grass is a vibrant green and appears to be TifGrand Bermudagrass. Long, soft shadows from trees in the background stretch across the lawn, indicating it's either early morning or late afternoon. The background is filled with a dense line of trees, including several tall, thin pines. A small portion of a house is visible on the far left. The overall scene is peaceful and well-maintained.

2003 9 3

TIFTUFTM

CERTIFIED BERMUDAGRASS

**SAVE WATER
SAVE MONEY**

supersod.com

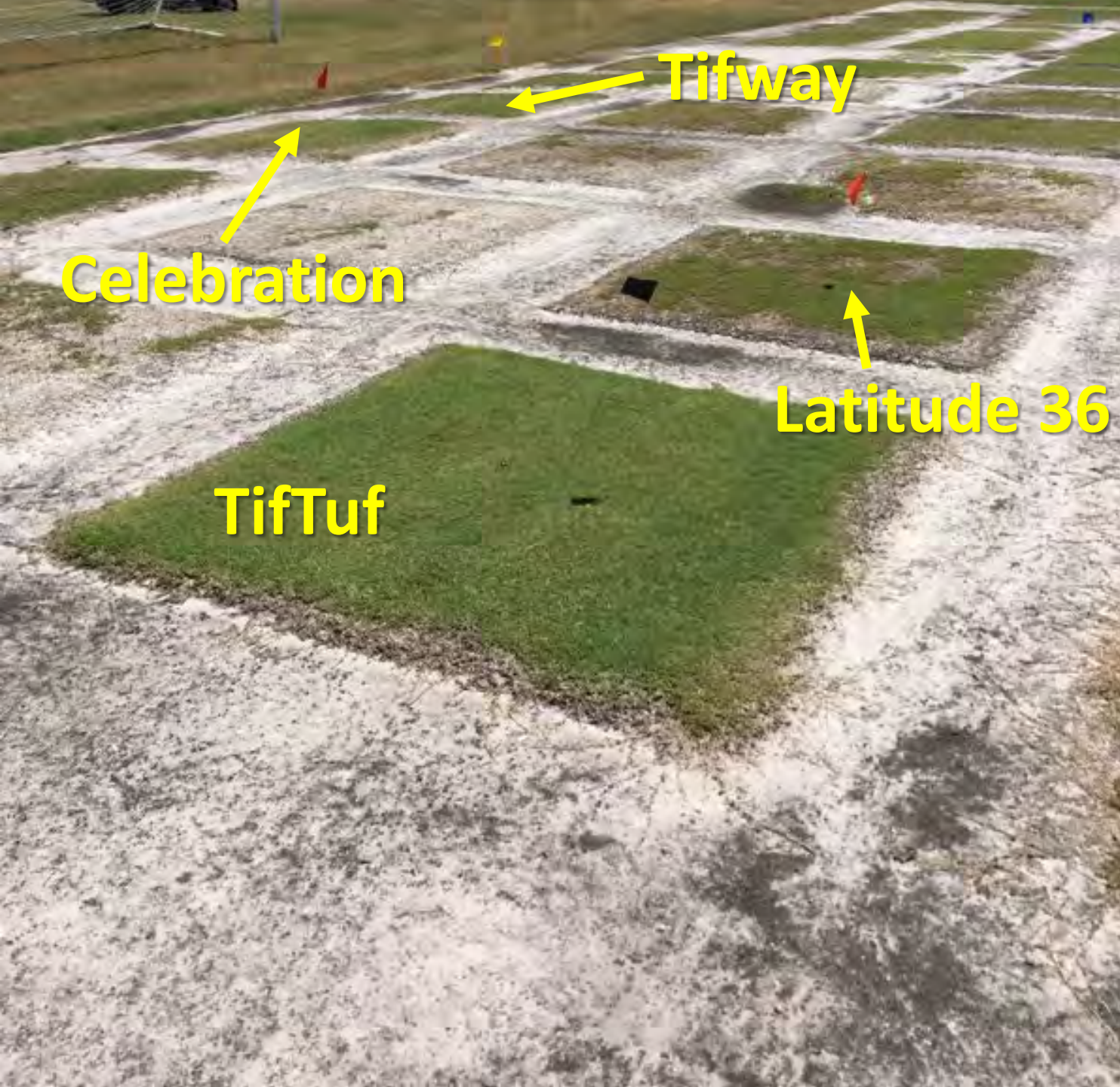


OFF



DT-1 (‘TifTuf’) “Selected” in 2001





Nematode Infested Site

2013 NTEP Bermudagrass Trial



Cool Season Grasses



- [Bentgrass - Fairway/Tee](#)
- [Bentgrass - Putting Green](#)
- [Fineleaf Fescue](#)
- [Ky. Bluegrass - High Input](#)
- [Ky. Bluegrass - Low Input](#)
- [Perennial Ryegrass](#)
- [Tall Fescue](#)
- [Cool-Season \(Low Input\)](#)
- [Cool-Season \(Drought\)](#)

Warm Season Grasses

- [Bermudagrass](#)
- [Buffalograss](#)

NTEP Bermudagrass Tests

2013 National Bermudagrass Test

[2013-17 Data - Final Report](#)

[2017 Data - Progress Report](#)

[2016 Data - Progress Report](#)

[2015 Data - Progress Report](#)

[2013-14 Data - Progress Report](#)

2007 National Bermudagrass Test

[2007-12 Data - Final Report](#)

[2012 Data - Progress Report](#)

[2011 Data - Progress Report](#)

[2010 Data - Progress Report](#)

[2009 Data - Progress Report](#)

[2008 Data - Progress Report](#)

[2007 Data - Progress Report](#)

2002 National Bermudagrass Test

[2003-06 Data - Final Report](#)

[2006 Data - Progress Report](#)

[2005 Data - Progress Report](#)

[2004 Data - Progress Report](#)

[2003 Data - Progress Report](#)

1997 National Bermudagrass Test

[1997-2001 Data - Final Report](#)

TABLE 1B. TURFGRASS QUALITY RATINGS OF BERMUDAGRASS (SEEDED) CULTIVARS
GROWN AT SEVENTEEN LOCATIONS IN THE U.S. 1/
2013-17 DATA

TURFGRASS QUALITY RATINGS 1-9; 9=IDEAL TURF 2/

NAME	AL1	AR1	AZ1	CA3	FL3	GA1	IN1	KS2	KY1	MD1	MO1	MS1	NC1	OK1	TN1	TX2	VA1	MEAN
RIVIERA	4.3	6.4	6.0	5.6	5.8	4.9	6.7	5.0	7.0	6.1	6.0	6.0	4.4	5.5	7.6	5.6	6.7	6.3
MONACO (JSC 2007-13-S)	4.1	6.7	5.5	5.6	5.6	5.0	6.1	5.1	7.1	6.3	6.0	6.1	4.5	5.5	7.5	5.8	6.9	6.3
MBG 002	4.1	6.1	6.6	5.5	5.7	5.0	6.1	5.0	7.1	4.7	5.4	6.0	4.6	5.6	7.5	5.8	5.9	6.2
JSC 2009-2-S	4.2	6.3	5.9	5.2	5.7	4.9	6.0	5.0	6.8	6.1	5.7	6.1	4.3	5.5	7.7	5.3	6.2	6.2
JSC 2009-6-S	3.8	5.7	6.0	5.3	5.7	4.5	6.3	5.1	6.9	5.6	6.0	6.2	4.4	5.6	7.4	5.4	6.5	6.2
JSC 2007-8-S	3.9	6.1	5.7	5.5	5.8	4.7	6.1	5.1	6.9	5.8	5.8	6.0	3.7	5.5	7.6	5.5	6.5	6.2
OKS 2011-1	3.9	6.0	5.6	5.5	5.6	4.8	5.9	4.9	6.8	5.3	5.0	6.1	3.9	5.3	7.5	5.0	5.8	6.0
PRINCESS 77	4.5	6.1	6.4	5.8	5.7	4.6	6.6	3.2	6.7	4.0	4.5	5.9	4.6	5.4	7.4	6.4	5.1	6.0
12-TSB-1	5.1	5.7	6.7	5.6	5.9	4.6	6.2	2.9	6.6	4.6	4.3	6.1	4.5	5.3	7.3	6.4	4.8	5.9
YUKON	2.8	4.6	5.3	5.3	5.7	4.3	6.7	4.9	6.6	4.1	5.3	5.3	4.1	5.2	7.5	6.0	6.1	5.8
BAR C291	3.4	5.8	5.5	5.1	6.0	4.8	5.5	4.7	6.5	4.1	4.8	5.6	4.0	5.3	7.3	5.1	5.7	5.8
OKS 2011-4	3.2	5.7	5.4	5.1	5.8	4.9	5.6	4.4	6.8	4.5	4.8	5.7	4.1	5.2	7.5	4.3	5.5	5.8
PST-R6CT	2.7	5.5	5.1	5.3	5.4	4.9	6.2	4.6	6.7	3.8	4.4	5.9	3.4	5.1	7.4	6.0	4.7	5.7
PST-R6P0	2.5	5.0	5.5	5.3	5.3	5.0	6.1	4.6	6.6	3.7	4.5	5.8	3.9	5.1	7.4	4.2	5.0	5.7
OKS 2009-3	3.2	6.0	5.2	5.1	5.2	4.8	5.5	4.2	6.1	4.6	4.5	5.8	3.8	5.1	7.3	4.6	5.3	5.6
NORTH SHORE SLT	2.8	5.7	5.6	5.0	5.4	4.6	5.5	4.4	5.6	3.6	4.2	5.4	3.3	5.0	7.5	5.0	4.7	5.6
PST-R6T9S	3.0	4.4	5.3	4.9	5.2	4.6	6.3	4.0	5.7	3.9	4.3	5.9	3.6	5.0	7.2	4.4	4.8	5.4
NUMEX-SAHARA	1.9	5.1	4.7	5.0	5.6	4.4	5.5	3.8	5.9	3.8	3.9	5.2	2.9	4.6	7.5	4.0	3.7	5.3
LSD VALUE	1.0	0.9	0.8	0.5	0.6	0.8	0.9	0.7	0.9	1.3	0.7	0.4	0.9	0.3	0.5	1.1	1.1	0.3
C.V. (%)	16.8	10.5	9.1	5.4	6.3	12.1	8.2	9.1	8.9	17.8	9.5	4.1	14.3	3.7	4.0	13.3	12.1	8.1

