



North Carolina State University Study

Summary

- **Eight Bermudagrass cultivars were evaluated for numerous performance characteristics**
- **Cultivars evaluated included: Navy Blue, GN1, Tifton 10, Quickstand, Celebration, Patriot, Tifway and Tifsport**

Results

- **Celebration Rated #1 for Wear**
- **Celebration was among the top rated cultivars for Overall Turf Quality**

What's New with Bermudagrass?

By James M. Rutledge and Dr. Charles H. Peacock, Department of Crop Science, North Carolina State University

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Bermudagrass has long been a popular turfgrass choice in North Carolina's Piedmont and coastal-plain regions. Its tremendous vigor and dense canopy make it a natural fit for uses on athletic fields, golf-course fairways and home lawns. In recent years, a number of new cultivars have been introduced into the market, including Navy Blue, GN-1, Tifton 10, Quickstand, Celebration and Patriot. A question that often arises is which of these is most optimally adapted for a particular turf situation?

A study that began in 2001 and is still ongoing under the direction of Dr. Charles Peacock at North Carolina State University has focused directly on this question. The study includes the newer cultivars listed above as well as Tifway and TifSport. Tifway and TifSport are two slightly older cultivars that are known to exhibit excellent performance.

Eight bermudagrass cultivars have been evaluated for numerous performance characteristics that will prove helpful to turf managers when choosing a cultivar. These parameters include:

- Establishment rate
- Fall-color retention
- Salinity tolerance
- Disease incidence
- Low-temperature stress tolerance
- Nitrogen fertility requirement
- Drought-stress tolerance
- Wear tolerance
- Mowing-height differential
- Rate of lateral spread
- Overall turf quality

Trial Results thus far

Low-temperature stress tolerance

In North Carolina, low-temperature stress tolerance is one of a bermudagrass cultivar's most important characteristics. Cold winters push all bermudagrass cultivars to their lower limits of tolerance on a yearly basis, often resulting in winterkill, and thus emphasizing the importance of cultivar selection.

In low-temperature stress treatments in 2003 and 2004, plugs (2" in diameter and 2" deep) were removed from the field and exposed to various low-temperature stress treatments. In both years, data were similar: all eight cultivars survived a 30.2° F (-1° C) treatment exposure, with Patriot performing significantly better than the others. A 19.4° F (-7° C) treatment exposure resulted in Patriot, Quickstand, Navy Blue and Tifton 10 all surviving, but with Patriot and Quickstand significantly outperforming Navy Blue and Tifton 10.

In addition to the field-plug trial, we also conducted a stolon trial during the same time period. Temperature exposure in the stolon trial included treatments of 37.4° F (+3° C) control, 28.4° F (-2° C), 24.8° F (-4° C), 21.2° F (-6° C), 17.6° F (-8° C) and 14° F (-10° C). The greatest cultivar separation was observed between the temperatures of 21.2° F and 17.6° F. Similarly to the field-plug study, the five cultivars that survived the stolon trial were Patriot, Quickstand, Navy Blue, Tifton 10 and GN-1. Quickstand, Navy Blue and Patriot had the greatest survival, followed by GN-

1 and Tifton 10. With two years of data and multiple trials, it can confidently be stated that Patriot and Quickstand are the most cold-tolerant cultivars, followed closely by Navy Blue.

Overall turf quality performance

When selecting a turfgrass cultivar, overall turf quality is a primary performance characteristic that is taken into consideration. Turf quality ratings were recorded biweekly throughout the growing season to reflect performance differences among cultivars. The ratings are based on visual ratings on a scale of 1 to 9, with 1 being the poorest rating and 9 being the best. Turf quality ratings take into account a combination of characteristics such as texture, density, color and other traits that contribute to the overall appearance of the turfgrass.

Keeping this in mind, TifSport, Celebration, Patriot and Tifway performed equally well, above other cultivars. These cultivars had a higher mean turf-quality rating averaged over the entire 2004 growing season than did Tifton 10, Quickstand, GN-1 and Navy Blue.

