

TURFGRASS TRENDS

TURFGRASS VARIETIES

Seeded Bermudas Gain Ground

By Michael A. Raciborski and Dave Han

In the southern United States and other areas with environments that favor warm-season grasses, bermudagrass is a popular selection for golf courses. Bermudagrass is a fast-growing, sod-forming perennial that forms a dense, uniform surface with excellent wear tolerance, quick recovery rate and good surface grip. Currently, the primary choices for high-quality bermudagrass are the vegetatively propagated cultivars such as Tifway. These do not produce viable seed and are readily available in sod or sprig form.

In recent years, many new cultivars of seeded bermudagrass have become available to the public through genetic research and plant-breeding efforts. Common bermudagrass was introduced in Yuma, Ariz., around 1900, but did not become certified as Arizona Common until 1963. During the 1980s, advancements were made with the release of

improved cultivars such as Guymon for cold tolerance and Numex Sahara for overall quality. Numex Sahara is considered the first improved seeded bermudagrass bred specifically for turfgrass use.

We tested new seeded cultivars of bermudagrass to see if they have suitable shoot density, color/quality and rate of coverage for use on golf courses.

Also during the late 1990s, great advancements were made with the introduction of Riviera and Princess. These new cultivars have shown similar quality to the vegetative hybrids. From the improved performance and promising results of these cultivars, the future is bright for development of better seeded bermudagrass varieties. A major concern with seeded cultivars is their ability to survive the winter of the establishment year. Severe winterkill is a possibility in areas with harsh winters.

Reduced cost and ease of planting are some of the benefits of using seeded cultivars rather than the vegetatively propagated cultivars. One of the primary concerns about the seeded cultivars of bermudagrass is whether they offer the same high quality characteristics, rapid recovery and growth rate as the hybrids.

We studied some of the new seeded bermudagrass cultivars during the summers of 2001 and 2002 in Auburn, Ala., and Crossville, Ala. The objective of this research is to examine whether the new seeded cultivars of bermudagrass have a suitable shoot density, color/quality and rate of coverage for use on golf courses.

Two separate experiments were established in June and August 2001 at the Auburn University Turfgrass Research Unit (AUTGRU) in Auburn, Ala. Each research area was fumigated with methyl bromide three weeks prior to seeding. Plots were seeded with six different cultivars of bermudagrass at a rate of 2 pounds per 1,000 square feet on June 6 and Aug. 16, 2001.

The six cultivars of seeded bermudagrass used were Princess, Numex Sahara, Blackjack, Sydney, Bermuda Triangle and Sultan. On June 6, Tifway was established through sodding.

IN THIS ISSUE

- **Frozen Soil Worsens Pesticide Runoff Problems** 54
- **Genetic Markers Identify Dollar Spot Resistance** 58
- **Combination Treatments for Fairy Ring Prove Effective** 62

OUR SPONSORS

Bayer Environmental Science



www.BayerProCentral.com
888-842-8020



www.AndersonsGolfProducts.com
800-225-2639



www.scottscsco.com
937-644-7270



www.textronurf.com
888-922-TURF

TABLE 1

Quality ratings of bermudagrass planted 6/6/01 for the summer of 2002 at the AU TGRU

Scale 1-9 with 9-ideal, 1-poor

Variety	July	August	September
Tifway (419)	7.8 A*	8.6 A	8.6 A
Princess	7.4 A	8.1 B	8.0 B
Bermuda Triangle	6.7 B	7.4 C	7.4 C
Numex Sahara	6.5 B	7.3 C	7.2 C
Sydney	6.4 B	7.3 C	7.3 C
Sultan	6.3 BC	7.3 C	7.3 C
Blackjack	5.9 C	7.3 C	7.3 C

*Varieties with the same letter are not significantly different based on analysis using Duncan's Test ($\alpha = 0.05$)

