

# **TifTuf Bermuda (DT-1)**

## **University of Georgia Tifton Campus**



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# Plant Responses to Drought

- **Avoidance**
  - Deeper root extension
- **Escape**
  - Drought dormancy
- **Tolerance**
  - Osmotic adjustment, membrane stability, etc.
  - Aka: USING LESS WATER

**DT-1 “Selected” in 2001**



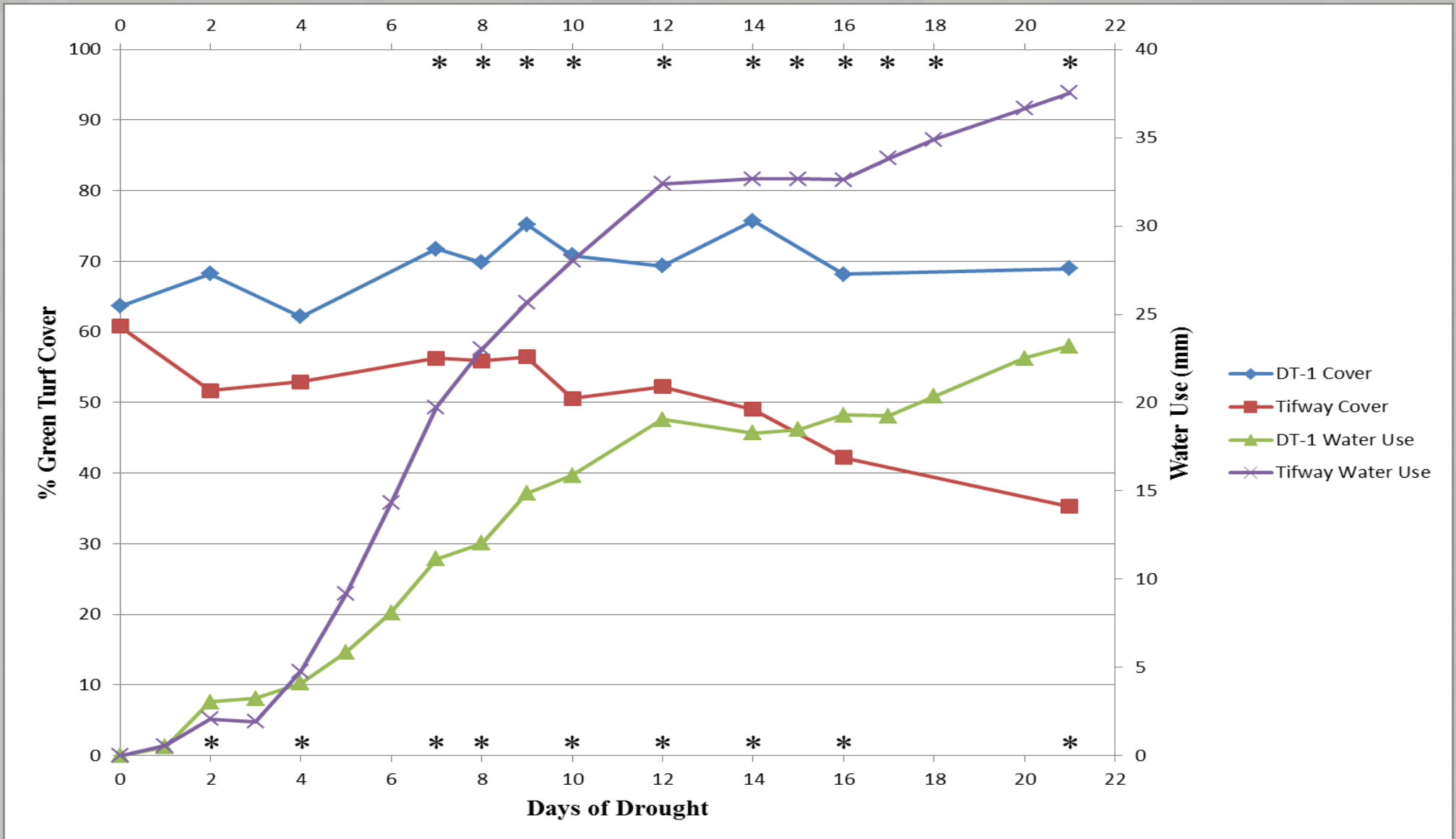


**Tifway**

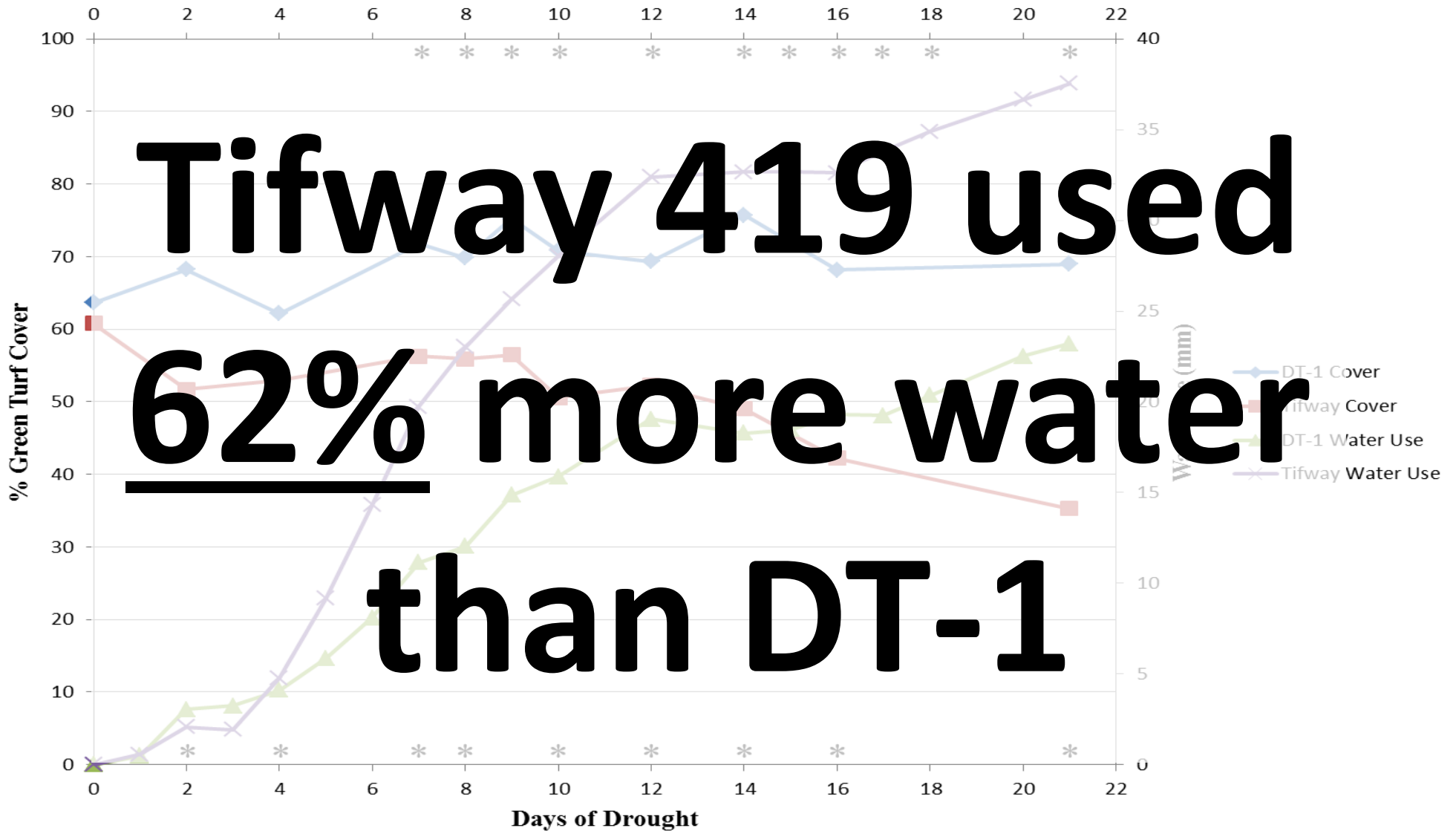


**DT-1**

# Short-Term Drought (Atlanta)

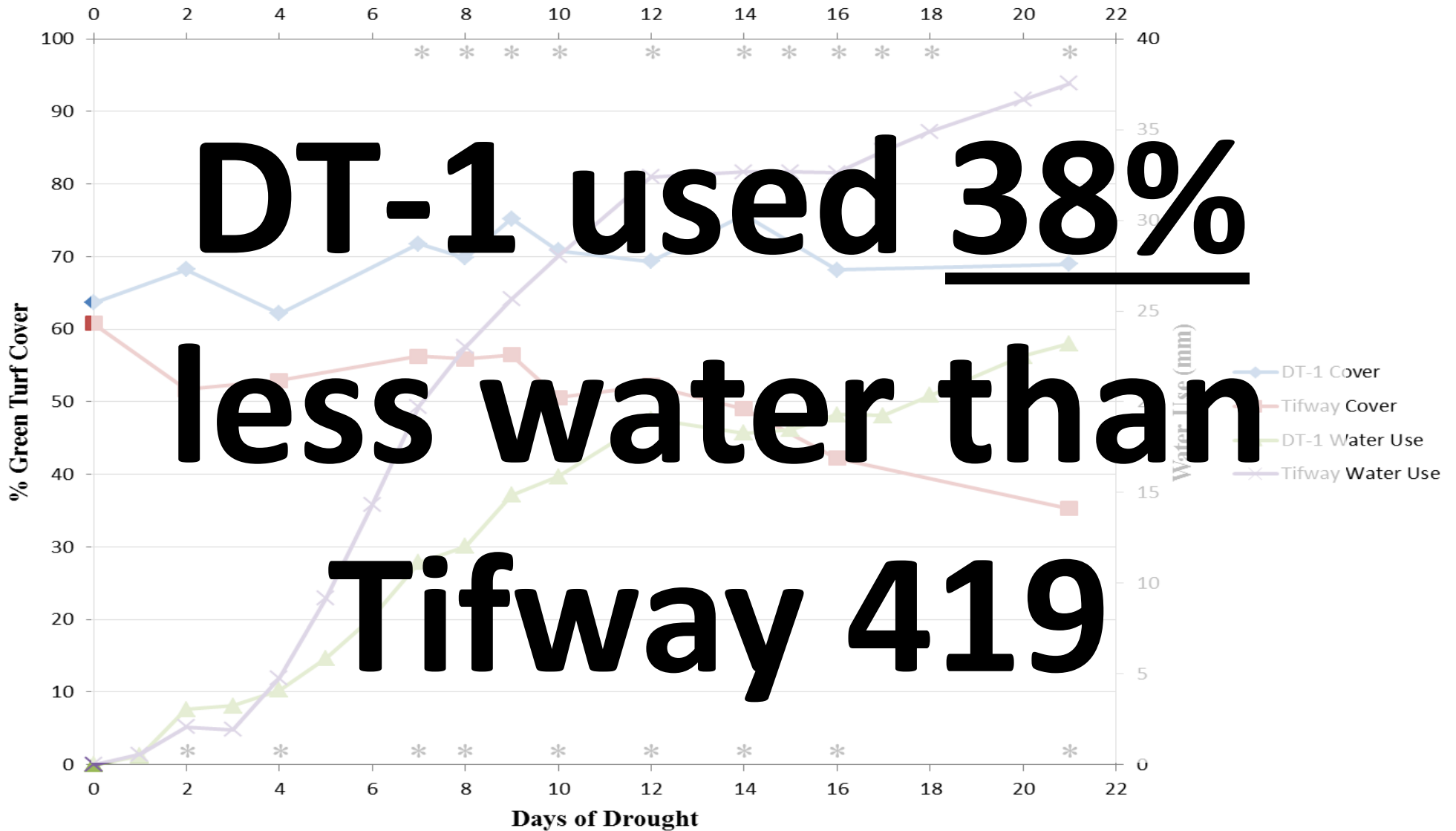


# Short-Term Drought (Atlanta)

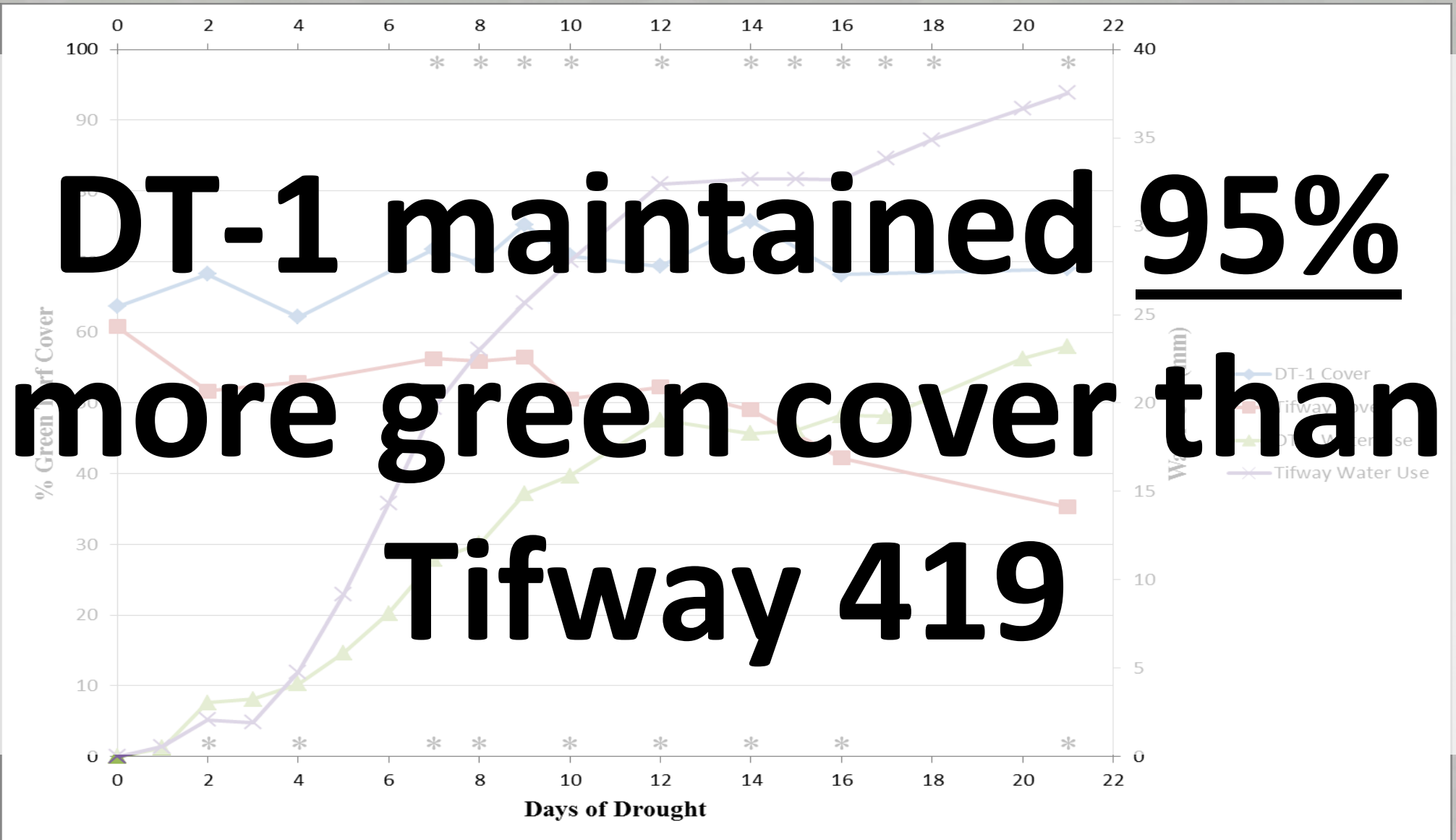


**Tifway 419 used  
62% more water  
than DT-1**

# Short-Term Drought (Atlanta)



# Short-Term Drought (Atlanta)





# Short & Long-Term Drought (USA)

Table 1. Mean non-stressed and stressed turfgrass quality of three bermudagrasses mowed at 2.0” in field trials<sup>1</sup> at seven locations across the United States during 2011, 2012, and 2013.

