'UC Verde' Buffalograss Tolerance to Herbicides

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Buffalograss has been receiving a lot of attention recently in southern California as a drought tolerant and low maintenance alternative to commonly used turfgrass species such as tall fescue. Thus, more information is needed regarding its tolerance to agrochemicals, especially herbicides. Buffalograss is not a commonly used turfgrass species, thus tolerance and use information may be lacking on herbicide labels. This study was developed to evaluate newer or soon-to-be-released herbicides on 'UC Verde', a vegetatively-propagated cultivar developed by the University of California that is well adapted to southern California.

Location:	UCR Turf Facility
Soil:	Hanford fine sandy loam
Experimental Design:	Completely randomized design with 4 replications
Plot Size:	4' by 6'
Species/Cultivars:	Mature stand of 'UC Verde' buffalograss established from plugs in July 2010
Application Information:	CO_2 backpack sprayer TeeJet 8002VS nozzles 9-inch nozzle spacing 12-inch boom height Speed 2.4 mph Output: 40 GPA Pressure: 20 psi @ ank
Application Timing:	A: 12 July 2011 B: 1 September 2011
Fertility:	4.0 lbs N/1000 ft^2/year
Mowing Height:	2 inches

Irrigation Regimes: Warm-season historic K_c : $(ET_o * K_c)/DU$

Data Collection: Total plot turf quality, percent weed tissue cover by species, and NDVI.

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Results:

- ✓ Weed pressure was sporadic, therefore the focus of this study was on buffalograss tolerance to the herbicides.
- ✓ In general, all of the herbicides tested exhibited some degree of safety on UC Verde, ranging from excellent to injury at high or exaggerated rates. High rates of amicarbazone and Imprelis caused the most significant injury; however, turf eventually recovered. Application(s) of either herbicide at 3 oz/A or less would be advised from the standpoint of buffalograss safety.
- ✓ Application of the higher rate of Tenacity resulted in bleaching of buffalograss leaves within 1-2 weeks after application. This symptom is characteristic of the mode of action, and was short-lived.
- ✓ Turf injury may have resulted, in part, to high daytime temperatures around the time of applications in July and September. Hence, this study could be considered as a worse case scenario in terms of evaluating herbicides for potential buffalograss injury.

Buffalograss Herbicide Tolerance Plot Map

Plot Size: 4 ft x 6 ft

North

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	17	21	23
9	17	13	6	19	7	10	4	2	21	18	15	16
17	7	12	1	9	14	4	3	21	11	23	5	22
15	5	3	12	4	7	6	11	9	15	6	22	20
10	13	18	10	13	2	16	1	12	8	20	1	18
14	2	20	5	8	11	14	8	19	3	22	19	16

Table 1. Buffalograss quality (1-9, 9 = best) following application of herbicides. Riverside, CA.

Trt	Product	Rate	7 DAIT	14 DAIT	28 DAIT	49 DAIT	58 DAIT
1	Control	--	6.0 a	6.0 a	6.0 ab	6.8 ab	7.0 a
2	Amicarbazone	3 oz/A	6.0 a	6.0 a	6.0 ab	6.8 ab	7.0 a
3	Amicarbazone	6 oz/A	5.0 b	4.8 b	5.2 cd	6.8 ab	6.5 abc
4	Amicarbazone[a]	9 oz/A	4.2 c	3.0 cd	5.0 de	6.0 a-d	7.0 a
5	Methiozolin	2.8 oz/M	6.0 a	5.8 a	6.0 ab	6.2 a-d	6.0 cd
6	Methiozolin	4.2 oz/M	6.0 a	5.8 a	6.0 ab	6.8 ab	6.5 abc
7 7	Tower Pendulum AC	32 oz/A 48 oz/A	6.0 a	6.0 a	6.0 ab	6.0 a-d	6.8 ab
8	Katana	3 oz/A	5.8 a	5.8 a	6.0 ab	7.0 a	6.8 ab
9	Tower	21 oz/A	6.0 a	6.0 a	6.0 ab	6.8 ab	7.0 a
10	Tower[b]	21 oz/A	5.8 a	5.8 a	5.2 cd	5.2 b-e	6.8 ab
11	Tower	32 oz/A	6.0 a	6.0 a	6.0 ab	7.0 a	7.0 a
12	Tower[b]	32 oz/A	6.0 a	6.0 a	6.0 ab	6.0 a-d	6.8 ab
13	Tenacity 4SC	8 oz/A	5.8 a	6.0 a	5.8 bc	6.5 abc	6.2 abc
14	Tenacity 4SC	16 oz/A	5.2 b	6.0 a	6.0 ab	6.8 ab	4.0 h
15	Monument	10 g/A	6.0 a	6.0 a	6.0 ab	7.0 a	7.0 a
16	Monument	20 g/A	6.0 a	6.0 a	6.5 a	7.0 a	7.0 a
17 17	Tenacity 4SC Monument	8 oz/A 10 g/A	6.0 a	6.0 a	6.0 ab	6.8 ab	7.0 a
18	Imprelis	1.5 oz/A	5.0 b	5.5 a	5.8 bc	5.5 a-e	6.0 cd
19	Imprelis	3.0 oz/A	5.0 b	4.5 b	5.0 de	5.8 a-e	5.5 de
20	Imprelis	4.5 oz/A	4.0 cd	4.8 b	4.5 e	5.0 cde	4.8 fg
21	Imprelis	6.0 oz/A	3.8 d	3.2 c	3.8 f	4.8 def	4.8 fg
22	Imprelis[a]	9.0 oz/A	2.8 e	2.5 de	3.0 g	4.2 ef	5.2 ef
23	Imprelis[a]	12.0 oz/A	2.0 f	2.0 e	2.0 h	3.0 f	4.3 gh
	LSD (α = 0.05)	**--**	**0.5**	**0.6**	**0.6**	**1.7**	**0.5**

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

[a]Treatment applied only once on 12 July 2011. Other treatments repeated on 1 September 2011. DAIT = Day after initial treatment. 58 DAIT = 8 days after second application.

