Evaluation of Seeded and Vegetative Buffalograss Under Simulated Traffic and Nitrogen Fertility

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With decreasing fresh water resources and increasing water use restrictions on landscapes, the turf industry and general public are increasingly seeking alternative, low maintenance turfgrasses. Recently, there has been a lot of interest in using buffalograss [*Buchloe dactyloides* (Nutt.) Engelm.] on lawns and landscapes in Southern California. Buffalograss is a warm-season, stoloniferous turfgrass species native to North America. Of particular importance in areas where water availability is an issue, buffalograsses have a comparatively low water use rate. As importantly, buffalograsses exhibit a drought-induced dormancy survival characteristic, with certain cultivars (e.g., 'UC Verde') demonstrating a very quick recovery once water is available. Buffalograsses also perform very well with little or no mowing.

Although buffalograss does have a place in the Southern California landscape, it is important to understand its weaknesses as well as its strengths. Like other warm-season turfgrasses with lower water use requirements, buffalograss will go dormant or turn straw brown color during the colder periods of winter except perhaps in coastal environments where temperatures are moderated by the ocean. In general, buffalograss also exhibits weak sod strength, and poor tolerance to shaded conditions and traffic.

UC Verde is a vegetatively propagated buffalograss cultivar that resulted from a turfgrass improvement program at the University of California Davis and Riverside campuses. It was found that the new diploid female buffalograss cultivar exhibited superior drought tolerance, stolons of fine texture, and a competitive growth habit. Also, relative to other buffalograsses, it showed shorter winter dormancy with superior color retention, and high turf density with a rapid stolon spreading rate and short plant height that provided a low maintenance turf of good quality. Although UC Verde is well adapted to our region, it is sold as plugs only. This can be both expensive and time-consuming to establish a stand of turf.

In this experiment, we sought to compare establishment rates, traffic tolerance, and other turf quality characteristics of UC Verde and three experimental seed-propagated lines of buffalograss from the University of Nebraska [NOTE: 'NEBFG07-03' is now 'Sundancer'. These experimental lines were developed from parental materials that exhibited improved turfgrass performance and greater seed yield. All three lines are hexaploid. They have exhibited excellent heat tolerance and drought resistance characteristics in preliminary trials.

Location:	UCR Turf Facility, Riverside, CA
Soil:	Hanford fine sandy loam
Experimental Design:	Randomized complete block with 3 replications
Plot Size:	12' by 12'
Treatments:	1. 'UC Verde' Buffalograss 2. Seeded Buffalograss NEBFG 07-4E 3. Seeded Buffalograss NEBFG 07-01 4. 'Sundancer' Seeded Buffalograss (formerly NEBFG07-03)
Plugs and Seed Established:	9 July 2010
Seeding Rate:	2 lbs/1000 ft^2
Plug Spacing:	18-inch spacing of UC Verde plugs
Fertility:	Once fully established in August 2011, plots were split by 2 and 4 lbs N/1000 ft^2/Yr
Traffic:	In perpendicular direction, plots split by traffic simulation - two passes twice/week using Brinkman Traffic Simulator beginning in August 2011 and June 2012
Mowing Height:	2 inches
Irrigation Regimes:	Established for 8 weeks at 160% ET_o replacement, then irrigation was lowered to warm season historical crop coefficient values (ET_o*K_c)/DU
Data Collection:	turf quality, percent brown canopy tissue cover, color quality, percent cover, winter color retention, spring green up, response to simulated traffic
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Preliminary Results:

- ✓ Data shown in Tables 1-4 were combined across all N fertility and traffic levels for ease of presentation and based upon statistical analyses.

- ✓ UC Verde retained its color longer in the fall season compared to the seeded types (Table 1). However, in spring 2011, seeded types tended to green-up faster than UC Verde (data not shown).

- ✓ Higher N fertility increased quality of both trafficked and un-trafficked buffalograss (data not shown).