Genotype	Turf quality <sup>2</sup>			Stress turf quality <sup>3</sup>		
	South <sup>4</sup>	North <sup>5</sup>	All	South	North	All
	Visual rating			Visual rating		
DT-1	<b>7.3 a</b> <sup>6</sup>	7.3 a	<b>7.3 a</b>	<b>5.9 a</b>	<b>6.0 a</b>	<b>5.9 a</b>
Tifway	6.2 b	7.1 a	6.7 b	4.2 b	4.3 b	4.2 b
Celebration	5.8 b	6.1 b	5.9 c	3.4 b	4.2 b	3.9 b

# Short & Long-Term Drought (USA)

**Under drought stress,  
Tifway 419 and  
Celebration went  
dormant, while DT-1  
remained ACCEPTABLE**

Table 1. Mean non-stressed and stressed turfgrass quality of three bermudagrasses mowed at 2.0" in field trials<sup>1</sup> at seven locations across the United States (South, North, and All) during 2009 and 2010.

Genotype	Turf quality <sup>2</sup>			Stress turf quality <sup>3</sup>		
	South <sup>4</sup>	North <sup>5</sup>	All	South	North	All
DT-1	7.3 a <sup>6</sup>	7.3 a	7.3 a	5.9 a	6.0 a	5.9 a
Tifway	4.2 b	4.1 b	4.2 b	2.2 b	4.3 b	4.2 b
Celebration	5.8 b	6.1 b	5.9 c	3.4 b	4.2 b	3.9 b

# 2010 USDA Trials



**Tifway**



**Celebration**



**Latitude 36**



**DT-1**

# Long-Term Drought (Florida)

Table 2. Mean turfgrass quality of three bermudagrasses mowed at 1.5” averaged over four dates in 2010, 2011, and 2012 after sustained droughty conditions in the Linear Gradient Irrigation System (LGIS) evaluation at the West Florida Research and Education Center (WFREC) in Jay, FL<sup>1</sup>.

Genotype	Irrigation level (% ET <sub>0</sub> )								Average
	120	105	80	54	37	25	13	3	
	Visual rating <sup>2</sup>								
DT-1	<b>6.8 a</b> <sup>3</sup>	<b>6.6 a</b>	<b>6.4 a</b>	<b>6.3 a</b>	<b>6.3 a</b>	<b>5.8 a</b>	<b>4.7 a</b>	<b>4.6 a</b>	5.9
Celebration	4.7 b	4.5 b	4.3 b	3.9 b	3.7 b	2.8 c	2.1 c	2.2 c	3.5
Princess-77	4.7 b	4.6 b	4.3 b	4.3 b	4.1 b	3.9 b	3.1 b	2.9 b	4.0

<sup>1</sup>Field trial planted during 2010.

<sup>2</sup>Turf quality was rated on a 1 to 9 scale with 1 = dead, 5 = acceptable, and 9 = excellent.

<sup>3</sup>Means within columns followed by the same letter are not significantly different according to Fisher's LSD ( $P \leq 0.05$ ).

# Long-Term Drought (Florida)

**Under severe drought stress, Celebration and Princess-77 failed, while DT-1 remained ACCEPTABLE**

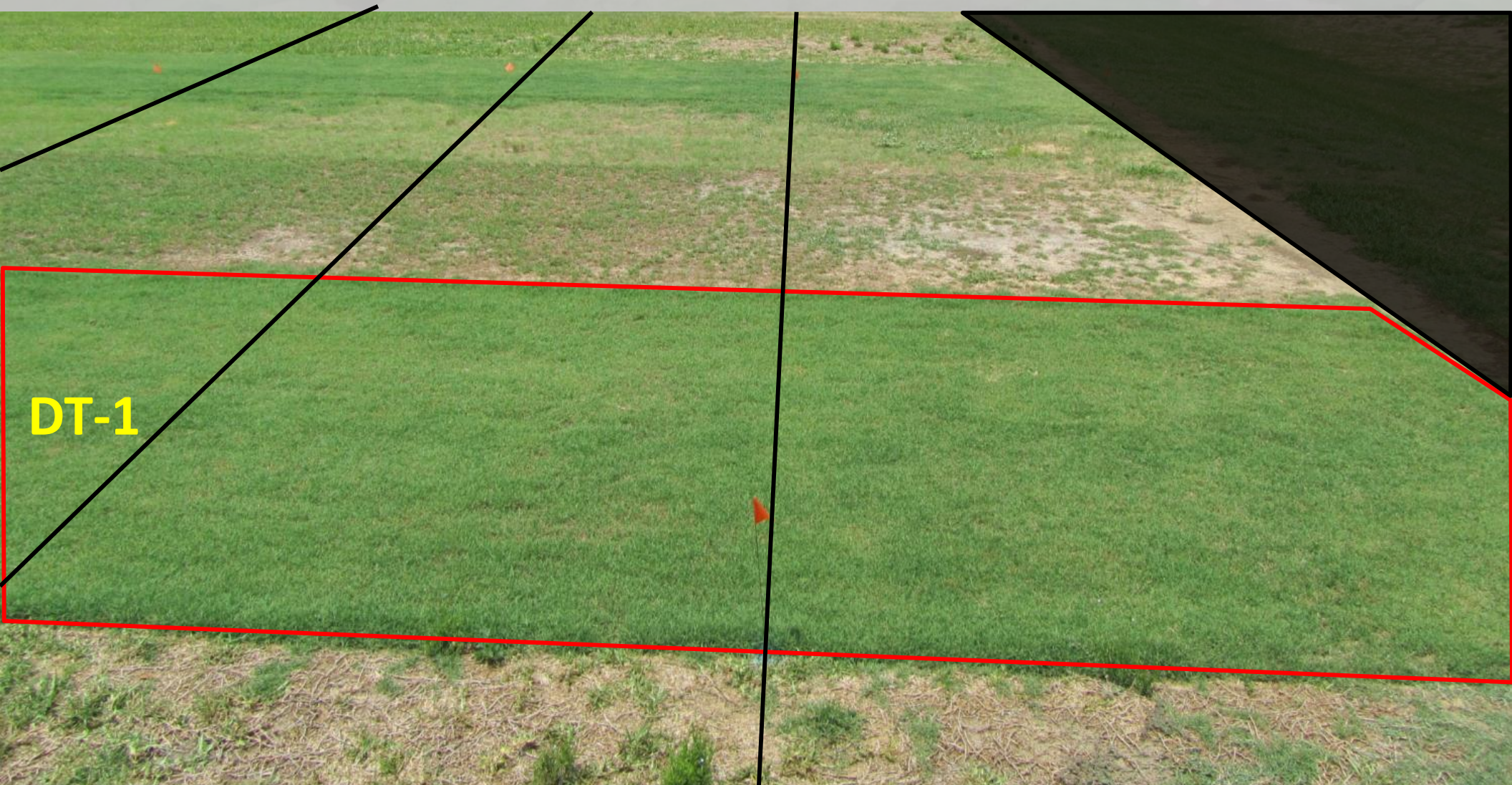
Table 2. Mean turfgrass quality of three bermudagrasses mowed at 1.5" averaged over four dates in 2010, 2011, 2012 after irrigation treatments at the Linear Gradient Irrigation System (LGIS) evaluation at the West Florida Research and Education Center (WFREC) in Jay, FL<sup>1</sup>.

