

Common Bermudagrass Encroachment Resistance of Three Hybrid Turf Bermudagrasses

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Introduction

Utilization of improved bermudagrass (*Cynodon* species) cultivars is often confounded by inability to eradicate existing bermudagrass from the end-use site. Consequently, the newly installed variety often becomes contaminated, resulting in reduced visual and functional quality of the turf (Photo 1). A question arose as to whether 'Patriot', a rapid spreading hybrid bermudagrass, could compete better with contaminant common bermudagrass under golf course fairway conditions.

Objective

Evaluate 'Patriot', 'TifSport' and 'Tifway' hybrid bermudagrasses (*C. dactylon* X *C. transvaalensis*) for their ability to compete against 'TGS U-3' under simulated golf course fairway conditions. TGS U-3 is a local sod farm selection of common bermudagrass (*C. dactylon*) that is aggressive and has been widely utilized in the southern great plains in golf courses, lawns, grounds, sports fields and roadside right of way.



Photo 1. The stark contrast in color, texture, density and growth habit between an aggressive common bermudagrass and TifSport hybrid bermudagrasses reduces the visual quality of this turfgrass plot.

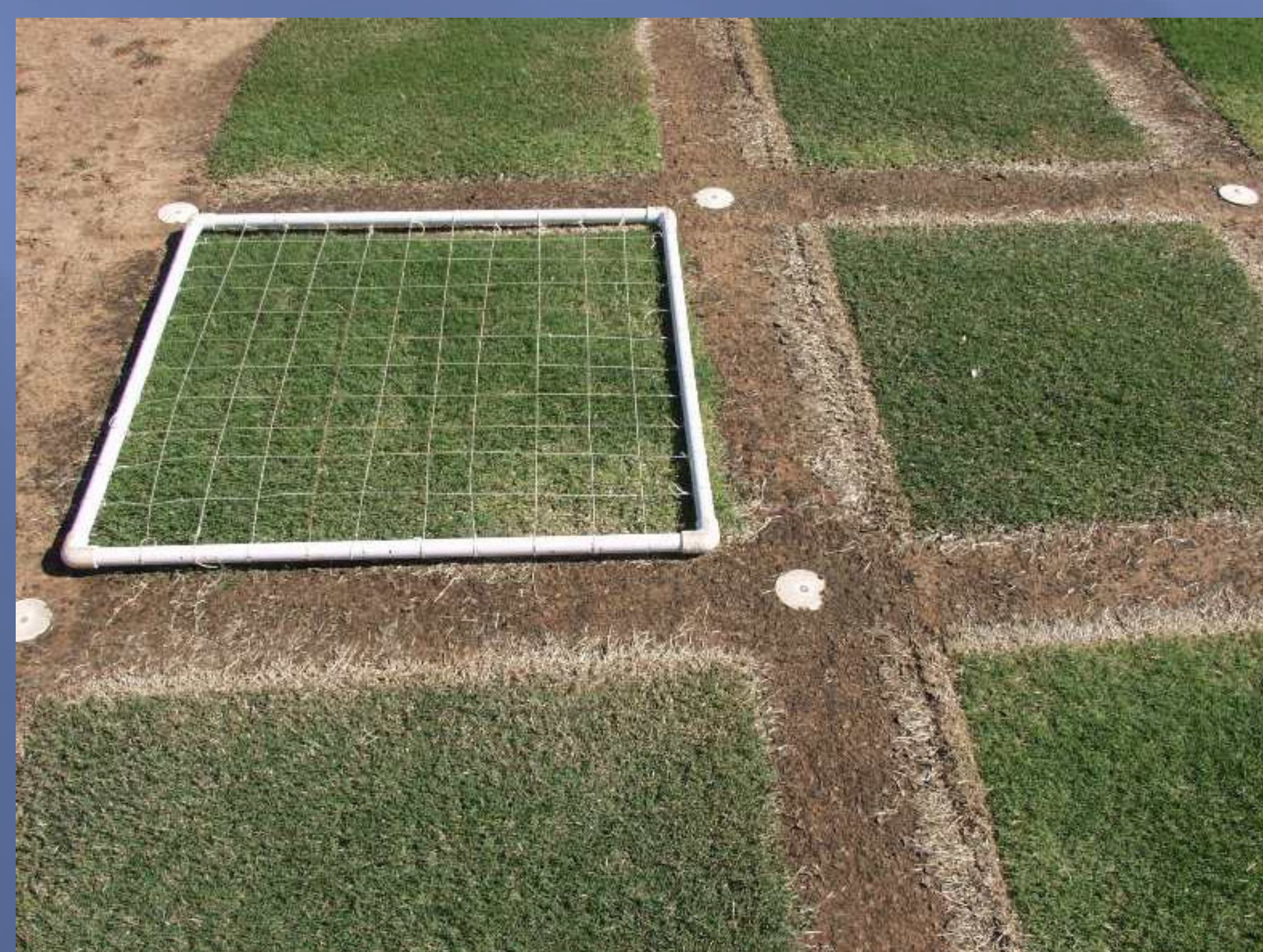


Photo 2. A 100% grid was used to assess percentage cover of each turfgrass species/variety in each experimental unit. Cover was assessed at each crossing (contact point) of string.