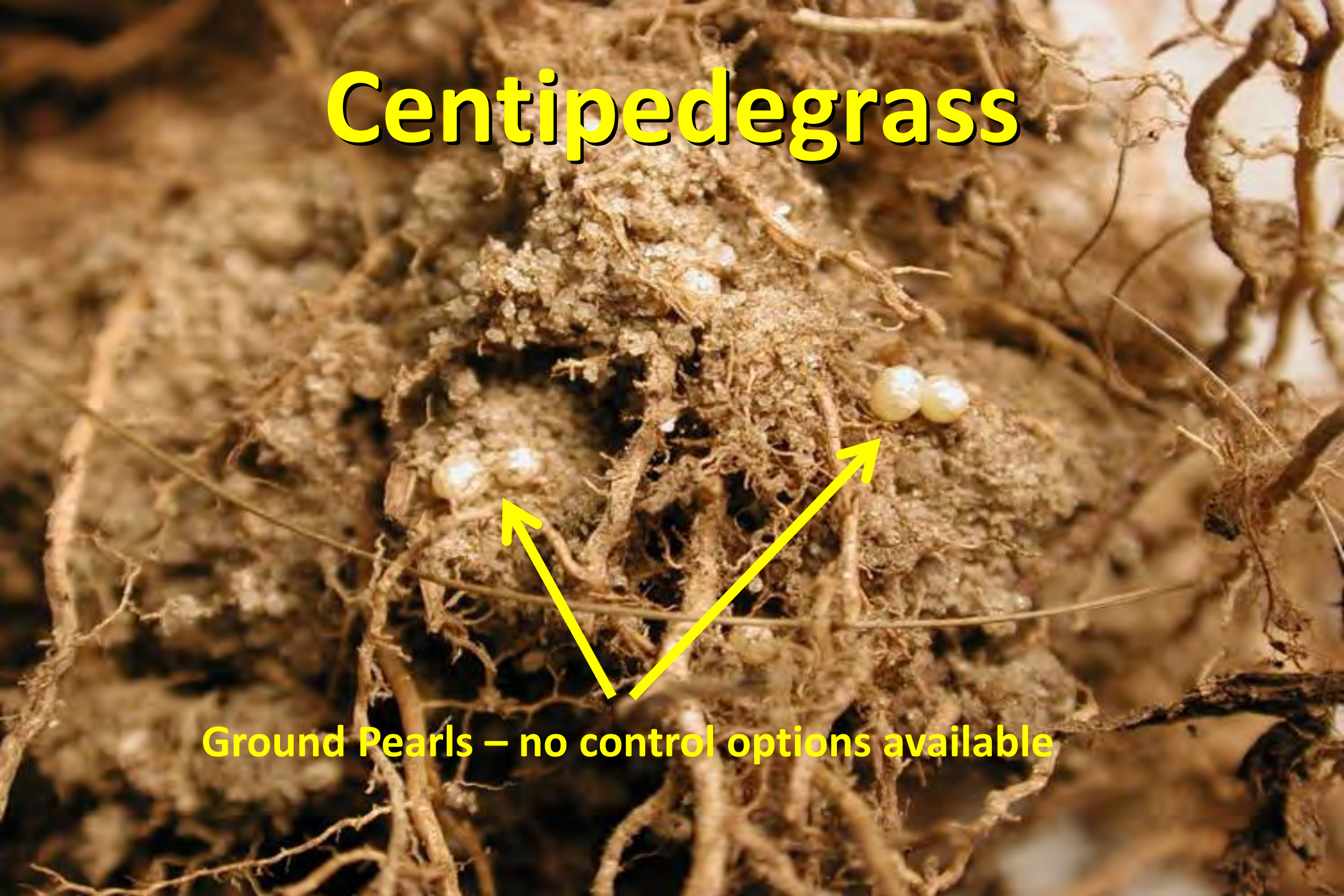
1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN.
STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

Centipede grass



Centipedegrass



Ground Pearls – no control options available

Centipedegrass Decline

APPROXIMATE
PROPERTY LINE



05/01/2009

The Mystery of the Yellowing Centipedegrass Home Lawn.....

Everything

Iron alone

Check

19. 6. 2003

Spittlebugs



Spittlebug Injury



Centipedegrass Cultivars

- Common (yellow or red stem)
 - Most commonly found
- TifBlair (Georgia release)
 - Cold tolerance claims



Seashore Paspalum

Seashore Paspalum





Seashore Paspalum

Seashore Paspalum

- UF currently doesn't recommend Seashore paspalum for average home lawns due to the management complexities.





