



## TWO YEAR STUDY OF SHADE TOLERANCE OF 42 BERMUDAGRASS CULTIVARS

### Objective:

- Determine how 64 percent continuous shade impacted 42 bermudagrass cultivars' growth and development
- Two-year greenhouse study conducted from June 15, 2005 to August 15, 2005 and repeated in 2006

### Evaluations:

- Turfgrass quality (TQ) ratings after 4 weeks in both full sun and 64% continuous shade
- Turfgrass quality (TQ) ratings after 8 weeks in both full sun and 64% continuous shade
- Total shoot chlorophyll concentration after 4 weeks in both full sun and 64% continuous shade
- Total shoot chlorophyll concentration after 8 weeks in both full sun and 64% continuous shade
- Root biomass in both full sun and 64% continuous shade
- Root length in both full sun and 64% continuous shade
  - ❖ **Total of 12 comparative evaluation rankings possible for all 42 cultivars**

### Results:

- When isolating 2 of 42 cultivars, specifically TifGrand Certified Bermuda and Celebration Common Bermuda, in 8 of the 12 evaluation categories, TifGrand Certified Bermuda received a higher rankings, by Clemson, than Celebration Common Bermuda
- **TifGrand Certified Bermuda ranked higher for Shade Tolerance, by Clemson, than Celebration Common Bermuda after 8 weeks in 64% continuous shade**
- Where TifGrand Certified Bermuda received a higher ranking in an evaluation category: highlighted in TURQUISE
- Where Celebration Common Bermuda received a higher ranking in an evaluation category: highlighted in YELLOW

TEST	CULTIVAR	RANKING
Turfgrass Quality (TQ) Ranking <b>Week 4 in Full-Sun</b>	TifGrand Certified Bermuda	7.3
	Celebration Common Bermuda	7.5
Turfgrass Quality (TQ) Ranking <b>Week 4 in 64% Continuous Shade</b>	TifGrand Certified Bermuda	6.2
	Celebration Common Bermuda	6.5
Turfgrass Quality (TQ) Ranking <b>Week 8 in Full-Sun</b>	TifGrand Certified Bermuda	7.8
	Celebration Common Bermuda	7.3
Turfgrass Quality (TQ) Ranking <b>Week 8 in 64% Continuous Shade</b>	TifGrand Certified Bermuda	4.8
	Celebration Common Bermuda	4.5

Total Shoot Chlorophyll <b>Week 4 in Full-Sun</b>	TifGrand Certified Bermuda	2.39
	Celebration Common Bermuda	1.78
Total Shoot Chlorophyll <b>Week 4 in 64% Continuous Shade</b>	TifGrand Certified Bermuda	2.47
	Celebration Common Bermuda	2.08
Total Shoot Chlorophyll <b>Week 8 in Full-Sun</b>	TifGrand Certified Bermuda	3.19
	Celebration Common Bermuda	2.64
Total Shoot Chlorophyll <b>Week 8 in 64% Continuous Shade</b>	TifGrand Certified Bermuda	2.77
	Celebration Common Bermuda	2.24
Root Biomass <b>In Full-Sun</b>	TifGrand Certified Bermuda	0.127
	Celebration Common Bermuda	0.201
Root Biomass <b>In 64% Continuous Shade</b>	TifGrand Certified Bermuda	0.049
	Celebration Common Bermuda	0.064
Root Length <b>In Full-Sun</b>	TifGrand Certified Bermuda	9.23
	Celebration Common Bermuda	8.78
Root Length <b>In 64% Continuous Shade</b>	TifGrand Certified Bermuda	8.72
	Celebration Common Bermuda	7.00

***\*Highest Ranking: TifGrand Certified Bermuda 8 – Celebration Common Bermuda 4***

**Additional Considerations Concerning Root Biomass:**

- Common bermudagrass cultivars, like Celebration will have more large rhizomes which have weight but do not contribute to water and nutrient uptake
- Fine roots are what do the work, in terms of water and nutrient uptake and therefore image analysis methods for determining total root length which measures the total length of the fine and coarse roots might be considered as part of future evaluation protocol

***\*Additional considerations listed above are not part of the Clemson shade tolerance study conclusions.***