Genotype	120	105	80	54	37	25	13	3	Average
DT-1	8.8 a	6.5 a	6.6 a	6.8 a	8.1 a	8.1 a	8.1 a	8.1 a	5.9
Celebration	4.7 b	4.5 b	4.3 b	3.9 b	3.7 b	2.8 c	2.1 c	2.2 c	3.5
Princess-77	4.7 b	4.6 b	4.3 b	4.3 b	4.1 b	3.9 b	3.1 b	2.9 b	4.0

<sup>1</sup>Field trial planted during 2010.  
<sup>2</sup>Turf quality was rated on a 1 to 9 scale with 1 = dead, 5 = acceptable, and 9 = excellent.  
<sup>3</sup>Means within columns followed by the same letter are not significantly different according to Fisher's LSD ( $P \leq 0.05$ ).

# Long-Term Drought (Florida)

- University Drought Trial during 2011 in Florida



# Long-Term Drought (Florida)

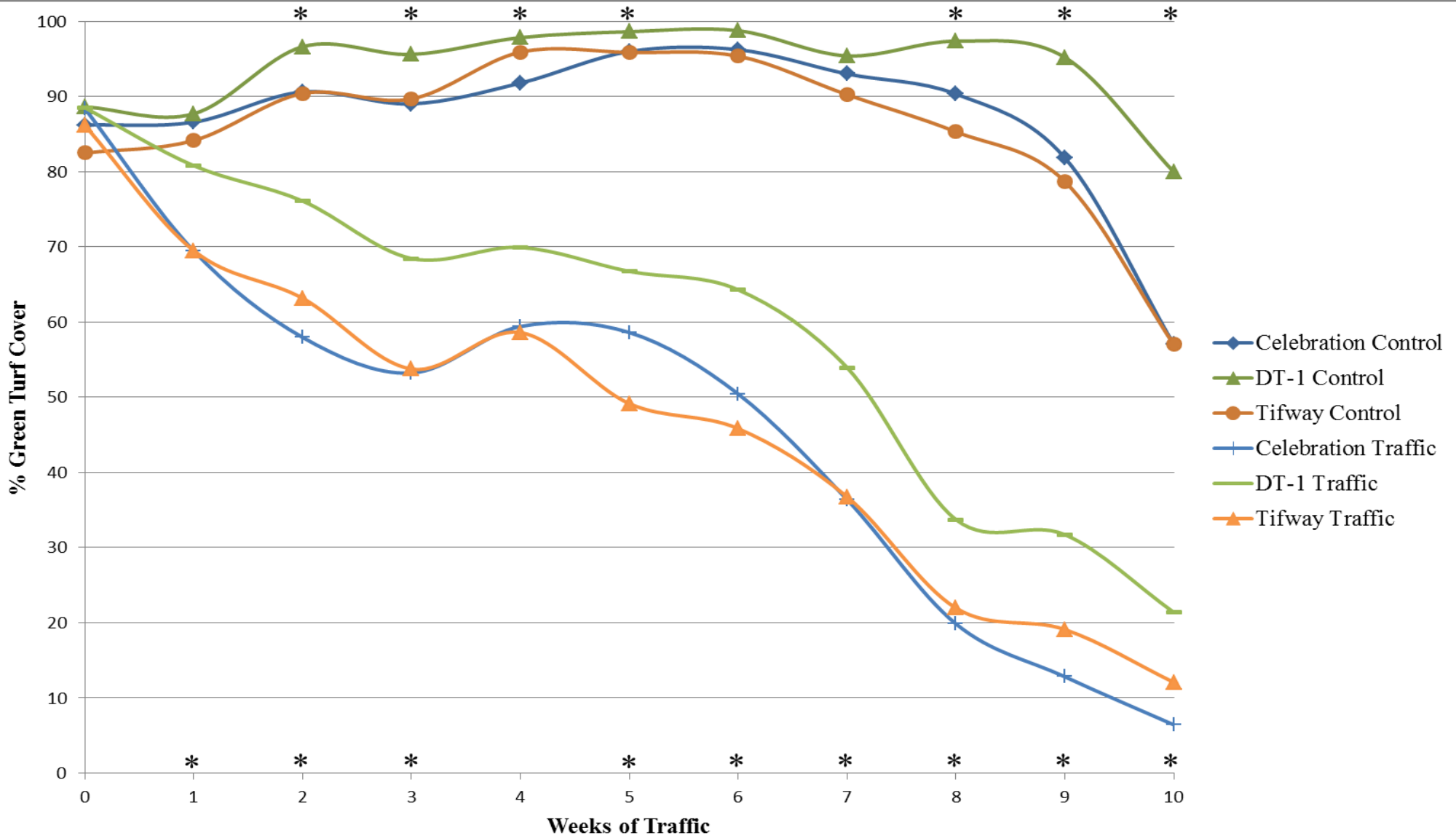


# Wear Trials





# Wear Trials



**Potential to Scalp?**



## Potential to Scalp?

**DT-1's genetic mechanism for wear recovery can lead to scalping where there is excess soil moisture and fertility in the ABSENCE of stress**

# Spring Green-Up


Table 5. Mean turfgrass cover and color of five bermudagrasses mowed at 1.5” in an irrigated, non-stressed field trial during 2012 and 2013 in Tifton, GA<sup>1</sup>.

