Stop #5: Groundcover Establishment Under Saline Irrigation

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Objectives:

The objectives of this research were to determine how seven vegetatively propagated groundcover species (Kurapia, plugged buffalograss 'UC Verde', *Rhagodia spinescens, Carex praegracilis, Frankenia salina, Frankenia thymifiola*, and inland saltgrass) are affected by increasing salinity levels in irrigation water during establishment.

Methods:

A line-source gradient experiment was designed to alternate distribution of potable and saline water to establish an irrigation salinity gradient, identifying 5 different Electrical conductivity (EC) levels (2, 3, 4.5, 5.5, and 7 dS/m). Groundcover species were plugged on 2 July 2014. Soil is a Hanford fine sandy loam. Irrigation was set to 100% ETo. Percent ground cover is assessed weekly throughout the experiment using Digital Image Analysis.

Results:

On September 2, 2014, 'UC Verde' buffalograss reached the highest percent ground cover (90%) when irrigated with the lowest EC level. However, buffalograss had the most dramatic drop in ground cover when salinity levels increased, reaching only 1% ground cover when EC of irrigation water was 7 dS/m. Similar drops in percent ground cover with increasing salinity levels in irrigation water were observed in *Rhagodia spinescens, Carex praegracilis* and inland saltgrass. Conversely, Kurapia was a fast establisher when irrigated with 2 and 3 dS/m (81% and 88% respectively), and also was the best performer when irrigated with water EC of 7 dS/m (Table 1).

Plot Plan of The Study Area (North)

	6	5	1	3	2	7	4	**Potable Irrigation Line**
	6	5	1	3	2	7	4	
	6	5	1	3	2	7	4	
	6	5	1	3	2	7	4	
	6	5	1	3	2	7	4	**Saline Irrigation Line**
	5	4	6	1	7	3	2	
	5	4	6	1	7	3	2	
	5	4	6	1	7	3	2	
	5	4	6	1	7	3	2	
	5	4	6	1	7	3	2	**Potable Irrigation Line**
	3	2	7	5	6	4	1	
	3	2	7	5	6	4	1	
	3	2	7	5	6	4	1	
	3	2	7	5	6	4	1	
	3	2	7	5	6	4	1	**Saline Irrigation Line**

1 *Carex praegracilis*
2 *Frankenia salina*
3 *Frankenia thymifiola*
4 Kurapia
5 Inland saltgrass
6 *Rhagodia spinescens*
7 ‘UC Verde’ buffalograss

Table 1. Percent ground cover affected by species and EC levels.

Species	EC (dS/m)	Ground Cover (%)
Carex praegracilis	2	22 EFGHI
Carex praegracilis	3	24 EFGHI
Carex praegracilis	4.5	18 FGHI
Carex praegracilis	5.5	23 EFGHI
Carex praegracilis	7	3 HI
Frankenia salina	2	73 ABCD
Frankenia salina	3	43 CDEFGHI
Frankenia salina	4.5	39 CDEFGHI
Frankenia salina	5.5	46 ABCDEFGH
Frankenia salina	7	42 CDEFGHI
Frankenia thymifiola	2	64 ABCDE
Frankenia thymifiola	3	48 ABCDEFG
Frankenia thymifiola	4.5	43 CDEFGHI
Frankenia thymifiola	5.5	52 ABCDEF
Frankenia thymifiola	7	49 ABCDEF
Kurapia	2	81 ABC
Kurapia	3	88 AB
Kurapia	4.5	53 ABCDEF
Kurapia	5.5	44 BCDEFGHI
Kurapia	7	60 ABCDEF
Rhagodia spinescens	2	51 ABCDEF
Rhagodia spinescens	3	46 ABCDEFGH
Rhagodia spinescens	4.5	24 EFGHI
Rhagodia spinescens	5.5	44 BCDEFGHI
Rhagodia spinescens	7	29 DEFGHI
Inland Saltgrass	2	49 ABCDEFG
Inland Saltgrass	3	40 CDEFGHI
Inland Saltgrass	4.5	48 ABCDEFG
Inland Saltgrass	5.5	39 CDEFGHI
Inland Saltgrass	7	28 EFGHI
‘UC Verde’ buffalograss	2	90 A
‘UC Verde’ buffalograss	3	44 BCDEFGHI
‘UC Verde’ buffalograss	4.5	31 DEFGHI
‘UC Verde’ buffalograss	5.5	5 GHI
‘UC Verde’ buffalograss	7	1 I

Means followed by same letter are not significantly different (P = 0.05).