- ✓ In 2011, traffic was detrimental to all types of buffalograss reducing turf quality to below acceptable industry standards. However, UC Verde buffalograss held its integrity much longer than the seeded buffalograss varieties. This is mostly likely related to the increased density of the vegetative cultivar. Traffic was less detrimental to all buffalograsses in 2012, a likely result of the maturation of the turf.

- ✓ Overall, higher nitrogen fertility increased turf cover in trafficked plots, and in 2011 it decreased percent straw cover (data not shown). Higher N levels decreased percent straw cover and increased turf cover when traffic was applied.

- ✓ Overall, trafficked UC Verde buffalograss was similar to un-trafficked seeded varieties in terms of percent turf cover (data not shown).

- ✓ In general, UC Verde provided a denser, higher quality turf compared to the seeded types allowing it to support traffic for longer periods of time with less damage to the turf.

- ✓ The seeded buffalograss cultivars offer a darker color quality than UC Verde (depending on N fertility), but produce unsightly seed heads during spring and summer months.

- ✓ Thus far, we have not seen a lot of separation in turf performance and quality among the three seeded types under evaluation. However, they appear to be a viable option for Southern Californians who wish to establish buffalograss from seed instead of vegetatively.

Table 1. Overall quality (across all fertility and traffic levels) of buffalograsses in 2011. Traffic treatments were initiated in August. Riverside, CA.

	Turf Quality (1-9; 1 = brown/dormant, 6 = minimally acceptable				
Cultivar	August	September	October	November	December
UC Verde	6.6	6.3 a*	4.7 a	3.9 a	1.3 a
NEBFG 07-4E	6.5	5.7 b	4.3 ab	1.5 b	1 b
NEBFG 07-01	6.5	5.7 b	4 b	1.5 b	1 b
Sundancer	6.7	5.8 b	4.1 b	1.6 b	1 b
LSD (α = 0.05)	**ns**	**0.36**	**0.38**	**0.31**	**0.12**

*Treatment means followed by the same letter in a column are not significantly different (α = 0.05).

Table 2. Overall quality (across all fertility and traffic levels) of buffalograsses in 2012. Traffic treatments were initiated in June.

	Turf Quality (1-9; 1 = brown/dormant, 6 = minimally acceptable					
Cultivar	March	April	June	July	August	September
UC Verde	2.7	3.7	6.0 a*	5.4 b	5.2	5.8 a
NEBFG 07-4E	2.6	3.7	5.8 ab	5.5 ab	4.9	5.4 ab
NEBFG 07-01	2.7	4.0	5.7 b	5.4 b	4.8	5.3 bc
Sundancer	2.4	4.0	5.8 b	6.1 a	4.8	5.0 c
LSD (α = 0.05)	**ns**	**ns**	**0.24**	**0.66**	**ns**	**0.34**

*Treatment means followed by the same letter in a column are not significantly different (α = 0.05).

Table 3. Overall visual percent straw cover (across all fertility and traffic levels) of buffalograsses in 2011. Traffic treatments were initiated in August. Riverside, CA.

Cultivar	August	September	October	November	December
UC Verde	1	7 b*	16 b	35 b	95 b
NEBFG 07-4E	1.5	13 a	22 a	80 a	100 a
NEBFG 07-01	1	14 a	25 a	82 a	100 a
Sundancer	1.5	14 a	21 ab	82 a	100 a
LSD (α = 0.05)	**ns**	**3.8**	**5.0**	**8.1**	**1.6**

*Treatment means followed by the same letter in a column are not significantly different (α = 0.05).

Table 4. Overall visual percent straw cover (across all fertility and traffic levels) of buffalograsses in 2012. Traffic treatments were initiated in June. Riverside, CA.

Cultivar	June	July	August	September
UC Verde	6 b*	9 b	18.5	12 b
NEBFG 07-4E	7 ab	15 ab	20	16 a
NEBFG 07-01	8 a	16 a	24	18 a
Sundancer	7 ab	12 ab	18	18 a
LSD (α = 0.05)	**1.6**	**6.0**	**ns**	**2.4**

*Treatment means followed by the same letter in a column are not significantly different (α = 0.05).