St. Augustinegrass

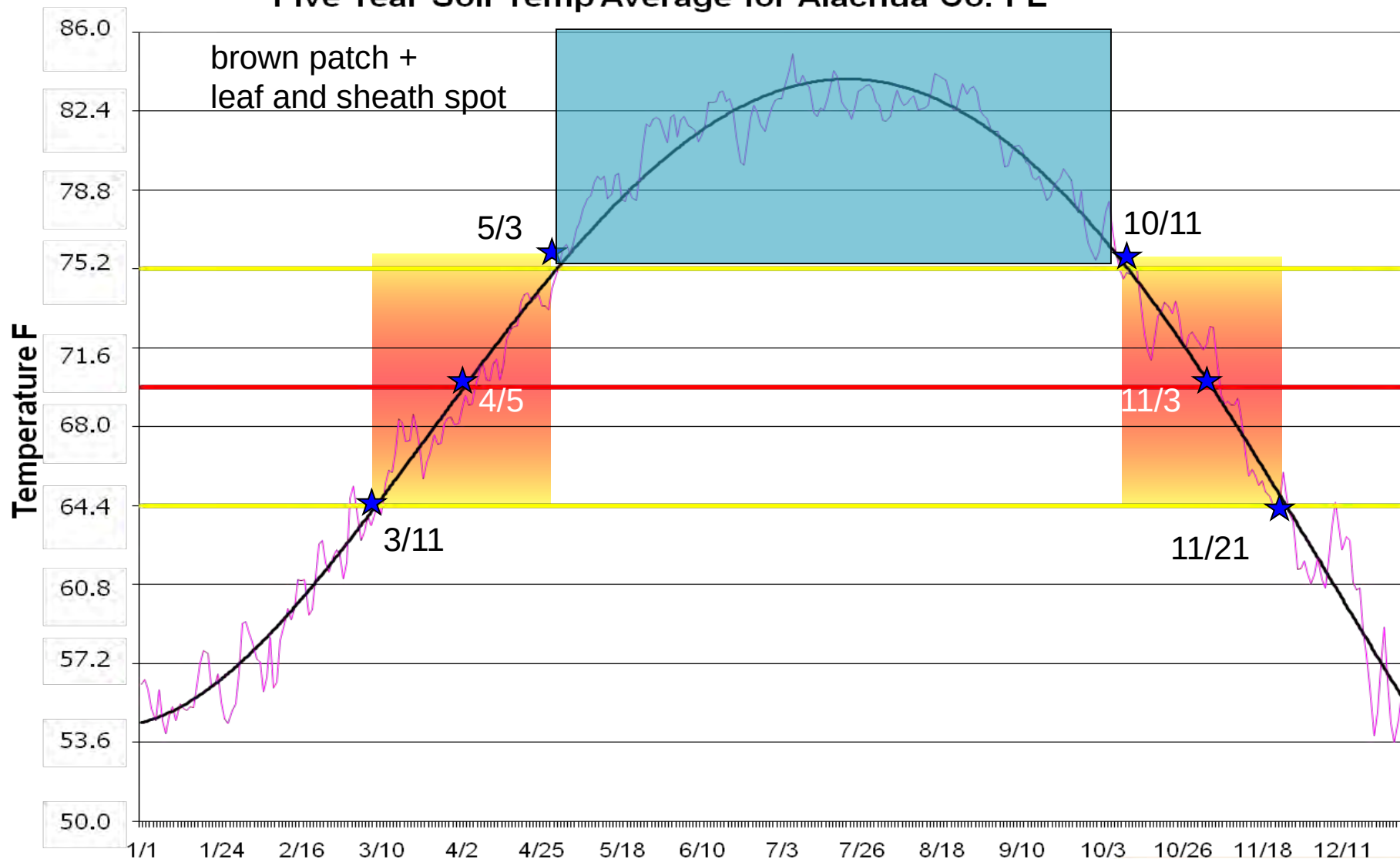
Gray Leaf Spot in St. Augustinegrass



A wide-angle photograph of a large, open grassy field. In the foreground, a concrete walkway with a white metal railing leads down towards the field. A person in a red shirt and dark pants is walking down the stairs. The field itself is mostly green but has a large, irregular patch of dry, yellowish-brown grass in the center. A single tree stands in the middle of the field. In the background, there is a parking lot filled with various cars, and behind that, a long, two-story red brick building with many windows. The sky is clear and blue.

Large Patch in St. Augustinegrass

Large Patch Activity Assessment Five Year Soil Temp Average for Alachua Co. FL





Take-all Root Rot in St. Augustinegrass

1 3 2001



Chinch Bugs

Piercing/Sucking Insects



Chinch Bugs



Floritam

Tropical Sod Webworm Damage



Tropical Sod Webworm Larvae



St. Augustinegrass Cultivars

- **Bitterblue** - fine textured, blue-green color
- **Floritam** - 1973 release. Coarser than Floratine. 75% sod in Florida. Resistant to SAD but no longer to chinch bugs in Florida.
- **Seville** - Dwarf with salt and shade tolerance, SAD resistance, BUT very susceptible to chinch bugs.
- **Raleigh** - Cold tolerant from NCSU. Turns yellow in hot summer, susceptible to chinch bugs and GLS.

St. Augustinegrass Cultivars

- **Palmetto** - cold tolerant.
- **Sapphire** - newest release from Sod Solutions, Inc.
- **Classic** - proprietary release from Woerner Turf.
 - Claims of cold tolerance.
- **Captiva** –release from the University of Florida.
- **CitraBlue** – latest release from the University of Florida.
- **ProVista** – new release from The Scotts Company

St. Augustinegrass Cultivars

- **ProVista** – new release(s) from The Scotts Co. and marketed by Bethel Farms.

ProVista™ St Augustine is ready in Florida ProVista turf grows at half the rate of Floratam, mowing down to 20x annually, significant savings year-after-year. For pennies more than Floratam, owners can see ROI in as little as 11 months. ProVista complete weed control, Greenlight is a glyphosate herbicide approved to spray directly on ProVista to kill both grassy and broadleaf weeds, including Bermuda/ Carpetgrass, no damage to ProVista. We look forward to show you the future of turf with ProVista!



ProVista St. Augustinegrass

Reduce Your Largest Cost While Achieving Superior Results

*Labor is the most significant issue preventing landscapers from growing and making a profit.

ProVista enables landscapers to deliver a premium landscape with significantly less labor and cost.

Typical Share of Spending

Fert & Weed Control

20%

Other Maintenance

20%

Mowing

60%

[Contact Us](#)

**Based on Scotts Proprietary Market Research.*



PROVISTA™

Have a Premium Landscape with Significantly Less Labor and Cost.

An innovative solution delivering beautiful turf with complete weed control and half the mowing.

[Contact Us](#)



FSA 1602

CitraBlueTM

46
St. Augustine

CitraBlue



Floratam



Zoysiagrass

Species of Zoysiagrass





Zoysia japonica

El Toro, JaMur, Empire, Palisades, UltimateFlora, Zenith and Icon,

- Coarse leaf texture
- Less dense and less thatch than *matrella* species
 - Good homeowner species
- Good shade tolerance
 - Variation among cultivars
- Good drought tolerance
 - Variation among cultivars
- Good rate of establishment
 - True for most newer cultivars
- Large patch disease response
 - All cultivars are susceptible
- Mowing heights: < 2.0"
- Empire is the most widely available and has become the standard for zoysiagrass in Florida.

Zoysia matrella

Zeon, Taccoa Green/PristineFlora, Geo, Carribean, L1-F and Diamond

- Very Fine to Fine leaf texture
- Extremely Dense and prone to thatch
 - Typically high maintenance landscapes
 - More susceptible to scalp damage
- Very good shade tolerance
 - Variation among cultivars
- Dense rhizome systems
- Less drought tolerant compared to *japonica* cultivars.
- Less winter hardy than *japonica*
- Better winter color retention than *japonica*
- Slow establishment
- Large patch disease response
 - All cultivars are susceptible
- Mowing heights:
 - Landscape use: 0.5” to 1.5”
 - Under shade: up to 1.5” (depends on cultivar)
- None are in widescale use or production in Florida
- Zeon was the cultivar used in Rio for the Olympic golf tournament.

El Toro



this slide Courtesy Brian Schwartz, UGA

The image shows a close-up, top-down view of a lush, green lawn. The grass consists of many small, narrow, blade-like leaves that are densely packed together, creating a continuous carpet of green. The lighting is bright and even, highlighting the texture and color of the foliage. In the upper-middle portion of the image, the word "JaMur" is printed in a bold, yellow, sans-serif font. The letters are slightly shadowed, giving them a three-dimensional appearance as if they are floating above or resting on the grass.

JaMur

JaMur



Empire



Empire



Palisades



Palisades





Zeon

Zeon



Taccoa Green/PristineFlora





Taccoa Green/ PristineFlora



Geo

Geo



Zenith Zoysiagrass

- A seeded zoysiagrass variety available in retail stores.
- Fast establishment.
- From 1996-2001, Zenith ranked 16 of 19 in NW Florida and 19 of 19 in Gainesville.



Zenith Zoysiagrass



8 weeks after seeding

Large Patch – Major Issue (*Rhizoctonia*)



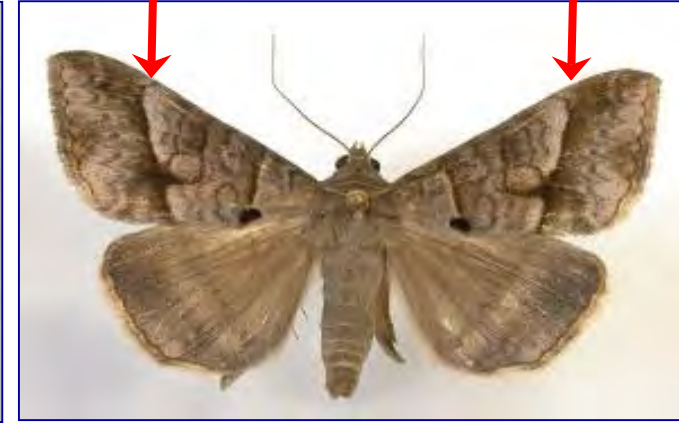
Pest Moths



Tropical sod webworm
Wingspan: ½ to 1"



Fall armyworm
Wingspan: ~ 1½"



Striped grass looper
Wingspan: 1½"







Billbugs (*Sphenophorus* spp.)



- Gray to black weevils
- Larvae are legless
- Hunting billbug has a Y-shaped area on pronotum with a parenthesis-like marking on each side
- Possibly 2+ generations each year in Florida

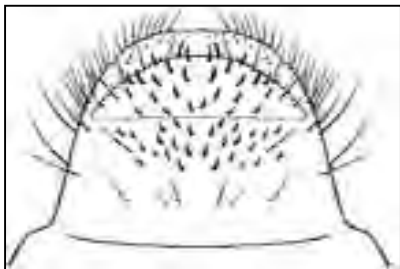
Scarab Beetles

(Coleoptera: Scarabaeidae)

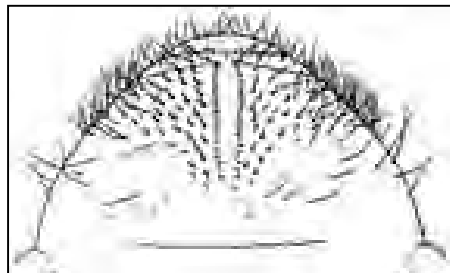
- Dung beetles and plant-feeders (1400 N. American species)
- Scarabs vary in size, color, and habits, but adults can be recognized by their 3-segmented, clubbed antennae
- Larvae molt 3 times (have 3 instars)



Masked Chafers *Cyclocephala* spp.



