

## **STOP #4c: Drought Tolerant Seeded Cool-Season Turfgrasses for Southern California**

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### Objectives

Identify species/cultivars with improved tolerance to drought/heat stress. This is an important approach toward sustainability of turfgrasses in the California landscape amidst declining water resources and increasing water use restrictions on lawns and landscapes. Seeded turfgrasses provide a cheaper alternative to more expensive sodding.

### Material and Methods

- a. Entries (following pages) were seeded on 10 May 2013.
- b. 4.0 lbs N/M and non-limiting irrigation during establishment.
- c. Plots mowed weekly at 2 and 4 inches since July 2013.
- d. On August 15 2013 irrigation was turned off. Plots were then watered by hand 3X weekly to replace 50% CIMIS ETo until the end of October. During fall and winter irrigation was restored at 100%. On May 30 2014 irrigation was turned off. Plots were then watered by hand 3X weekly to replace 60% CIMIS ETo.
- e. Plots rated every two weeks for drought stress (1-9 scale, 9 = best) and digital image analysis

### Results

Higher mowing height caused reduction in turf quality only during the first month of the study. Subsequently no differences in quality were found when grass was mowed at 4 inches.

During the first year, tall fescues PPGTF105, PPGTF142, PPGTF145 and PPGTF156 and Delta Bolero Mix achieved the highest quality and percent green cover. Pearl's Premium showed the highest Dark Green Color Index (DGCI). Conversely, the lowest ratings were collected on bentgrass plots. On Aug 25, and consistently with the other rating dates, no grasses achieved an acceptable quality of 6. However, PPGTF105 and PPGTF142 tall fescues performed better than the other grasses achieving higher quality and percent green cover. Conversely, both bentgrass plots (Delta Native Bentgrass and Stover Native Bentgrass) had the poorest quality and cover, revealing poor adaptability to inland hot, desert environments such as Riverside (Table 1).


### UCR Lawn/Native Grass Deficit Irrigation Study


No.	Product/Species/Variety	Company	Seeding Rate lbs/1000 ft <sup>2</sup>
1	Delta Native Bentgrass ➤ <i>Agrostis pallens</i>	Delta Bluegrass Company	1.5
2	Delta Native Mow Free Mix ➤ <i>Festuca rubra</i> Molate 40% - Red Fescue ➤ <i>Festuca occidentalis</i> 30% - Western Fescue ➤ <i>Festuca idahoensis</i> 30% - Idaho Fescue	Delta Bluegrass Company	3.0
3	Delta Native Biofiltration Mix ➤ <i>Stipa pulchra</i> - Purple Needlegrass ➤ <i>Festuca rubra</i> Molate - Red Fescue ➤ <i>Hordeum californicum</i> - California barley ➤ <i>Hordeum brachyantherum</i> - Meadow barley	Delta Bluegrass Company	3.0
4	Delta Bolero Plus Mix 90/10	Delta Bluegrass Company	5.0
5	Delta 90/10 Fescue/Blue Mix	Delta Bluegrass Company	5.0
6	MVS Tall Fescue ➤ Spyder LS	Mountain View Seeds	5.0
7	MVS Tall Fescue ➤ PPG-TF105	Mountain View Seeds	5.0
8	MVS Tall Fescue ➤ Titanium LS	Mountain View Seeds	5.0
9	MVS Tall Fescue ➤ PPG-TF142	Mountain View Seeds	3.0
10	MVS Tall Fescue ➤ PPG-TF156	Mountain View Seeds	3.0
11	MVS Tall Fescue ➤ PPG-TF145	Mountain View Seeds	3.0
12	Stover Native All- Purpose Mix ➤ <i>Bromus carinatus</i> 20% ➤ <i>Nassella (Stipa) pulchra</i> 31% ➤ <i>Festuca rubra</i> Molate 31% ➤ <i>Deschampsia cespitosa</i> var <i>Holciformis</i> 8% ➤ <i>Agrostis pallens (Diegosensis)</i> 6% ➤ <i>Koeleria macrantha</i> 4%	STOVER Seed Company	1.12
13	Stover Native Fine Fescue Mix ➤ <i>Festuca rubra</i> Molate 37% ➤ <i>Festuca occidentalis</i> 37% ➤ <i>Koeleria macrantha</i> 11% ➤ <i>Deschampsia cespitosa</i> var <i>Holciformis</i> 15%	STOVER Seed Company	0.62
14	Stover Native Bentgrass ➤ <i>Agrostis pallens (Diegosensis)</i> Siskiyou thingrass	STOVER Seed Company	0.69