Wear tolerance

Wear tolerance is an important issue when looking at any turfgrass and typically even more so when selecting a bermudagrass cultivar, simply by the nature of bermuda’s primary uses in high traffic areas. Bermudagrass is well adapted to handle traffic and, most importantly, to recover quickly from wear damage. However, it was found by the study that not all bermudagrass cultivars hold up equally well under this stress.

Celebration and TifSport led the way, followed closely by Tifway and Patriot by having the highest average turf-quality ratings at the end of the trial. Although TifSport is known to have a relatively slow establishment rate, its ability to withstand the applied stress with very minimal tissue damage proved to be a greater asset than the ability to recover quickly after damage was incurred.

Using this information to your advantage

Classifying cultivars based on all criteria in the trial and selecting one as the “best” can be misleading. It is important to look at each cultivar on an individual basis in order to select the cultivar that is best suited for your specific needs. The specific application of the turfgrass, management capabilities of the facility and specific environmental factors in the localized area must be considered in the selection process. The best cultivar can be chosen by adapting the facets of this study that are most applicable to your specific situation.

This important NC Turfgrass Foundation-funded project is now in its fourth year. One more growing season is needed to complete the wear-tolerance and wear-recovery data. Up-to-date information related to the NCSU bermudagrass trials can be accessed at www.turffiles.ncsu.edu by clicking on the “Publications” link, followed by clicking on the “Cultivar Trials” link.

Cultivar	Recovery (%)	
	-1C	-7C
Patriot	100	28a
GN-1	100	0c
TifSport	100	0c
Quickstand	90	22a
Celebration	90	0c
Tifway	87	0c
Navy Blue	72	5b
Tifton	59	1b

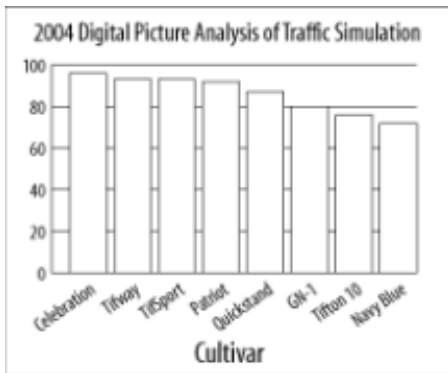
*Means within columns followed by the same letters are not significantly different at the 5% level using Waller-Duncan k-ratio t test.

Table 1: Field Plug Recovery Data

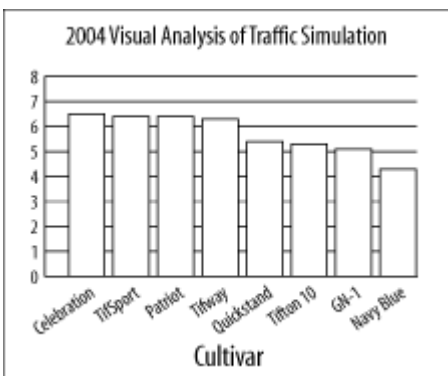
Cultivar	Recovery (%)				
	3C	-2C	-4C	-6C	-8C
Quickstand	95 a	95 a	90 a	97 a	35 a
Tifton 10	92 a	92 a	77 ab	62 ab	2 d
Tifsport	95 a	95 a	80 ab	55 b	0 d
Tifway	95 a	95 a	80 ab	52 bc	0 d
Navy Blue	75 b	82 ab	80 ab	52 bc	27 ab
Patriot	90 a	95 a	90 a	22 bc	17 bc
Celebration	85 ab	90 a	55 b	35 bc	0 d
GN-1	85 a	70 b	57 b	12 c	7 cd

*Means within columns followed by the same letters are not significantly different at the 5% level using Waller-Duncan k-ratio t test.

Table 2: Stolon Survival Data



Digital analysis was performed using Sigma Scan software to detect the percentage of the plot that had green cover. Celebration had the greatest amount of green cover and thus resisted the wear treatments the best.



Turf quality ratings reflect the performance of each turfgrass based on a visual scale of 1 to 9.