May/June Beetles (*Phyllophaga* spp.)



Green June Beetle (*Cotinis nitida*)





Zoysiagrass Drought Response



Cultural Practices Needed



Bahiagrass	Bermudagrass	Centipedegrass	St. Augustinegrass	Zoysiagrass
Few	Verticutting – every other year	Verticutting – every few years	Verticutting – every other year	Verticutting – every year?
Aeration	Aeration	Aeration	Aeration	Aeration

Optimal Mowing Practices



	Bahiagrass	Bermudagrass	Centipedegrass	St. Augustinegrass	Zoysiagrass
Equipment	Rotary	Rotary or Reel	Rotary	Rotary	Rotary or Reel
Height of Cut	3 – 4"	1 – 2"	1.5 – 2.5"	2 – 4" (cultivar dependent)	0.25 – 2.5" (cultivar dependent)
Quality of Cut	Poor	Moderate	Good	Moderate	Poor

Shade Tolerance

Bahiagrass	Bermudagrass	Centipedegrass	St. Augustinegrass	Zoysiagrass
Poor	Poor New cultivars have improved shade tolerance	Fair	Good Dwarf-types are better.	Good Fine-textured appear to be better

DLI Requirements

Turfgrass Cultivar	DLI requirements (mol m ⁻² d ⁻¹)		
	Summer	Winter	Spring
Tifway hybrid bermudagrass	21.0	10.6	17.9
TifGrand hybrid bermudagrass	19.9	9.8	14.6
Celebration common bermudagrass	19.6	8.8	14.9
Argentine bahiagrass	15.3	7.2	10.2
TifBlair centipedegrass	13.4	9.5	14.1
SeaDwarf seashore paspalum	13.2	8.0	11.9
Floritam St. Augustinegrass	11.8	8.5	11.6
Diamond zoysiagrass (matrella)	11.3	7.4	10.9
Palisades zoysiagrass (japonica)	11.2	8.2	11.2
Captiva St. Augustinegrass	10.9	8.0	11.5
Pristine zoysiagrass (matrella)	10.8	7.3	10.6
JaMur zoysiagrass (japonica)	10.3	6.8	10.5



Insect Problems

	Bahiagrass	Bermudagrass	Centipedegrass	St. Augustinegrass	Zoysiagrass
Primary Insect Problems	Mole Cricket Ground Pearls	Mole Crickets Webworms Armyworms White Grubs	Spittle Bugs Ground Pearls Webworms	Chinch Bugs Webworms White Grubs	Billbugs Webworms Mole Crickets White Grubs



Disease Problems

	Bahiagrass	Bermudagrass	Centipedegrass	St. Augustinegrass	Zoysiagrass
Primary Disease Problems	Dollar Spot	Leaf Blights Dollar Spot	Centipede Decline Large Patch	Take-All Root Rot Large Patch Gray Leaf Spot	Large Patch Dollar Spot Rust
Nematodes	Uncommon	Common	Occasional	Occasional	Occasional

Herbicide Options

	Bahiagrass	Bermudagrass	Centipedegrass	St. Augustinegrass	Zoysiagrass
Grassy-Weed Herbicides	PRE: Many POST: Few	PRE: Many POST: Many	PRE: Many POST: Few	PRE: Many POST: NONE	PRE: Many POST: Many
Broadleaf Weed Herbicide Tolerance	Many are damaging	Most are safe	Many are damaging	Many are damaging	Most are safe

Overview

- Selecting the Right Turfgrass
 - The pros and cons of available options
- Establishing/Reestablishing Your Lawn
 - To sod or not to sod?
- Irrigation or irritation
 - PVC pipes are no match for fallen trees!
- Fertilizing Damaged Turf
 - Don't add insult to injury!

Warm-season grasses

- Best time to establish in spring or summer
- Winter dormancy induced due to lower temperatures and reduced daylength
- Most establish vegetatively (sod, sprigs, stolons, rhizomes)

Turfgrass Establishment

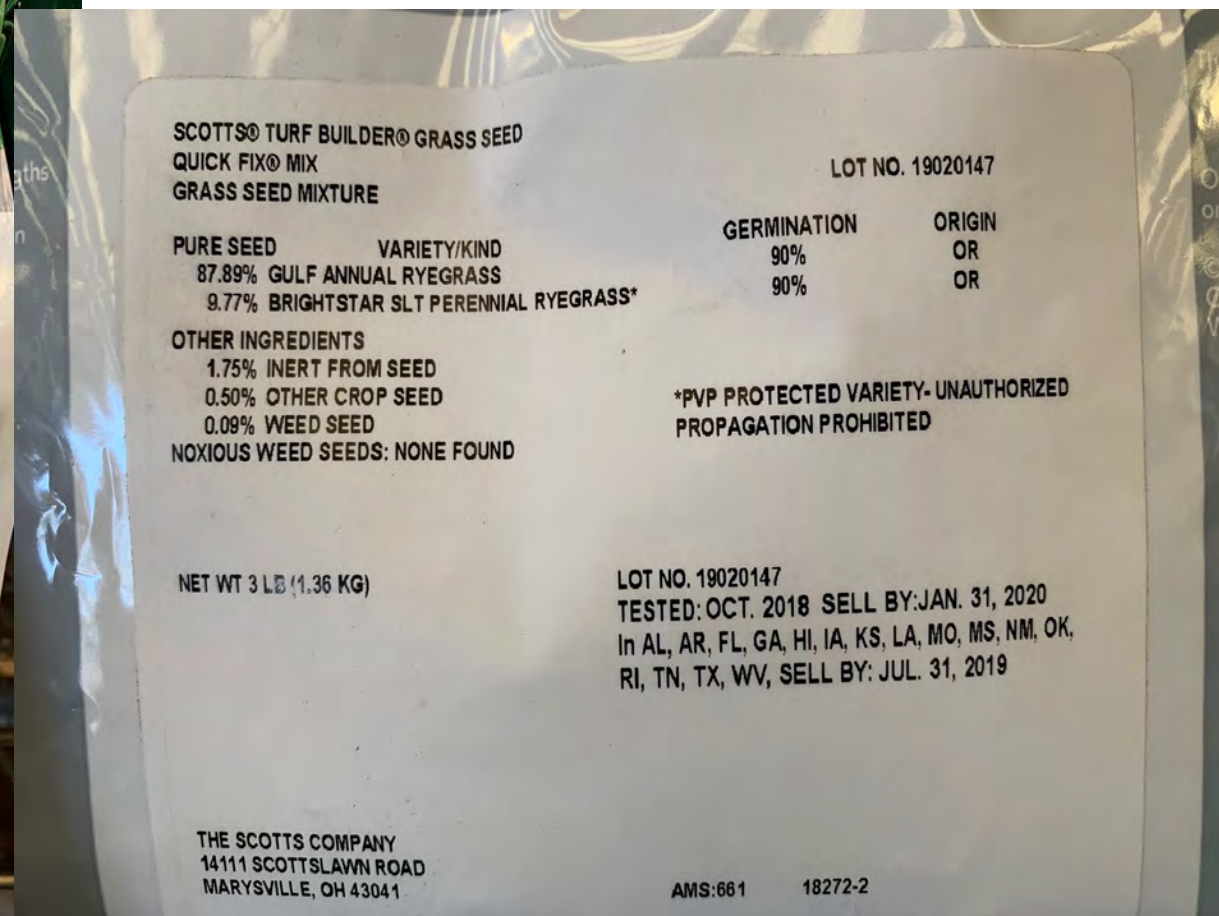
Sequence of Events

- Clean and Rough Grade
- Soil Analysis
- Install Irrigation Equipment
- Soil Amendments
- Deep Tillage
- Final Grading
- Planting
- Irrigation
- Post-planting Care

Establishment Methods



Bahiagrass	Bermudagrass	Centipedegrass	St. Augustinegrass	Zoysiagrass
Seed Sod	Seed Sprigs Plugs Sod	Seed Plugs Sod	Plugs Sod	Seed Sprigs Plugs Sod



Turfgrass Science

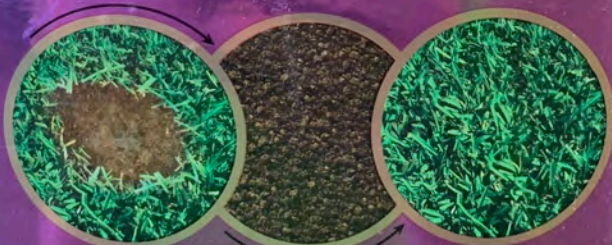


READY-TO-USE
MULCH & FERTILIZER

Scotts

ezpatch™
LAWN REPAIR

HELPS ST. AUGUSTINEGRASS
REPAIR 60% FASTER*



FOR ST. AUGUSTINE LAWNS™

DOES NOT CONTAIN SEED

*Results 15 days after application vs untreated control. Results may vary.

