

# Strategies for Converting from Cool-Season Turf to Warm-Season Turf for Water Conservation

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**Objectives:** In 2008, a pilot study was initiated to determine optimal timing and planting rate of UC Verde buffalograss plugs along with eradication method of tall fescue to achieve the most rapid conversion to buffalograss with the least amount visual discoloration.

**Location:** UCR Turf Facility

**Soil:** Hanford fine sandy loam

**Experimental Design:** Randomized complete block with 3 replications

**Plot Size:** 5' by 10'

**Species/Cultivars:** Mature stand of 'Crossfire 2' tall fescue; UC Verde buffalograss

**Application of Roundup ProMax:** 8/19/2008, 4.7 qts/A

**Application Information:** CO<sub>2</sub> Bicycle sprayer  
TeeJet 8002VS Nozzles  
19" nozzle spacing  
22" boom height  
Speed: 1 mph  
Output: 2gal/1000ft<sup>2</sup>  
Pressure: 41 psi @tank and 38 psi @handle  
Calibration of 1060 ml/nozzle/minute

**Plugs Established:** 8/29/2008

**Fertility:** 0.5 lb N/1000 ft<sup>2</sup> approximately every month

**Mowing Height:** 3 inches

**Irrigation Regimes:** Once the buffalograss overcame transplant shock, plots were to be irrigated according to buffalograss water use needs. This was not done until 2008

**Data Collection:** Buffalograss rate of establishment and cover

**Acknowledgments:** Special thanks to Florasource, Ltd. and Monsanto for donating the UC Verde buffalograss and Roundup herbicide, respectively.

North

1	2	3	4	9	8
5	6	7	10	11	12
2	10	4	6	9	11
8	12	1	7	3	5
4	6	10	8	12	1
7	9	2	11	3	5

**Treatments**

1. Roundup entire plot, plant plugs at 6" spacing
2. Roundup entire plot, plant plugs at 12" spacing
3. Roundup entire plot, plant plugs at 18" spacing
4. Remove sod, plant plugs at 12" spacing
5. Roundup 10" strips, plant plugs within at 12" spacing
6. Roundup 10" strips, plant plugs within at 12" spacing; intended to repeat procedure on adjacent living turf in June 2009 (not completed)
7. Plant plugs at 12" spacing in untreated tall fescue turf
- 8-12. Same as treatments 1-7, but intended to plant in June and August 2009 (not completed)

Table 1. Establishment rate of UC Verde buffalograss and weed encroachment during conversion from tall fescue.

Cover	% Buffalo	% Buffalo	% Buffalo	% Poa annua	% Buffalo	% Broadleaf
Treatment	10-2-2008	11-10-2008	12-4-2008	5-12- 2009	5-12- 2009	5-12-2009
1. Roundup; 6 inch spacing	57	83	90	9	92	1
2. Roundup; 12"	30	58	67	17	83	2
3. Roundup; 18"	7	18	23	22	56	6
4. Remove sod; 12"	38	55	73	2	96	3
5. Roundup strips; 12"	10	13	15	3	25	1
6. Roundup strips; 12"	10	17	18	2	28	2
7. Untreated tall fescue; 12"	5	5	6	7		
LSD (P=.05)	9.4	13.6	21	6.7	14.6	6.6
CV	23.6	21.5	27.9	41.8	12.7	151

**Results:**

- Most rapid conversion occurred by eradicating existing stand of tall fescue and planting UC Verde on 6-inch spacing.
- 12-inch spacing resulted in slower establishment, but faster than 18-inch spacing.
- Removing sod prior to plugging did not provide an advantage for establishment of buffalograss compared to treatment with Roundup.
- Plugging UC Verde into living tall fescue turf is not advised.

Table 2. Effects of Revolver (foramsulfuron) herbicide applied on 8-11-09 on UC Verde buffalograss tolerance and control of tall fescue and weeds.

Description	Turf Injury (1-9,1=worst)	Turf Quality (1-9,9= best)	% Leaf Fire (0-100)	% Spurge Control (0-100)	% Dandelion Control (0-100)	Turf Quality (1-9, 9 = best)	% Leaf Fire (0- 100)
Treatment	8-19-2008	8-26-2009			9-09-2009		
1. Revolver 18oz/Acre	7	7	12			7	7
2. Untreated	7	7	17			7	13
3. Revolver 26oz/Acre	7	7	18			7	8
4. Untreated	6	6	6			7	12
5. Untreated	7	7	7			7	28
6. Revolver 26oz/Acre	7	7	7			6	90
7. Revolver 26oz/Acre	4	3	57			2	88
8. Revolver 26oz/Acre	7	5	23	20	40	2	90
9. Untreated	7	7	2	0	30	7	1
10. Revolver 18oz/Acre	5	3	57			2	87
11. Revolver 26oz/Acre	5	4	38			2	88
12. Untreated	5	5	38			6	32
LSD (P=.05)	1.9	1.9	30.4	NS	NS	1.2	26.7
CV	18.4	20.1	76.7			14	34.5

**Results:**

- Revolver caused only slight and short term discoloration on UC Verde buffalograss at both application rates and would serve as a good choice for selective removal of tall fescue and several weed species during conversio

On August 11, 2009, a second study was initiated to evaluate safety of Revolver (foramsulfuron) herbicide on UC Verde buffalograss and efficacy against tall fescue and weeds. Revolver was applied at 18 oz product/A on treatments 1 and 10 listed above, and 26 oz product/A on treatments 3, 6, 7, 8, and 11. Methylated seed oil was added to the tank at 0.5% v/v. The remaining treatments were untreated.