Genotype	Turf cover <sup>2</sup>			
	Estab.	Green-up	Summer	Dormancy
	% green cover			
DT-1	<b>44 b<sup>3</sup></b>	<b>75 a</b>	91 a	<b>65 a</b>
Celebration	55 a	62 b	89 a	26 b

# Fall Dormancy


Table 6. Mean turfgrass quality, cover, and color of two bermudagrasses mowed at 1.5” in an irrigated, non-stressed<sup>1</sup> field trial during 2010 and 2011 in Tifton, GA<sup>2</sup>.

Genotype	Turf quality <sup>3</sup>			Turf cover <sup>4</sup>		
	April	June	Oct. <sup>1</sup>	April	June	Oct.
	Visual rating			% green cover		
DT-1	6.3 a <sup>5</sup>	7.5 a	<b>8.3 a</b>	89 a	85 a	<b>63 a</b>
Tifway	5.8 a	6.0 a	6.0 b	80 a	83 a	25 b



# Shade “Trials”

- Home Lawn Trials during 2013 in Georgia

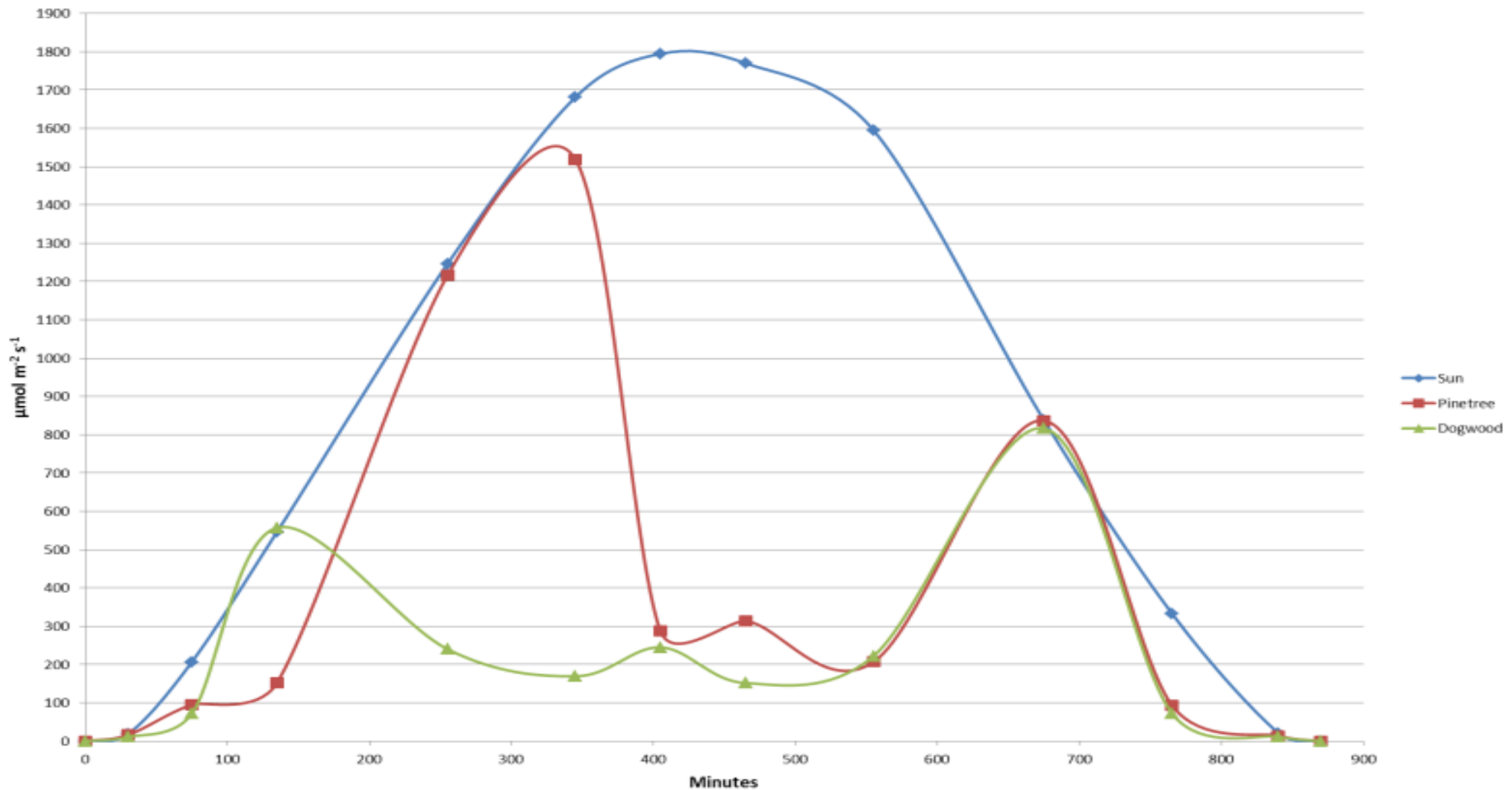
A photograph of a residential lawn with several large trees and shadows cast across the grass. The scene is outdoors, with a paved road and houses visible in the background. The text "Shade 'Trials'" is overlaid on a semi-transparent white box in the upper center of the image.