NET WT / PESO NETO 3.75 lb (1.70 kg)

ALL COVER UP TO
85
SQUARE
FEET

1. PREP • PREPARE

Prepare the area where you want to establish new plug plants or repair bare areas (where gaps between live plants are 12" or less) by removing dead grass and loosening hard soil.

Prepara el área en donde quiere establecer plantas de almáciga nuevas o reparar las áreas ralas (donde los espacios entre las plantas vivas son 30.5 cm o menos) eliminando el césped muerto y aflojando la tierra dura.

2. APPLY • APLIQUE

Evenly apply EZ Patch Lawn Repair so the area is covered and ground is visible. Use half for thin areas.

Aplique EZ Patch Lawn Repair de manera uniforme para cubrir el área, sin dejar nada de tierra a la vista. Use la mitad en las áreas ralas.

Scotts® EZ Patch™

Lawn Repair for St. Augustine Lawns 2-0-0

GUARANTEED ANALYSIS

Total Nitrogen (N)..... 2%
2% urea nitrogen+

Derived from polymer coated sulfur coated urea
+ The nitrogen has been coated to provide 1.10% slow-release nitrogen (N)

Only apply to actively growing turf. Do not apply near water, storm drains, or drainage ditches. Do not apply if heavy rain is expected. Apply this product only to your lawn and sweep any product that lands on the driveway, sidewalk, or street, back onto your lawn.

Information regarding the contents and levels of metals in this product is available on the internet at <http://www.regulatory-info-sc.com>

INGREDIENTS: Mulch (coir pith fiber)

The Scotts Company
14111 Scottslawn Road, Marysville, Ohio 43041

©2015 The Scotts Company LLC World rights reserved
17520-1

CAUTION: Keep out of reach of children. Store in original container.
PRECAUCIÓN: mantenga fuera de alcance de los niños. Almacenar en envase original.

*Results 15 days after application vs untreated control. Results may vary.



One Step Complete Seeding Mixture
For Bermudagrass Areas 0.6 - 0 - 0 MAT: 100522283
Bermudagrass Blend NET WT: 5 POUND

PURE SEED	VARIETY	KIND	GERMINATION	ORIGIN
1.71%	MOHAWK		80%	AZ/CA
	BERMUDAGRASS (UNHULLED)			
0.19%	SULTAN BRAND FMC-6		80%	AZ
	BERMUDAGRASS (UNHULLED)			

0.00% OTHER CROP SEED
98.10% INERT MATTER*
0.00% WEED SEED

*(CONSISTS OF 93.00% MULCH, 5.00% FERTILIZER,
0.10% INERT FROM SEED)

NOXIOUS WEED: NONE FOUND PER POUND (LICENSE # F1171)

GUARANTEED ANALYSIS:

Total Nitrogen (N) 0.60%
0.60% Urea Nitrogen

Derived From: Urea

SOIL AMENDING GUARANTEED ANALYSIS

Active Ingredients:

93.00% Wood Fiber Mulch
Soil Amendment Inert Ingredients:

2.00% Seed

5.00% Fertilizer

IN CALIFORNIA, CONTAINS SOIL AMENDING INGREDIENT
93.00% Wood Fiber Mulch

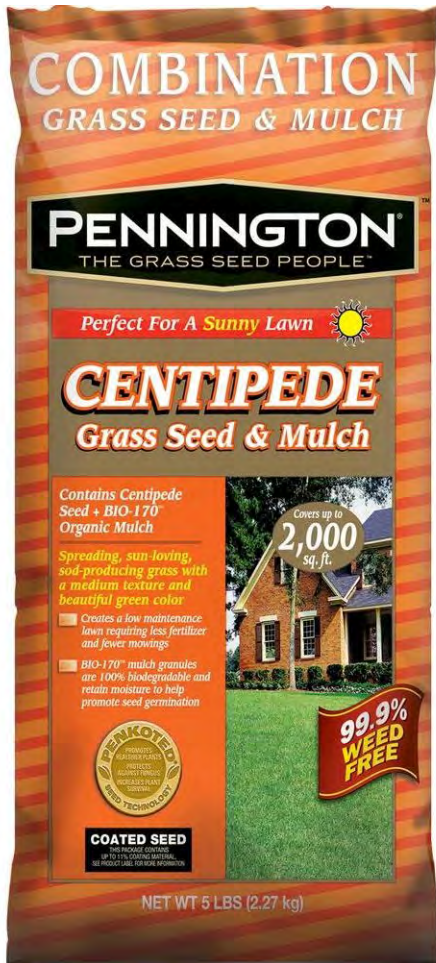
LOT# MH18WWB008



TEST DATE: 03-18

Lot: MH18WWB008 Test Date: 09/2018
IN AK, AZ, CA, DE, ID, MN, NV, OR, UT, WA & WY SELL BY: 12/31/2018
IN CO, IL, MA, MT, NE & WI SELL BY: 09/30/2019

In all other states, SELL BY: 06/30/2019
Pennington Seed Inc.
PO BOX 338 GREENFIELD MO 65661



\$39.98



\$37.44



\$39.98



\$23.48





Scotts® EZ Seed® Patch & Repair Centipede Grass 1-0-0			
17541-1	Seed Guarantee	Lot No: 19080147	
Pure Seed	Variety/Kind	Origin	Germi- nation
0.98%	Centipede Grass	GA	85%
Other Ingredients			
99.00%	Inert Matter		
91.10%	Mulch		
3.90%	Fertilizer		
3.00%	Polysaccharides		
1.00%	Seed Coating		
0.01%	Other Crop Seed		
0.01%	Weed Seed		
Noxious Weed Seed - None Found			
Lot No. 19080147			
Tested: 03/2019		SELL BY: 12/31/19	
In IL, MT, NY, OH, SD, & WY SELL BY 03/31/20			
In AK, AZ, CA, CO, DE, ID, IN, MD, MN, ND, NH, NV, OR, UT, VT, WA, WI & DC SELL BY: 06/30/20			
Scotts® EZ Seed® Patch & Repair Centipede Grass 1-0-0			
Fertilizer Guaranteed Analysis		F643	
Total Nitrogen (N).....1%			
1% Urea Nitrogen ***			
Derived from polymer-coated sulfur-coated urea			
***The nitrogen has been coated to provide 0.55% coated slow-release nitrogen (N)			
Ingredients: Mulch (coir pith fiber), Polysaccharides (tackifier)			
Do not apply near water, storm drains, or drainage ditches. Do not apply if heavy rain is expected. Apply this product only to your lawn, and sweep any product that lands on the driveway, sidewalk, or street, back onto your lawn.			
Information regarding the contents and levels of metals in this product is available on the Scotts website.			