No.	Product/Species/Variety	Company	Seeding Rate lbs/1000 ft <sup>2</sup>
15	Cutting Edge Sun & Shade Mix ➤ Tall Fescue 19.8% ➤ Chewings Fescue 19.8% ➤ Hard Fescue 19.7% ➤ Kentucky Bluegrass 19.4% ➤ Perennial Ryegrass 19.4%	Cutting Edge	5.0
16	Pearl's Premium Ultra Low Maintenance Lawn Seed - Sunny Mix ➤ 'Dakota' Tall Fescue 19.75% ➤ 'Frontier' P. Rye 19.75% ➤ 'Deepblue' Kentucky Bluegrass 19.65% ➤ 'Harpoon' Hard Fescue 19.65% ➤ 'Carmen' Chewings Fescue 19.65%	Pearl's Premium	5.0
17	New Millennia Dwarf Fescue Blend ➤ '2 <sup>nd</sup> Millennium' Tall Fescue ➤ 'Focus' Tall Fescue ➤ 'Avenger' Tall Fescue	STOVER Seed Company	5.0

17	6	4	14	16
8	7	5	2	12
4	7	12	6	7
6	14	11	12	5
1	11	3	15	17
16	16	10	13	10
9	13	8	3	1
3	2	1	10	15
14	15	5	9	8
2	4	9	11	13

North →

 4-inch mowing height

 2-inch mowing height

**Table 1. Lawn/Native grasses quality, cover (%) and Dark Green Color Index (DGCI) on Sep 26 2013.**

<b>Product/Species/Variety</b>	<b>Quality</b>	<b>Cover (%)</b>	<b>DGCI</b>
Cutting Edge Sun and Shade Mix	4.3 AB	72 ABC	0.3595 ABC
Delta 90/10 Fescue Blue Mix	4.0 BC	73 ABC	0.3480 ABCDE
Delta Bolero Plus Mix 90/10	4.7 AB	81 AB	0.3493 ABCD
Delta Native Bentgrass	3.0 E	58 EF	0.3244 EFG
Delta Native Biofiltration Mix	3.3 CDE	67 CDE	0.3332 DEF
Delta Native Mow Free Mix	3.2 DE	58 DEF	0.3187 FG
NewMilleniaDwarfFescueBlend	4.0 ABCD	71 ABCD	0.3400 CDEF
PPGTF105	4.7 AB	82 A	0.3670 AB
PPGTF142	4.8 A	75 ABC	0.3436 BCDE
PPGTF145	4.8 A	77 ABC	0.3513 ABCD
PPGTF156	4.7 AB	80 AB	0.3500 ABCD
Pearl's Premium	4.0 BC	77 ABC	0.3707 A
Spyder LS	4.3 AB	78 AB	0.3511 ABCD
Stover Native All Purpose Mix	3.2 DE	57 EF	0.3278 DEFG
Stover Native Bentgrass	2.8 E	50 F	0.3072 G
Stover Native Fine Fescue Mix	3.5 CDE	68 CDE	0.3375 CDEF
Titanium LS	4.3 AB	71 BC	0.3398 CDEF

**Table 2. Lawn/Native grasses quality, cover (%) and Dark Green Color Index (DGCI) on Aug 25 2014.**

<b>Product/Species/Variety</b>	<b>Quality</b>	<b>Cover (%)</b>	<b>DGCI</b>
Cutting Edge Sun and Shade Mix	4.8 ABCD	48 ABC	0.368 ABC
Delta 90/10 Fescue Blue Mix	5.2 ABC	40 ABC	0.3692 ABC
Delta Bolero Plus Mix 90/10	5.0 ABCD	36 ABC	0.3665 ABC
Delta Native Bentgrass	2.3 F	28 BC	0.3708 ABC
Delta Native Biofiltration Mix	3.7 E	29 BC	0.3717 AB
Delta Native Mow Free Mix	4.2 CDE	33 ABC	0.3576 BC
NewMilleniaDwarfFescueBlend	4.7 ABCDE	31 ABC	0.3664 ABC
PPGTF105	5.3 AB	51 A	0.3739 A
PPGTF142	5.5 A	49 AB	0.3731 A
PPGTF145	4.8 ABCD	45 ABC	0.3697 ABC
PPGTF156	5.3 AB	47 ABC	0.3651 ABC
Pearl's Premium	4.8 ABCD	43 ABC	0.3696 ABC
Spyder LS	4.3 BCDE	31 ABC	0.3583 BC
Stover Native All Purpose Mix	4 DE	41 ABC	0.3688 ABC
Stover Native Bentgrass	1.7 F	27 C	0.3657 ABC
Stover Native Fine Fescue Mix	4.5 ABCDE	45 ABC	0.3561 C
Titanium LS	4.5 ABCDE	36 ABC	0.366 ABC