In 2009, a second turf conversion study was initiated at the UCR Turfgrass Research Center in Riverside and at the South Coast Field Station in Irvine.

### **Objectives**

1. Investigate the most efficient and effective method(s) for converting turf from cool-season to warm-season species, thereby significantly reducing water use.
2. Compare five warm-season species and two establishment methods (seeding vs. plugging) in inland and coastal climates in southern California.
3. Evaluate use of a colorant in addition to mowing and fertility practices to offset or delay turf discoloration during conversion and dormancy.
4. Determine effects of establishment method on weed encroachment followed by best methods of weed eradication.

### **Study Locations**

1. UCR Turfgrass Research Facility, Riverside
2. South Coast Research Field Station, Irvine

### **Existing Study Conditions**

1. Mature tall fescue turf maintained under lawn conditions
2. Mowed 1-2 times/week at 2 inches using a rotary mower
3. Irrigated at  $\geq 80\%$  ET to maintain green color
4. 4+ lbs N/1000 ft<sup>2</sup>/yr

### **Conversion Methods Prior to Planting**

1. Apply nonselective herbicide (Roundup Pro Max) to eradicate tall fescue
2. Scalp tall fescue turf down to lowest height adjustment on rotary mower
3. Leave tall fescue as is

### **Turfgrass Species and Establishment Methods**

1. 'Tifsport' hybrid bermudagrass plugs (chosen because of fall color retention and less aggressive growth habit)
2. 'DeAnza' zoysiagrass plugs (UCR release chosen because of fall color retention)
3. 'UC Verde' buffalograss plugs (UC release chosen because of exceptional drought resistance)
4. 'Palmetto' St. Augustinegrass plugs (species chosen because of shade tolerance)
5. 'Sea Spray' seashore paspalum plugs (species chosen because of exceptional salt tolerance)
6. 'NuMex Sahara' bermudagrass seed
7. 'Sea Spray' seashore paspalum seed

1.25-inch diameter plugs planted on 12-inch spacing

Seeding rate: 1 lb pure live seed/1000 ft<sup>2</sup> broadcast after solid tine aeration

## **Turfgrass Colorant**

1. Half of each plot will be treated with Greenlawnger colorant every 3-5 weeks to help mask discoloration due to conversion practices and winter dormancy.

## **Study Conditions After Conversion**

1. Syringed lightly 5 times/day for 3 weeks following planting.
2. Reduced irrigation to 60% ET<sub>o</sub> to favor warm-season grasses
3. Mow scalped and Roundup plots 1-2 times/wk at 1.5 inches using a reel mower
4. Mow remaining plots 1-2 times/week at 2.5 inches using a rotary mower
5. 4 lbs N/1000 ft<sup>2</sup>/yr with rates and frequency designed to optimize winter color retention based on previous research
6. Weed control as needed to maintain uniformity
7. Possible use of a selective herbicide like Revolver that will eradicate tall fescue and weeds from the stand of warm-season turf

## **Experimental Design**

1. Completely randomized split (turf colorant) block with 3 replications per study location
2. 7 species/establishment methods x 3 conversion methods x 3 replications = 63 plots
3. Main plots: 7 ft x 7 ft; sub-plots 3.5 ft x 7 ft
4. 3,087 ft<sup>2</sup> study area/location

## **Ratings (monthly or as needed)**

1. Warm-season turf cover (using 12-inch grid )
2. Turf quality
3. Turf color
4. Fall/winter color retention/spring greenup
5. Weed encroachment

## **Study Timeline**

1. UCR study was planted on June 19, 2009 and South Coast study on July 15,2009

## **Acknowledgments**

Special thanks to West Coast Turf and Florasource, Ltd. for donations of plant materials, and to Monsanto , Target Specialty Products, and Becker Underwood for donating chemicals.

## Turf Conversion Study Plot Map

North

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

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

South

O= Controller

- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. No Removal, Tifsport Bermuda</li> <li>2. No Removal, De Anza Zoysia</li> <li>3. No Removal, UC Verde Buffalo</li> <li>4. No Removal, Palmetto St. Augustine</li> <li>5. No Removal, Sea Isle 1Seashore Paspalum</li> <li>6. No Removal, Princess 77 Bermuda Seed</li> <li>7. No Removal, Sea Spray Seashore Paspalum Seed</li> <li>8. Scalp, Tifsport</li> <li>9. Scalp, De Anza</li> <li>10. Scalp, UC Verde</li> <li>11. Scalp, Palmetto</li> </ol> | <ol style="list-style-type: none"> <li>12. Scalp, Sea Isle 1</li> <li>13. Scalp, Princess 77 Seed</li> <li>14. Scalp, Sea Spray Seed</li> <li>15. Round Up, Tifsport</li> <li>16. Round Up, De Anza</li> <li>17. Round Up, UC Verde</li> <li>18. Round Up, Palmetto</li> <li>19. Round Up, Sea Isle 1</li> <li>20. Round Up, Princess 77 Seed</li> <li>21. Round Up, Sea Spray Seed</li> </ol> |
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