PENNINGTON
THE GRASS SEED PEOPLE®



Pensacola Bahiagrass

PENKOTED® GRASS SEED

EXCELLENT SUN & DROUGHT TOLERANCE

Better Winter Hardiness and

Mejor resistencia al invierno y mejor calidad de

Produces a Tough, Dense, Low

Even in Poor Soil Condition

Produce un césped fuerte, denso y de bajo mante



COATED SEED

This package contains up to 53% coat

See product label for more information

PENSACOLA BAHIAGRASS

MAT: 100081057

Net Wt: 10 LB

Pure
Seed
49.76%

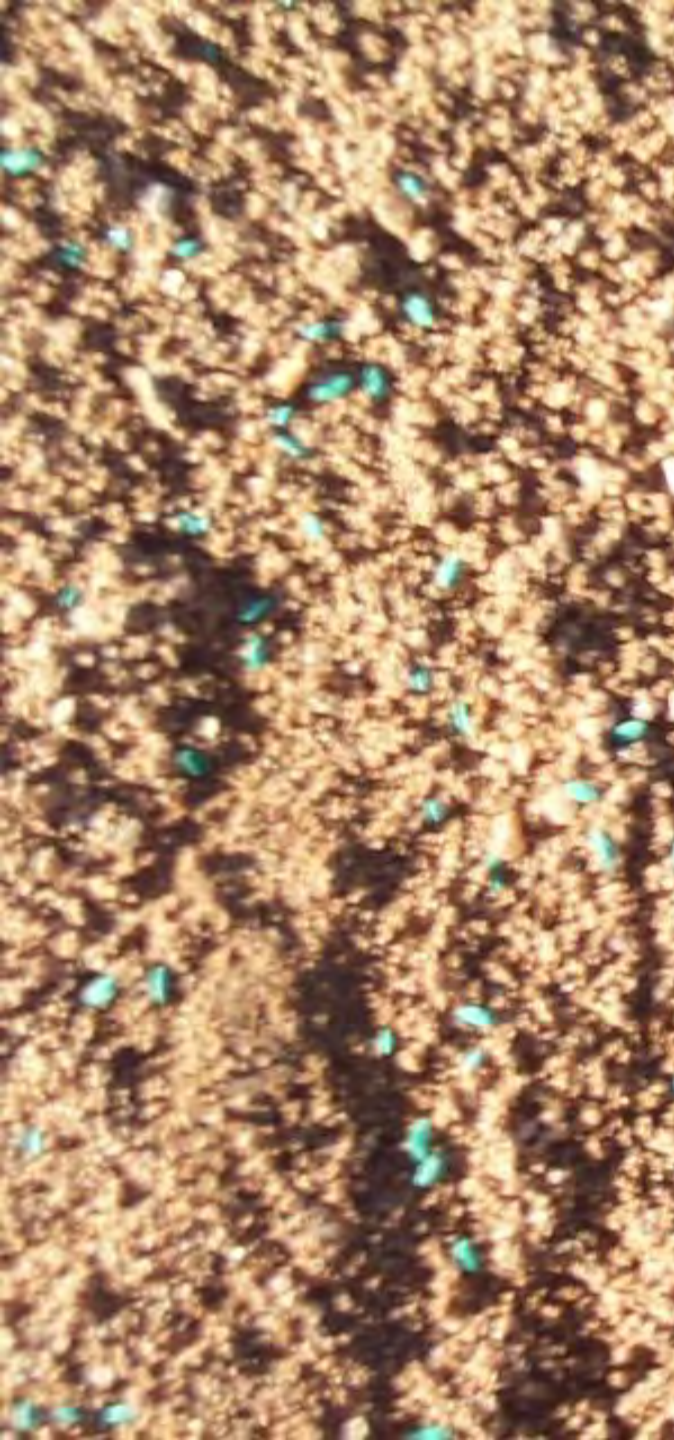
Variety / Kind
PENSACOLA BAHIAGRASS

Germination
75%

Dorm
Seed
10%

Total
Germ
85%

Origin
FL



Seeding

- 0.6 lbs /1,000 or 26 lbs/Acre.
- Lower seeding rate allows for more stolon development.

June 11, 2003



Hydroseeding



Hydroseeding



Zenith Zoysiagrass

- A seeded zoysiagrass variety available in retail stores.
- Fast establishment.
- From 1996-2001, Zenith ranked 16 of 19 in NW Florida and 19 of 19 in Gainesville.



Turfgrass Establishment - *Plugging*

- Plugging is the planting of 2 - 4" plugs of mature turf into the soil.
- Common with zoysiagrass, St. Augustinegrass, centipedegrass, seashore paspalum, and buffalograss.
 - Planted on 6 - 18" centers.
 - The bigger the plug the farther apart they can be planted.
 - After planting, the site should be rolled.





7 Aug



30 Aug



27 Sept

LAWN SIZE	BEST SPACING ! Spacing Diagonal 12 " Apart # of Plugs	NUMBER OF PLUG ORDERS NEEDED 36 @ 3" x 3" Plugs Various Varieties Approximately 64 sq. ft. per 36 plugs
100 SF	56	2
500 SF	281	8
1000 SF	562	16
2000 SF	1124	32
3000 SF	1686	46
4000 SF	2248	62
5000 SF	2810	78
10000 SF	5625	156
20000 SF	11250	312

LAWN SIZE	Spacing Diagonal 18 " Apart # of Plugs	# OF ORDERS NEEDED 36 @ 3" x 3" Plugs Approximately 112 sq. ft. per 36 plugs
100 SF	45	2
500 SF	225	6
1000 SF	450	13
2000 SF	900	25
3000 SF	1350	38
4000 SF	1800	50
5000 SF	2250	63
10000 SF	4500	125
20000 SF	9000	250

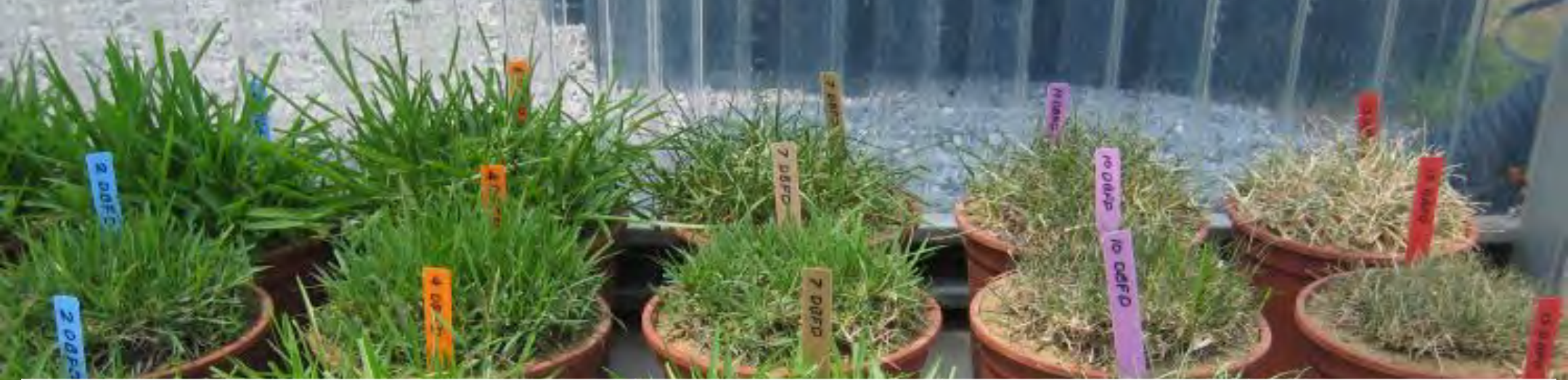


Sodding

Overview

- Selecting the Right Turfgrass
 - The pros and cons of available options
- Establishing/Reestablishing Your Lawn
 - To sod or not to sod?
- Irrigation or irritation
 - PVC pipes are no match for fallen trees!
- Fertilizing Damaged Turf
 - Don't add insult to injury!

Comparative Water Use



Bahiagrass	Bermudagrass	Centipedegrass	St. Augustinegrass	Zoysiagrass
Excellent – maintains green color under drought conditions but can wilt and go dormant.	Excellent – turns bluish gray under reduced water. Will eventually turn brown.	Good – persists on less water but can wilt quickly in the absence of water.	Good – wilts, but some leaves remain green for longer periods of time.	Excellent – but can wilt quickly in the absence of water. Within 1-2 weeks, the leaves will be brown and the turf will go dormant.

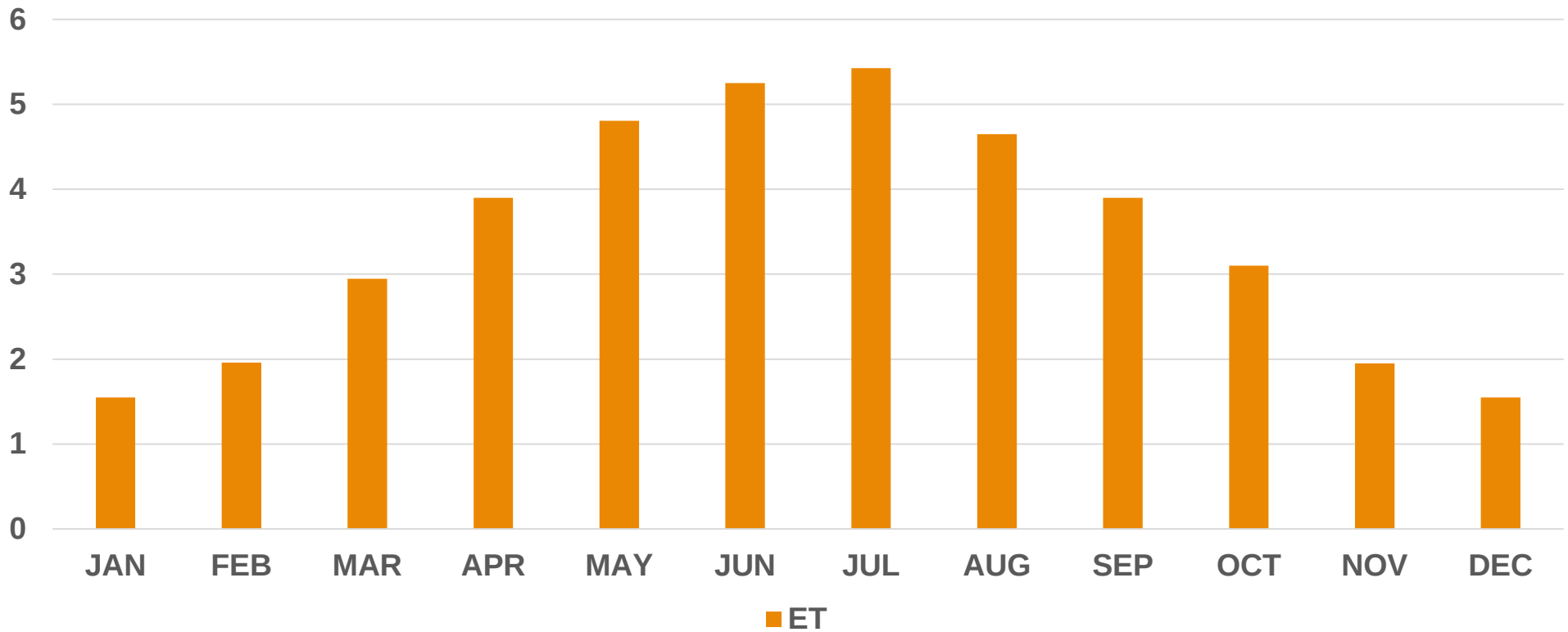
Evapotranspiration (ET)

