Stop #6: Evaluation of Products for Alleviation of Salinity

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Objectives:

To evaluate the efficacy of products on bermudagrass turf to reduce stress caused by irrigation with saline water.

Methods:

The plot area was sodded with 'Tifway II' bermudagrass on 6 August 2012 on a Hanford fine sandy loam with no pre-existing salinity issues. All treatments were applied initially on 26 May 2016. The turf is mowed three times per week at 0.5 inches. Standard bermudagrass cultural practices are maintained throughout the study, including 5 lbs N/M/yr. Plots are irrigated at 75% ET_0 with water that matches the same ion composition of the Colorado River (see table below). Every two weeks, plots were evaluated for turf quality, NDVI and volumetric soil water content. In addition, Digital Image Analysis and leachate are collected on the same day. Soil samples will be collected at the end of bermudagrass growing season separately for each combination of chemical treatment and replication to assess salinity accumulation in the root zone.

	Saline Irrigation Water Potable Irrigation Wa	
рН	7.57	7.82
Hardness	938.23	215.18
Bicarbonate	209.84	214.72
Carbonate	0.01	0.01
EC (dS/m)	4.43	0.61
Na (ppm)	523.90	53.36
CI (ppm)	996.27	31.13
Boron (ppm)	0.11	0.08
SAR (meq/L)	18.30	3.24
Nitrate Nitrogen (ppm)	5.11	5.18
Phosphate (ppm)	0.40	0.01
Potassium (ppm)	129.76	4.16
Magnesium (ppm)	151.99	12.24
Calcium (ppm)	126.03	66.00
Sulfate (ppm)	707.62	78.10
Manganese (ppm)	0.01	0.01
Iron (ppm)	0.11	0.05

Chemical properties of saline irrigation water used in this study compared to potable irrigation water used elsewhere at the UCR turfgrass facility.

Treatments:

Treatments are applied by hand or using a CO₂ boom sprayer calibrated at 2 gal/M. Treatments are watered in with over 0.4 inches of water immediately following application. For treatment list see table on next page.

<u>Results</u>

For the fourth year in a row, DeSal improved turf quality in comparison to the untreated control. However, UCR002 had the highest benefit on turf quality (Figure 1). No difference in EC was detected in the leachate. Soil analysis at the end of the growing season is needed to determine which treatments have a positive effect on soil chemistry.

No.	Treatment	Company	Rate	Frequency (wks)
1	Untreated Control			
2	ATGS1	Green Industries	1.5 oz/M	2
3	Go Isolates	BioFlora	5 gal/acre	4
4a	TurfRx Saltex	Redox	2.2 oz/M	2
4b	TurfRx PeneCal		1.5 oz/M	2
4c	TurfRx C-85		0.74 oz/M	2
4d	TurfRx Ca Si		1.5 oz/M	2
5a	KaPre Exalt	LidoChem	1 quart/acre	2
5b	Pennamin Perfect=K		2 lb/acre	2
5c	KaPre KelpPlus		1 gal/acre	2
6	Gypsum		5 lb/M	
7	DeSal	Ocean	0.75 oz/M	2
7	StressRx	Organics	6 oz/M	2
7	XP Micro		6 oz/M	2
8a	UCR001a		0.5 oz/M	4
8b	UCR001b		0.36 oz/M	4
8c	UCR001c		6 oz/M	4
8d	UCR001d		0.0236 oz/M	4
9a	UCR002a		0.25 oz/M	2
9b	UCR002b		0.36 oz/M	2
9c	UCR002c		3 oz/M	2
9d	UCR002d		0.0118 oz/M	2
10	Gypsum		10 lb/M	

Salinity Alleviation Study Treatment List 2016

Acknowledgments:

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North									
113	213	313	413	513	613				
1	4	2	5	3	7				
114	214	314	414	514	614				
2	7	10	4	2	5				
115	215	315	415	515	615				
3	2	3	7	6	4				
116	216	316	416	516	616				
4	10	5	10	9	2				
117	217	317	417	517	617				
5	3	7	1	10	3				
118	218	318	418	518	618				
6	5	4	8	7	1				
119	219	319	419	519	619				
7	1	9	2	5	8				
120	220	320	420	520	620				
8	8	6	9	4	6				
121	221	321	421	521	621				
9	6	1	3	1	10				
122	222	322	422	522	622				
10	9	8	6	8	9				

Plot Plan Salinity Alleviation Study (Field 12F-4) North

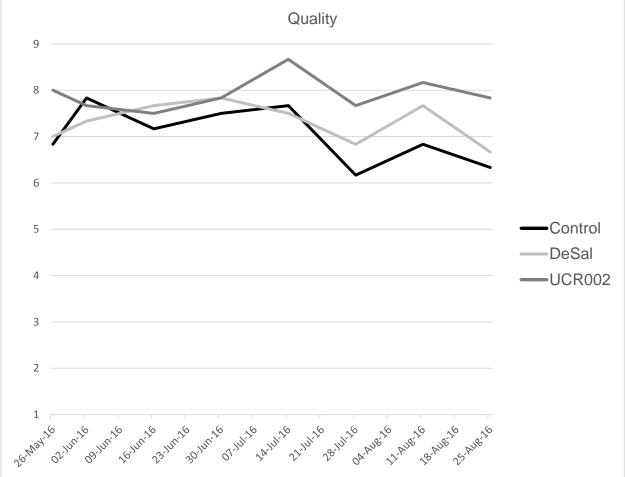


Figure 1. Quality of treatments that performed better than control in at least one rating date.