

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

1 *Carex praegracilis*

4 Kurapia

7 'UC Verde' buffalograss

2 *Frankenia salina*

5 Inland saltgrass

3 *Frankenia thymifolia*

6 *Rhagodia spinescens*

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

Species	EC (dS/m)	Ground Cover (%)
<i>Carex praegracilis</i>	2	22 EFGHI
<i>Carex praegracilis</i>	3	24 EFGHI
<i>Carex praegracilis</i>	4.5	18 FGHI
<i>Carex praegracilis</i>	5.5	23 EFGHI
<i>Carex praegracilis</i>	7	3 HI
<i>Frankenia salina</i>	2	73 ABCD
<i>Frankenia salina</i>	3	43 CDEFGHI
<i>Frankenia salina</i>	4.5	39 CDEFGHI
<i>Frankenia salina</i>	5.5	46 ABCDEFGH
<i>Frankenia salina</i>	7	42 CDEFGHI
<i>Frankenia thymifiola</i>	2	64 ABCDE
<i>Frankenia thymifiola</i>	3	48 ABCDEFG
<i>Frankenia thymifiola</i>	4.5	43 CDEFGHI
<i>Frankenia thymifiola</i>	5.5	52 ABCDEF
<i>Frankenia thymifiola</i>	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
<i>Rhagodia spinescens</i>	2	51 ABCDEF
<i>Rhagodia spinescens</i>	3	46 ABCDEFGH
<i>Rhagodia spinescens</i>	4.5	24 EFGHI
<i>Rhagodia spinescens</i>	5.5	44 BCDEFGHI
<i>Rhagodia spinescens</i>	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).