Materials and Methods

Research was conducted at the Oklahoma State University Turfgrass Research Center located 1.6 km west of Stillwater, OK. Three nearly identical experiments were conducted. Experiment (Exp) I was planted with sprigs of the desired turfgrass variety on June 9, 2006 with Exp II and III planted on June 12 and July 9, 2007. Sprigging was at 21 m³ ha⁻¹. Individual plot size measured 0.9 x 0.9 m. A randomized complete block design was used for all three trials with 30, 15 and 15 replications in Exp I, II and III. Newly sprigged plots of each variety were contaminated with three sprigs per plot (4 cm in length) of the contaminant TGS U-3 within 1 week of the initial planting of each experiment. This simulated failed eradication of existing common bermudagrass with a very small amount of contaminant bermudagrass remaining in place. A small loop of copper wire was placed in the soil below the contaminant for later detection with a metal detector if needed. The studies were maintained under typical golf course fairway conditions for Oklahoma. Mowing was at 1.3 cm up to 3 times per week as needed; irrigation to prevent wilting; and total season nitrogen input of 196 kg ha⁻¹ yr⁻¹.

Colonization (percent living cover) of the plot by the designated cultivar and the contaminant was visually assessed at the contact crossing points of a 100 point, 0.9 x 0.9 m assessment grid (Photo 2). Cover was measured at approximately 2, 4, and 8 weeks after sprigging in the year of establishment, with some variation in sampling frequency due to inclement weather. Two samplings were conducted for Exp I in 2007 and all three Exp were sampled once in mid-May of 2009. A separate ANOVA was conducted on percentage cover data of the desirable grasses and the contaminant cover gathered from each experiment. Highly significant rating date, cultivar, and data x cultivar interactions were found. Cultivar means within each rating date were separated with the protected LSD test at p=0.05 and means of Exp I and II are shown in Tables 1 and 2. Findings from Exp III were very similar to Exp I and are not shown due to space limitations.

Results

Dates When Significant Differences (p=0.05) in % Cover of Hybrid Bermudagrass Occurred (From 3 Experiments Totaling 12 Rating Dates During Establishment and 5 Dates in the 2 Years Following Establishment)

- Tifway NS Different than TifSport: 12 dates
- Tifway > TifSport: 5 dates (all in Exp II)
- Tifway < TifSport: 0 dates
- Patriot > TifSport & Tifway: All 17 dates
- Patriot < TifSport & Tifway: 0 date
- % Cover of all 3 hybrid cultivars increased substantially in in the 2 years following establishment.

Dates When Significant Differences (p=0.05) in % Cover of Common Bermudagrass Occurred (From 3 Experiments Totaling 12 Rating Dates During Establishment and 5 Dates in the 2 Years Following Establishment)

- Contamination in Tifway NS Different than TifSport: 12 dates
- Contamination in Tifway > in TifSport: 0 dates
- Contamination in Tifway < in TifSport: 3 dates (all in Exp II)
- Contamination in Patriot > in TifSport & Tifway: 0 dates
- Contamination in Patriot < in TifSport & Tifway: 14 dates
- Contamination in Patriot NS than in Tif Series: 3 dates (all at 2WAP)
- % Cover of the contaminant decreased substantially in all 3 hybrid cultivars in the 2 years following establishment.

Table 1. Hybrid bermudagrass and contaminant common bermudagrass cover in Experiment I. Planted 9 June 2006.

Hybrid Bermudagrass Cover						
Cultivar	26-Jun 2006 (2WAP)	14-Jul 2006 (4WAP)	31-Jul 2006 (7WAP)	6-Jun 2007 (51WAP)	11-Oct 2007 (69WAP)	14-May 2009 (152WAP)
TifSport	8.6	43.5	67.4	73.2	87.0	92.5
Patriot	51.6	94.5	99.1	99.7	99.9	99.9
Tifway	8.6	41.5	64.3	76.1	87.1	93.2
LSD (0.05)	4	6.6	6.4	7.3	5.6	3.3
Common Bermudagrass Cover						
Cultivar	26-Jun 2006 (2WAP)	14-Jul 2006 (4WAP)	31-Jul 2006 (7WAP)	6-Jun 2007 (51WAP)	11-Oct 2007 (69WAP)	14-May 2009 (152WAP)
TifSport	0.0	4.0	20.5	26.8	13.0	7.5
Patriot	0.0	0.2	0.5	0.3	0.1	0.07
Tifway	0.0	4.5	23.0	23.6	12.9	6.8
LSD (0.05)	NS	1.1	4.2	7.4	5.6	3.3

Table 2. Hybrid bermudagrass and contaminant common bermudagrass cover in Experiment II. Planted 12 June 2007.

Hybrid Bermudagrass Cover						
Cultivar	25-Jun 2007 (2WAP)	16-Jul 2007 (5WAP)	26-Jul 2007 (6WAP)	2-Aug 2007 (7WAP)	15-Aug 2007 (9WAP)	15-May 2009 (100 WAP)
TifSport	2.3	17.4	38.3	31.2	22.1	73.1
Patriot	12.6	67.3	85.0	91.1	90.3	97.6
Tifway	3.5	31.5	51.2	42.7	38.9	82.9
LSD (0.05)	4.1	9.6	9.0	8.4	7.4	4.7
Common Bermudagrass Cover						
Cultivar	25-Jun 2007 (2WAP)	16-Jul 2007 (5WAP)	26-Jul 2007 (6WAP)	2-Aug 2007 (7WAP)	15-Aug 2007 (9WAP)	15-May 2009 (100 WAP)
TifSport	1.3	10.1	22.7	48.0	74.6	26.9
Patriot	0.9	4.1	7.4	7.0	9.6	2.4
Tifway	0.9	8.5	20.4	40.3	59.5	17.1
LSD (0.05)	NS	2.5	5.0	6.2	7.6	4.7