At the Aug. 16 planting, Tifway was sprigged at 5 bushels to 10 bushels per 1,000 square feet. Immediately after seeding, the plots were covered with a cotton row cover cloth to help retain moisture and reduce washing of seed from the plots. Immediately after germination, the covers were removed and an initial fertilizer application of greens-grade fertilizer (18-3-18 at 1 pound per 1,000 square feet) was applied. Subsequent nitrogen fertilizer applications (ammonium nitrate in a 34-0-0 ratio) were applied at a rate of 1 pound per 1,000 square feet per week until 100 percent grass coverage was achieved. After establishment, a rate of 1 pound nitrogen per 1,000 square feet per growing month was applied.

When the grass reached a height of 2 inches, it was mowed with a rotary mower at 1.5 inches to 2 inches three times a week. Irrigation and pesticide applications were made as needed during establishment and maintenance.

This test was also repeated a second year in the summer of 2002 at the Sand Mountain Substation in Crossville, Ala. Nine seeded cultivars of bermudagrass were planted at Sand Mountain on May 22 and Aug. 16, 2002. The same six seeded cultivars from above were planted, with the addition of three more: Riviera, Guymon and Yukon.

The procedure above was followed during the establishment at Sand Mountain. Instead of methyl bromide, two applications of glyphosate were applied to prepare a clean seed bed.

After germination and planting dates at both sites, shoot density was recorded once a month from two months after planting until the grass entered winter dormancy after 100 percent coverage was reached. Shoot density was also recorded for the summer following the 2001 AUTGRU planting in 2002. Shoots in three 2.25 inch-diameter plugs from each plot were counted by hand.

Starting after the plots reached 100 percent coverage, color and quality ratings were taken by visual observation once a month. As fall approached, fall color retention was noted. Winterkill and spring green-up were both evaluated in spring 2002. They will also be evaluated in the spring of 2003 for the 2002 plantings.

Results—2001

During June establishment in 2001, all of the seeded cultivars emerged at the same time and had complete coverage within six weeks of planting. In the second planting (Aug. 16) that year, the seeded cultivars emerged quicker, with complete coverage within four weeks after planting. The sprigged Tifway took nine weeks to obtain complete coverage.

Shoot density of each cultivar was evaluated three months after the June planting. Tifway and Princess had the highest shoot densities, Blackjack was slightly lower, and the rest of the cultivars were slightly less, but similar to each other. Quality was also rated during this time, and once again Tifway and Princess were superior, with Blackjack following, and then the rest of the cultivars. As fall approached color retention was noted, and no differences among all the cultivars were observed.

Results—2002

As the bermudagrass began to come out of winter dormancy, spring green-up was recorded with all of the seeded cultivars greening up at a similar rate. The vegetative cultivar Tifway was the exception to this and was completely green one month prior to the seeded cultivars.

Also after the grass came out of dormancy, winterkill was evaluated. Winterkill is a major concern the initial winter after establishment for seeded bermudagrass cultivars. The two studies revealed that an early plant date is important when establishing the variety by seed.

Tifway and Princess planted the previous June showed no signs of winterkill, while Blackjack had the highest rate at 20 percent. All other cultivars showed minimal winterkill.

Plots planted in August were more susceptible to winterkill. For the August planting date, Tifway was the only cultivar with no winterkill. Princess and Sydney showed the least amount of winterkill among the seeded cultivars with less than 10 percent.

All the other cultivars showed similar susceptibility to winterkill (25 percent to 38 percent),



Andersons
GOLF PRODUCTS

QUICK TIP

Check out The Andersons wide range of quality pre-emergent products in a variety of particle sizes to fit your needs. To learn more about us, visit www.AndersonsGolfProducts.com.