- Evaporation (E)
 - Process of water movement, in the form of vapor, into the atmosphere from soil, water, or plant surfaces.
- Transpiration (T)
 - Evaporation of water from plant stomata into the atmosphere.
- Evapotranspiration (ET)
 - Sum of evaporation and transpiration.



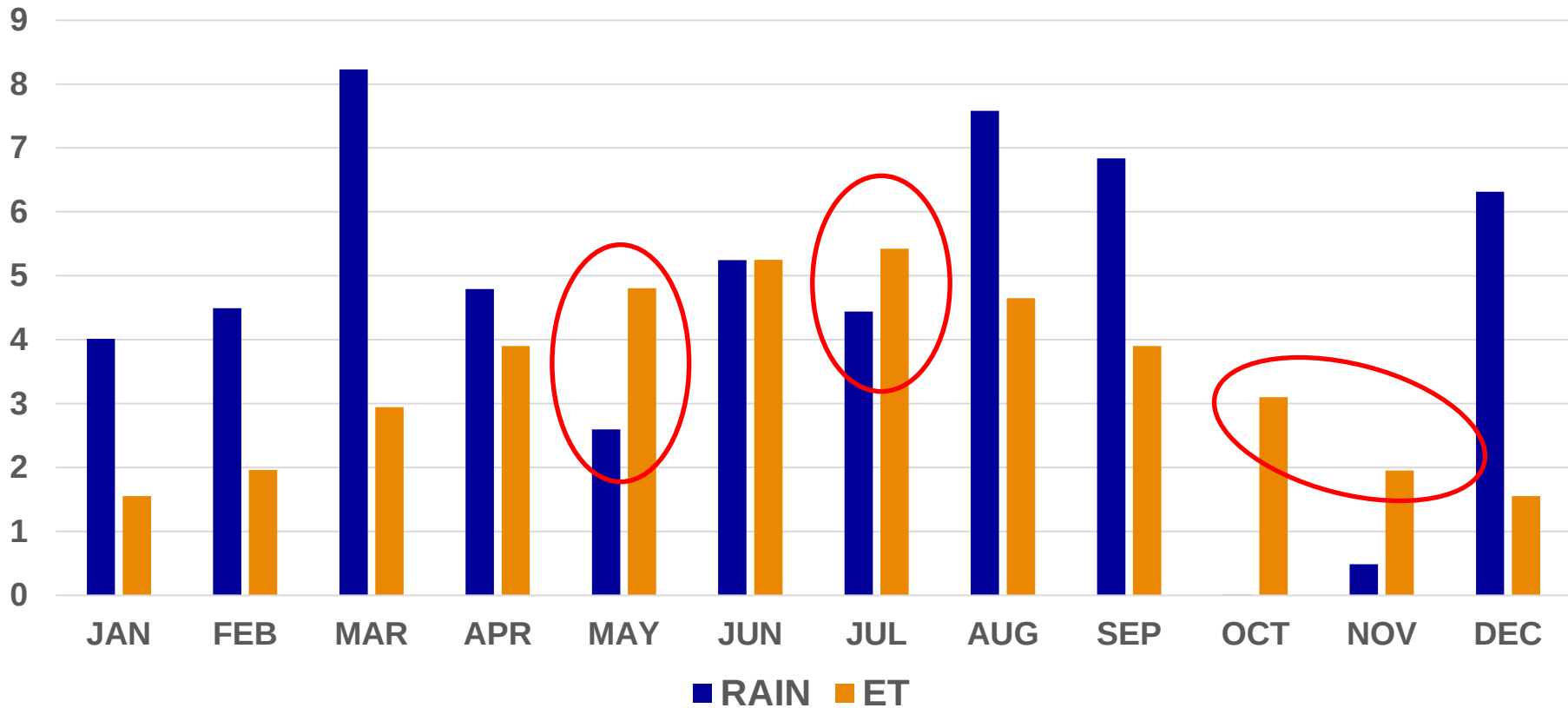
Evapotranspiration

Florida Panhandle



Rainfall vs. Evapotranspiration - 2016

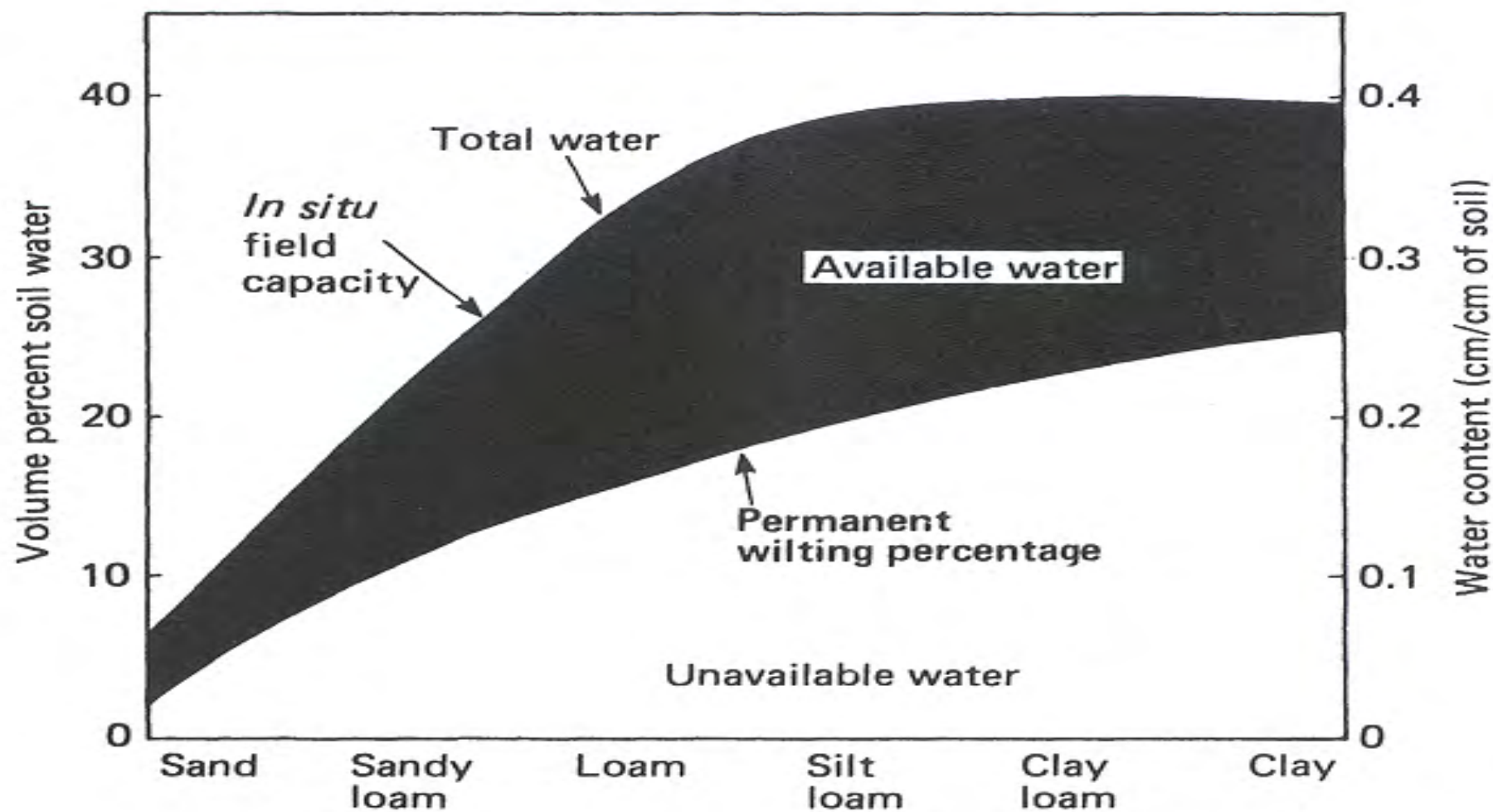
Florida Panhandle



Irrigation Needs – Florida Panhandle

	Daily ET	Weekly ET	67%
JAN	0.05	0.35	0.23
FEB	0.07	0.49	0.33
MAR	0.10	0.67	0.45
APR	0.13	0.91	0.61
MAY	0.16	1.09	0.73
JUN	0.18	1.23	0.82
JUL	0.18	1.23	0.82
AUG	0.15	1.05	0.70
SEP	0.13	0.91	0.61
OCT	0.10	0.70	0.47
NOV	0.07	0.46	0.30
DEC	0.05	0.35	0.23

Irrigation Planning



Plant Available Water

- Water held in the soil between field capacity (θ_{fc}) and permanent wilting point (θ_{wp}).
 - “Available” for plant use
- Available Water Capacity (AWC)
 - $AWC = \theta_{fc} - \theta_{wp}$
 - Units: depth of available water per unit depth of soil, “unitless” (in/in, or mm/mm)
 - Measured using field or laboratory methods

Soil Hydraulic Properties and Soil Texture

Table 2.3. Example values of soil water characteristics for various soil textures.*

Soil texture	θ_{fc}	θ_{wp}	AWC
----- in/in or m/m -----			
Coarse sand	0.10	0.05	0.05
Sand	0.15	0.07	0.08
Loamy sand	0.18	0.07	0.11
Sandy loam	0.20	0.08	0.12
Loam	0.25	0.10	0.15
Silt loam	0.30	0.12	0.18
Silty clay loam	0.38	0.22	0.16
Clay loam	0.40	0.25	0.15
Silty clay	0.40	0.27	0.13
Clay	0.40	0.28	0.12

* Example values are given. You can expect considerable variation from these values within each soil texture.

Effective Root Zone

- The Effective Root Zone is the depth of soil from which plants can draw nutrients and water.
 - A tree or shrub may have an effective root zone of several feet.
 - A zoysiagrass turf may have only 4” of an effective root zone.

Total Available Water (TAW)

- TAW = total available water capacity within the plant root zone, (inches)