[b]Spray output = 80 GPA; all other treatments = 40 GPA.

Table 2. NDVI on buffalograss following application of herbicides. Riverside, CA.

Trt	Product	Rate	7 DAIT	14 DAIT	28 DAIT	49 DAIT	58 DAIT
1	Control	--	0.70 a	0.60 ab	0.59 ab	0.76	0.83 abc
2	Amicarbazone	3 oz/A	0.67 a-e	0.59 a-d	0.61 a	0.76	0.82 abc
3	Amicarbazone	6 oz/A	0.66 b-e	0.58 a-e	0.54 b-e	0.74	0.82 a-d
4	Amicarbazone[a]	9 oz/A	0.65 c-f	0.54 cde	0.54 b-e	0.73	0.84 a
5	Methiozolin	2.8 oz/M	0.68 abc	0.61 a	0.58 abc	0.74	0.82 abc
6	Methiozolin	4.2 oz/M	0.68 a-e	0.58 a-e	0.59 ab	0.76	0.82 a-d
7 7	Tower Pendulum AC	32 oz/A 48 oz/A	0.68 a-e	0.59 a-d	0.57 a-d	0.74	0.82 a-e
8	Katana	3 oz/A	0.64 efg	0.60 ab	0.61 a	0.78	0.80 cde
9	Tower	21 oz/A	0.67 a-e	0.60 ab	0.58 ab	0.76	0.82 abc
10	Tower[b]	21 oz/A	0.64 efg	0.55 b-e	0.54 b-e	0.69	0.81 b-e
11	Tower	32 oz/A	0.68 a-d	0.62 a	0.61 a	0.77	0.82 abc
12	Tower[b]	32 oz/A	0.68 abc	0.58 a-e	0.57 abc	0.73	0.82 a-d
13	Tenacity 4SC	8 oz/A	0.69 ab	0.60 abc	0.58 abc	0.75	0.82 abc
14	Tenacity 4SC	16 oz/A	0.68 a-e	0.62 a	0.57 a-d	0.75	0.77 fg
15	Monument	10 g/A	0.69 ab	0.62 a	0.59 ab	0.74	0.82 abc
16	Monument	20 g/A	0.68 abc	0.63 a	0.60 a	0.79	0.83 abc
17 17	Tenacity 4SC Monument	8 oz/A 10 g/A	0.69 abc	0.60 ab	0.56 a-d	0.76	0.84 ab
18	Imprelis	1.5 oz/A	0.64 d-g	0.58 a-e	0.57 a-d	0.70	0.82 a-e
19	Imprelis	3.0 oz/A	0.60 g	0.53 ef	0.52 de	0.72	0.79 def
20	Imprelis	4.5 oz/A	0.60 g	0.54 cde	0.53 cde	0.71	0.77 fg
21	Imprelis	6.0 oz/A	0.61 fg	0.54 de	0.51 ef	0.69	0.75 g
22	Imprelis[a]	9.0 oz/A	0.56 h	0.48 fg	0.47 fg	0.71	0.82 abc
23	Imprelis[a]	12.0 oz/A	0.54 h	0.46 g	0.42 g	0.65	0.78 ef
	LSD (α = 0.05)	**--**	**0.04**	**0.06**	**0.05**	**NS**	**0.03**

Treatment means followed by the same letter are not significantly different (α = 0.05).
NS = Not significant.

[a]Treatment applied only once on 12 July 2011. Other treatments repeated on 1 September 2011. DAIT = Day after initial treatment. 58 DAIT = 8 days after second application.
[b]Spray output = 80 GPA; all other treatments = 40 GPA

Table 3. Herbicides tested in the buffalograss tolerance study.

Product	Manufacturer	Common Name(s)	Notes
Monument	Syngenta	Trifloxysulfuron	Sulfonylurea; broadleaf and sedge control; transition herbicide
Tenacity	Syngenta	Mesotrione	Based on a naturally occurring compound secreted by the Callistemon (bottlebrush) plant. Inhibits carotenoid biosynthesis, causing bleaching. Pre and post activity in most cool-season turf except bentgrass; CA registration pending in 2012
Amicarbazone	Arysta LifeScience	Amicarbazone	New triazolinone herbicide with pre and post grass and broadleaf activity in warm- and cool-season turf; U.S. turf registration pending in 2012
Methiozolin	Moghu Research Center	Methiozolin	New isoxazolinone herbicide for pre and post control of *Poa annua* and *Poa trivialis* in most warm- and cool-season turf
Tower	BASF	Dimethenamid	Preemergence control of broadleaf, grass, and sedge weeds; CA turf registration pending in 2012
Pendulum Aqua Cap	BASF	Pendimethalin	Dinitroaniline preemergence herbicide
Imprelis	DuPont	aminocyclopyrachlor	Broad spectrum broadleaf control; CA registration pending
Katana	PBI Gordon	Flazasulfuron	Sulfonylurea; broadleaf and sedge control; transition herbicide; not currently registered in CA