TABLE 2

Quality ratings of bermudagrass planted 5/22/02 at Sand Mountain

Scale 1-9 with 9-ideal, 1-poor

Variety	August	September	October
Princess	8.5 A*	8.0 A	8.8 A
Riviera	8.5 A	7.5 AB	8.0 B
Blackjack	8.0 AB	7.0 BC	7.5 BCD
Sultan	8.0 AB	7.0 BC	8.0 B
Numex Sahara	7.8 AB	7.0 BC	8.0 C
Bermuda Triangle	7.8 AB	7.0 BC	8.0 B
Sydney	7.5 AB	7.0 BC	7.8 BC
Guymon	7.0 B	6.5 C	7.0 D
Yukon	5.8 C	6.3 C	7.3 CD
Tifway (419)	3.8 D	4.8 D	7.3 CD

*Varieties with the same letter are not significantly different based on analysis using Duncan's Test ($\alpha = 0.05$)

with Blackjack having the most at 38 percent winterkill.

As summer approached, shoot density was also measured again. Similar to the previous year, Tifway had the greatest shoot density in the project throughout the entire summer. Princess was next and the highest among the seeded cultivars.

The remaining cultivars had significantly lower shoot density. Color and quality were also recorded during the summer of 2002 with similar results to shoot density with Tifway being superior, followed closely by Princess and then the rest of the seeded cultivars (Tables 1 & 2).

Sand Mountain—2002

Establishment at Sand Mountain took slightly longer because of heavy weed pressure. Similar results were observed as in the previous year at the AUTGRU. All of the seeded cultivars established in eight weeks, and the cultivars that established quicker had less competition from the weeds.

Most of the cultivars filled in at the same rate, but Guymon and Yukon seemed to germinate slower and not establish as quickly. Therefore, they encountered heavy weed pressure. Also, since Tifway sprigs are slow to establish, they had the greatest amount of weed infestation.

Shoot density for Sand Mountain was determined. Once they were completely established, Princess, Tifway and Riviera were all similar in

shoot density. All the other seeded cultivars were similar in their shoot densities.

Princess and Riviera showed superior quality (Table 2). Note that Tifway quality is lower than expected. From the beginning of July to the middle of August, irrigation was under repair and could not be applied. The Tifway was not fully mature when the irrigation problem happened, and this slowed growth drastically. It did obtain full coverage in September soon after the irrigation was fixed.

This research will be completed during this spring and summer. Spring green-up and winterkill will be recorded. Color and quality will also be noted throughout the summer.

The new seeded cultivars of bermudagrass are approaching the quality of the hybrids. Our research shows that the newer seeded cultivars are gaining ground, but are still not quite up to the standard of Tifway. However, the reduced cost, ease of planting and quick establishment of the new seeded bermudagrasses will make them viable options for many turfgrass managers.

In conclusion, our research shows that:

- Some seeded cultivars establish much quicker than sprigged Tifway, and this helps compensate for weed pressure.
- Slower emerging and/or covering cultivars such as Yukon, Guymon and Tifway are susceptible to heavy weed pressure.
- Blackjack suffered the greatest amount of winterkill and Princess the least among seeded cultivars. Overall, Tifway suffered the least winterkill.
- At the AU TGRU, Tifway was superior in shoot density, quality and color.
- At the AU TGRU, Princess had the highest shoot density, color and quality of all the seeded cultivars.
- At Sand Mountain, Princess and Riviera had the highest shoot density and quality of the seeded cultivars.

Raciborski is a graduate research assistant at Auburn University. Han is an assistant professor and extension specialist of turfgrass management in the department of agronomy and soils at the school.

REFERENCES

- Baltensperger, A. A. 1989. "Registration of 'Numex Sahara' bermudagrass." *Crop Science* 29:1326
- Baltensperger, A. A., and J. P. Klingenberg. 1994. "Introducing new seed-propagated F1 hybrid (2-clone synthetic) bermudagrass." *USGA Green Section Record* 32 (6) :14-19
- Taliaferro, C.M., R.M. Ahring, W.L. Richardson. 1983. Registration of 'Guymon' bermudagrass." *Crop Science* 1983 v. 23 (6) p.1219