# Shade "Trials"

- Home Lawn Trials during 2014 in Georgia

# Shade "Trials"

Light Intensity in Different Areas of DT-1 Bermudagrass Yard in Tifton, GA on May 23 2014



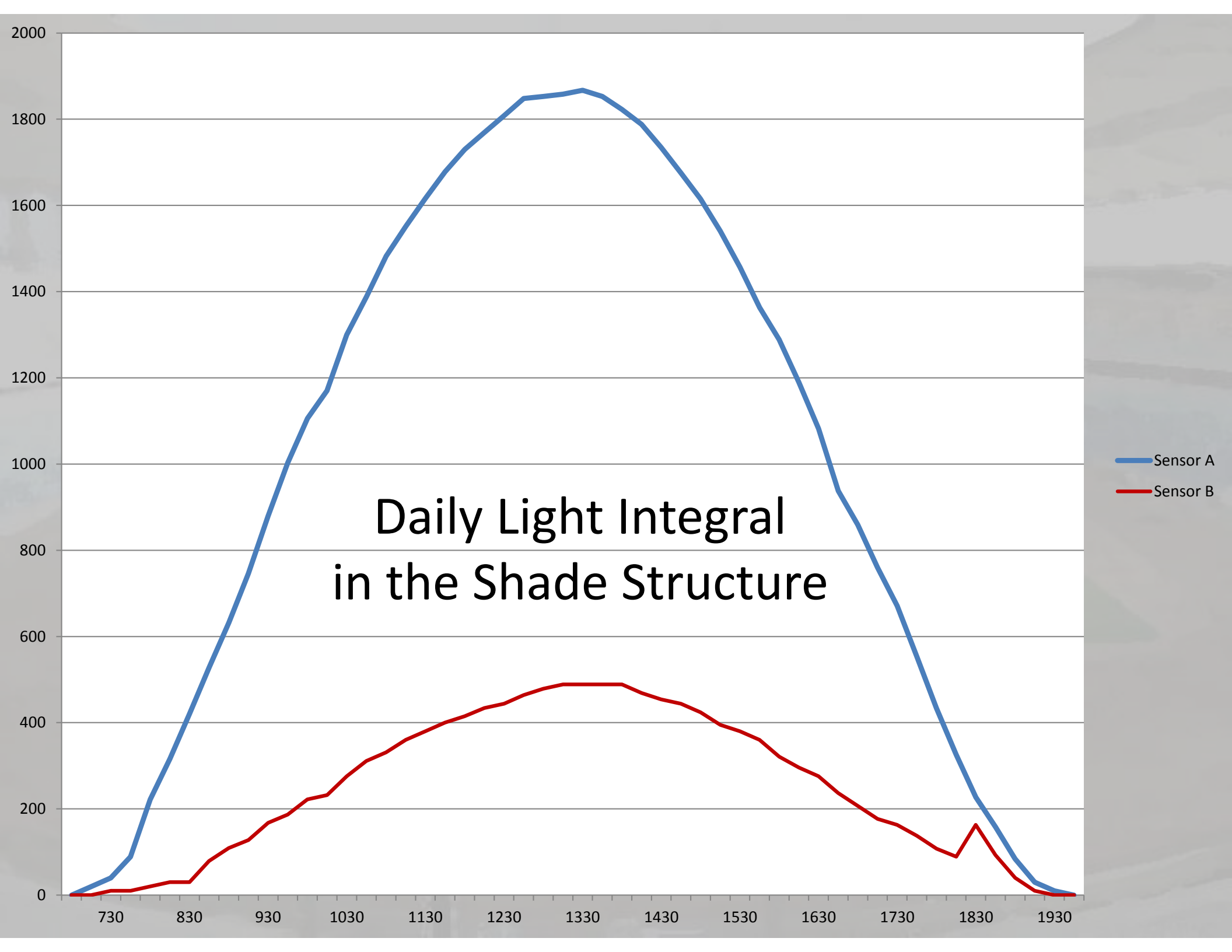


# 2014 USDA Shade Test



# Daily Light Integral in the Shade Structure

Sensor A  
Sensor B

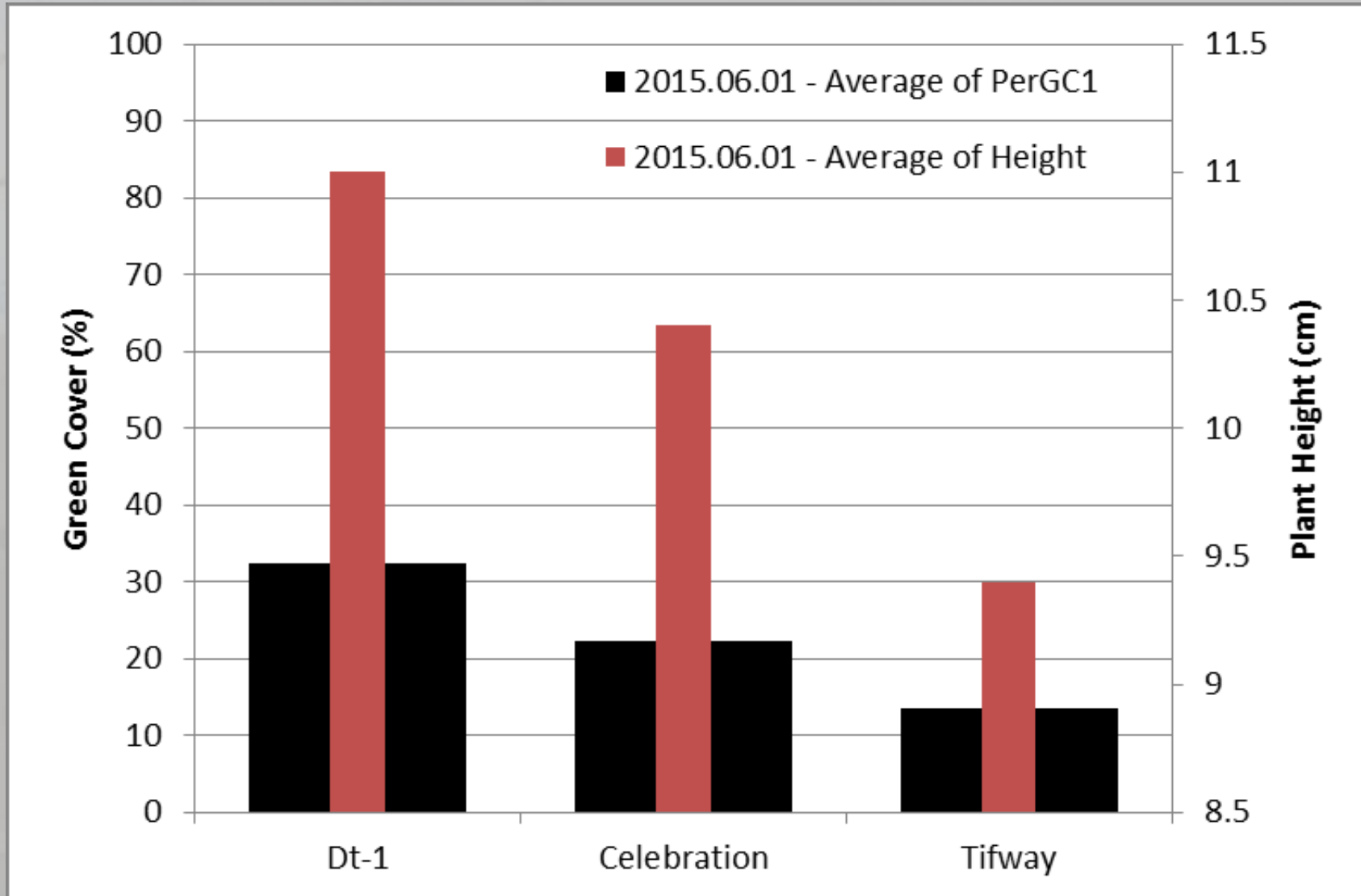




- **Bermudagrass – 2015 Tifton (June)**

# Bermudagrass Shade Trial

2015 Tifton (June)



# UGA – Offsite Trials

A photograph of a lawn in Jacksonville, FL, during 2014. The lawn is green and well-maintained, with several young trees planted in a grid pattern. The trees are supported by stakes and have blue tags. In the background, there is a body of water and a wooden fence on the right. The scene is surrounded by lush greenery, including palm trees and other plants.

- Jacksonville, FL lawn during 2014



# UGA – Offsite Trials

- **Austin, TX lawn during 2015**

An aerial photograph of a golf course. A prominent red line runs diagonally from the top center towards the bottom right, separating two distinct areas of grass. The area to the left of the red line is a vibrant green, while the area to the right is a much lighter, yellowish-green, indicating a significant difference in grass health or water stress. A semi-transparent white box is overlaid at the top, and another semi-transparent white box is overlaid at the bottom, both containing text.

# 2015 Georgia Drought

**Because DT-1 maintains acceptable quality longer than Tifway during a drought, fewer irrigation “events” will be needed, resulting in greater water savings over time**

# TifTuf Bermuda (DT-1)

- Superior hybrid cross from (4x) by (2x) parents which has been tested for over 22 years
- More **drought tolerant** than Tifway, Celebration, TifGrand, and Latitude 36
- Better establishment and cover than Tifway
- Superior traffic tolerance than Tifway or Celebration
- Higher sod strength than Tifway in the Spring and Fall
- Faster Spring green-up than Tifway and Celebration
- Greater color retention than Tifway and Celebration during the onset of fall/winter dormancy