

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% ET₀ 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.

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

	Saline Irrigation Water	Potable Irrigation Water
pH	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
Cl (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

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.

Results

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.

Salinity Alleviation Study Treatment List 2016

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 Organics	0.75 oz/M	2
7	StressRx		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	

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

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

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