 - $TAW = (AWC) (R_d)$
 - AWC = available water capacity of the soil, (inches of H_2O /inch of soil)
 - R_d = depth of the plant root zone, (inches)

Total Available Water (TAW)

- Example: Bermudagrass growing on sand.

– $TAW = (AWC) (R_d)$

– $TAW = (0.08) (4'')$

– $TAW = 0.32''$ water in the root

Table 2.3. Example values of soil water characteristics for various soil textures.*

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* Example values are given. You can expect considerable variation from these values within each soil texture.



**Irrigation Uniformity –
*ABSOLUTELY ESSENTIAL***





Catch Can Test

Overview

- Selecting the Right Turfgrass
 - The pros and cons of available options
- Establishing/Reestablishing Your Lawn
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UF/IFAS Recommendations

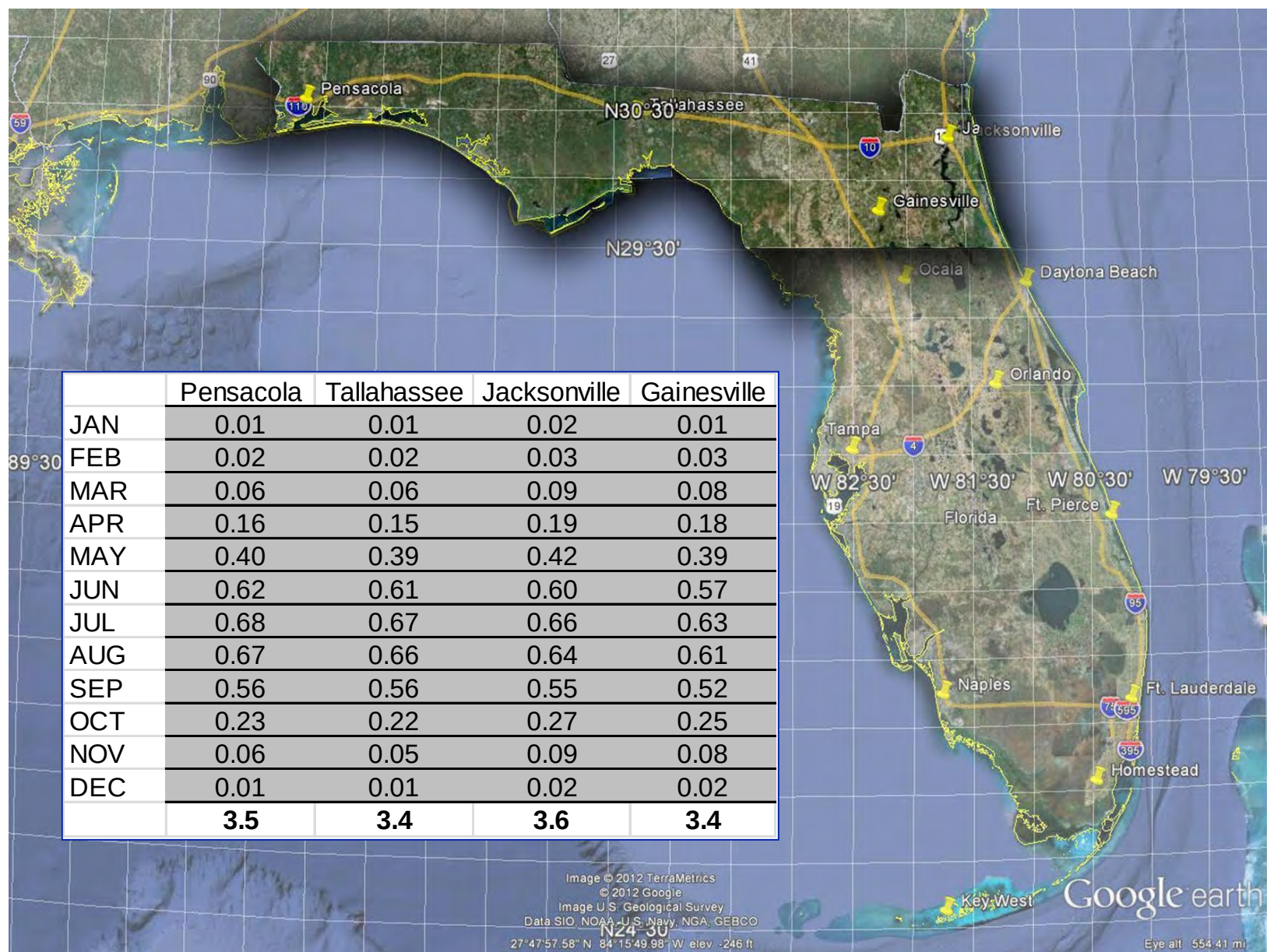
Table 1. Fertilization Guidelines for Established Turfgrass Lawns

	Nitrogen Recommendations (lbs 1,000 ft ⁻² year ⁻¹) ^{1, 2}		
	North Florida	Central Florida	South Florida
Bahiagrass	1.0 – 3.0	1.0 – 3.0	1.0 – 4.0
Bermudagrass	3.0 – 5.0	4.0 – 6.0	5.0 – 7.0
Centipedegrass	0.4 – 2.0	0.4 – 3.0	0.4 – 3.0
St. Augustinegrass	2.0 – 4.0	2.0 – 5.0	4.0 – 6.0
Zoysiagrass	2.0 – 3.0	2.0 – 4.0	2.5 – 4.5

¹Because homeowner preferences for lawn quality and maintenance level will vary; we recommend a range of fertility rates for each grass and location. Additionally, effects within a localized region (i.e., micro-environmental influences -- such as shade, drought, soil conditions, and irrigation) will necessitate that a range of fertility rates be used.

²These recommendations assume that grass clippings are left on the lawn.

Growth Potential Modeling



Overview

- Selecting the Right Turfgrass
 - The pros and cons of available options
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J. Bryan Unruh, Ph.D.
West Florida Research and Education Center
University of Florida/IFAS
jbu@ufl.edu