

Stop #8: Evaluation of Turfgrass Species and Cultivars Under Deficit Irrigation

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Objectives:

Assess the quality of native sodded cool-season mixes, seeded cool- and warm-season grasses, and mixes during the summer under a deficit irrigation regime.

Material and Methods:

Delta Bluegrass Co. entries (following pages) were sodded in October 2013. The area is divided in three independent separate studies: native sod, no mow sod, and tall fescue mixes sod. The three areas were subjected to one dry down cycle in the summer of 2014 and deficit irrigation (60% ET_0) in 2015. Starting 1 June 2016, the areas were hand watered at 70% ET_0 . OreGro mixes (following pages) were seeded in April 2015 and were subjected to a dry down cycle in the summer of 2015. OreGro cool-season species (following pages) were seeded in December 2015. Both OreGro studies were hand watered at 60% ET_0 starting 1 June 2016. Plots were rated every two weeks for quality (1-9 scale, 9 = best), NDVI, and digital image analysis.

Results:

Drought conditions during the two previous summers lead to wilting and eventually turf stand losses in the Delta Bluegrass plots. Therefore, turf quality was already below acceptable levels before the beginning of deficit irrigation in 2016. Nevertheless, at 70% ET_0 no differences between grass species were detected (Fig. 1), and no further turf loss was observed.

OreGro mixes showed the highest potential for water conservation. Plots all started above acceptable quality levels and some of them lasted more than a month at 60% ET_0 replacement before dropping below acceptable levels. Top performing mixes and cultivars are shown in Fig. 2.

OreGro cool-season species did not establish successfully before the beginning of the deficit irrigation. As a consequence, plots never achieved sufficient turf quality, and extreme to complete turf loss was observed in the majority of the plots (data not shown).

Acknowledgments:

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Delta Bluegrass Native and No Mow Sod Deficit Irrigation Study

No.	Product/Species/Variety	Company
1	Delta Native Mow Free Mix <ul style="list-style-type: none"> ➤ <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
2	Delta Native Biofiltration Mix <ul style="list-style-type: none"> ➤ <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	Delta Preservation Mix <ul style="list-style-type: none"> ➤ <i>Nassella cernua</i> - Nodding needlegrass ➤ <i>Nassella pulchra</i> - Purple needlegrass (California's State Grass) ➤ <i>Koeleria macrantha</i> – Junegrass ➤ <i>Festuca rubra</i> Molate – Red Fescue 	Delta Bluegrass Company
4*	Delta Native Bentgrass <ul style="list-style-type: none"> ➤ <i>Agrostis pallens</i> 	Delta Bluegrass Company

*Not included in the no mow study

UCR Delta Sod Tall Fescue Mixes Deficit Irrigation Study

1	Delta Bolero Mix	Delta Bluegrass Company
2	Delta 90/10 Fescue/Blue Mix	Delta Bluegrass Company

UCR Delta Bluegrass Sod Plot Plan



No Mow

101 1	102 3	103 2
201 3	202 1	203 2
301 2	302 3	303 1

Native grasses

101 3	102 4	103 1	104 2
201 4	202 3	203 2	204 1
301 2	302 1	303 4	304 3

Tall fescue mixes

101 1A	201 1B	301 2A
102 2C	202 2B	302 1C

OreGro Mixes Deficit Irrigation Study

No.	Product/Species/Variety	Company
1	Drought Buster <ul style="list-style-type: none"> ➤ 'Escalade' tall fescue 34% ➤ '04-WALK' tall fescue 30% ➤ '04-DUST' tall fescue 30% 	OreGro
2	Drought Buster <ul style="list-style-type: none"> ➤ 'Escalade' tall fescue 30% ➤ '04-WALK' tall fescue 30% ➤ '04-DUST' tall fescue 30% ➤ 'Baron' Kentucky bluegrass 10% 	OreGro
3	Premium mixture <ul style="list-style-type: none"> ➤ Drought Buster 40% ➤ Desert Star 40% ➤ 'Baron' Kentucky bluegrass 20% 	OreGro
4	Sport Mix #1 <ul style="list-style-type: none"> ➤ Desert Star 40% ➤ Drought Buster 30% ➤ Double Play 30% 	OreGro
5	Sport Mix #2 <ul style="list-style-type: none"> ➤ Desert Star 70% ➤ Double Play 30% 	OreGro
6	Sport Mix #3 <ul style="list-style-type: none"> ➤ Desert Star 65% ➤ Baron' Kentucky bluegrass 15% ➤ Double Play 20% 	OreGro
7	Slope Control <ul style="list-style-type: none"> ➤ 'Chancellor' chewings fescue 34% ➤ 'Dall' sheeps fescue 33% ➤ 'Granite' hard fescue 33% 	OreGro
8	Contractor's Choice <ul style="list-style-type: none"> ➤ 'Kentucky 32' tall fescue 70% ➤ '04-WALK' tall fescue 15% ➤ '04-DUST' tall fescue 15% 	OreGro
9	'Kentucky 32' tall fescue	OreGro
10	Rapid Turf 600 <ul style="list-style-type: none"> ➤ Desert Star 60% ➤ 'NuSprint' annual ryegrass 40% 	OreGro
11	Rapid Turf 600 TF <ul style="list-style-type: none"> ➤ Drought Buster 60% ➤ 'NuSprint' annual ryegrass 40% 	OreGro
12	Double Play Bermuda <ul style="list-style-type: none"> ➤ 'Blackjack' bermudagrass 50% ➤ 'Transcontinental' bermudagrass 50% 	OreGro
13	Double Play Bermuda <ul style="list-style-type: none"> ➤ 'Riviera' bermudagrass 50% ➤ 'Transcontinental' bermudagrass 50% 	OreGro
14	'Escalade' tall fescue	OreGro
15	'04-DUST' tall fescue	OreGro

OreGro Cool-Season Species and Blends Deficit Irrigation Study

No.	Product/Species/Variety	Company
1	'Continental II' Perennial Ryegrass	OreGro
2	'Ribyer II' Perennial Ryegrass	OreGro
3	'NuSprint' Annual Ryegrass	OreGro
4	Desert Star #1 <ul style="list-style-type: none"> ➤ 'Brea' Perennial Ryegrass ➤ 'Ringer' Perennial Ryegrass ➤ 'Pinstripe II' Perennial Ryegrass 	OreGro
5	Desert Star #2 <ul style="list-style-type: none"> ➤ Brea' Perennial Ryegrass ➤ 'Ringer' Perennial Ryegrass ➤ 'Pinstripe II' Perennial Ryegrass 	OreGro
6	Sport Mix #4 <ul style="list-style-type: none"> ➤ Desert Star ➤ Baron' Kentucky bluegrass 	OreGro
7	'GreenLink' Annual Ryegrass	OreGro
8	'Ringer' Perennial Ryegrass	OreGro
9	Fall Contractors' Mix	OreGro
10	Rapid Turf 500 <ul style="list-style-type: none"> ➤ Desert Star 50% ➤ 'NuSprint' annual ryegrass 50% 	OreGro
11	Rapid Turf 750 <ul style="list-style-type: none"> ➤ Desert Star 75% ➤ 'NuSprint' annual ryegrass 25% 	OreGro
12	'Pinstripe' Perennial Ryegrass	OreGro
13	'Brea' Perennial Ryegrass	OreGro
14	'Premium turf' Annual Ryegrass	OreGro

OreGro Mixes plot plan

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

OreGro Mixes plot plan

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

↑ North

Fig. 1. Quality of native, no mow and tall fescue sod mixes during the summer of 2016. Riverside, CA.

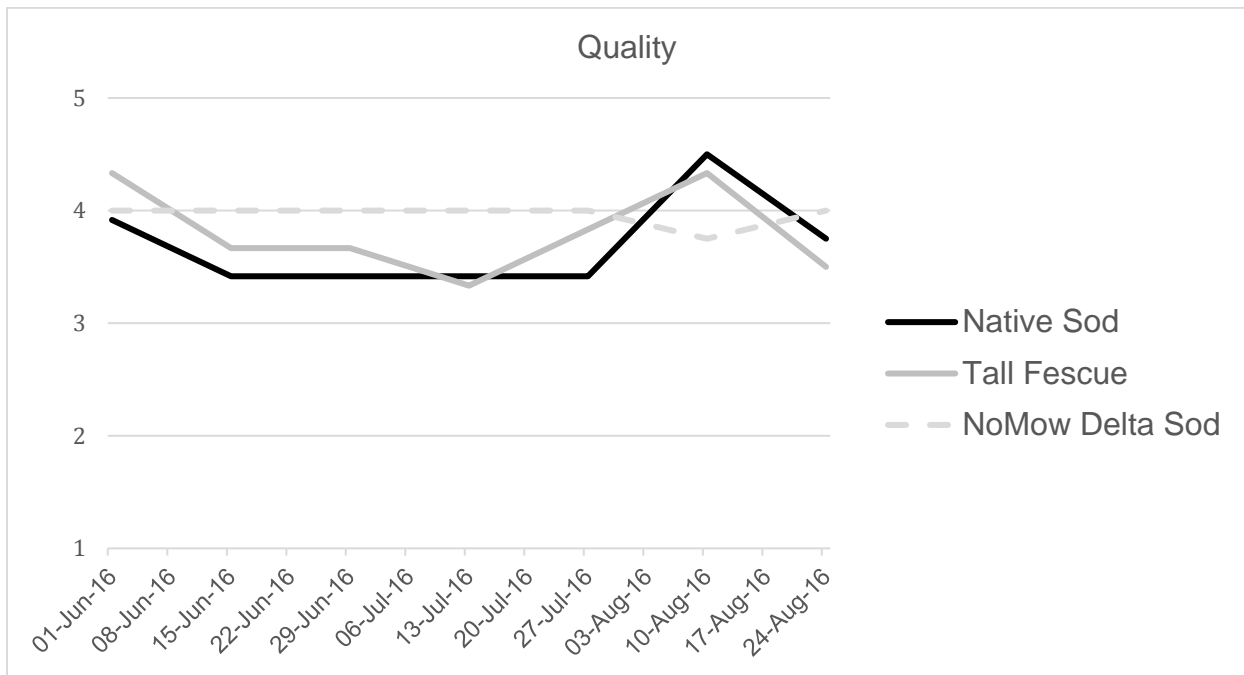


Fig. 2 Quality of top performing OreGro seeded cool-, warm-season species and mixes during the summer of 2016. Riverside, CA.

