

**HASLEM SALINITY TRIAL – DUCHESNE COUNTY, UT
FINAL REPORT
2006**

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The Haslem Salinity Trial was designed to evaluate the performance of 13 accessions, some traditionally used as well as several new varieties, when grown in saline soils of Duchesne County, Utah. Many farms in the area have had a history of irrigation related problems that have resulted in severe salinity, erosion, and other agronomic limitations. Due to the soil limitations of the area, there has always been some interest in finding species or management techniques that would improve yields.

This salinity tolerance trial tested 13 different varieties or accessions:

1. Greenar intermediate wheatgrass
2. Alkar tall wheatgrass
3. RS Hoffman (natural quackgrass X bluebunch wheatgrass)
4. NewHy hybrid wheatgrass (quackgrass X bluebunch wheatgrass)
5. Bozoisky Russian wildrye
6. Fawn tall fescue
7. Magnar basin wildrye
8. Hycrest II crested wheatgrass
9. SYN-A Russian wildrye
10. Tetraploid Russian wildrye
11. M5 giant wildrye X basin wildrye
12. Vinall Russian wildrye
13. Garrison creeping foxtail

The location for the plots was chosen because of the soils (a very heavy clay loam), variable levels of salinity, and access to irrigation. Before the trial, this area was an old alfalfa field with weed and salinity problems. The salinity ranged from 1.7 to 21.7 mmhos. The pH was 7.5 to 8.5; the lower values may have been a result of the buffering capabilities of gypsum. The total water holding capacity was two inches per foot. Whitetop and foxtail barley were prevalent invaders.

Plots of each species were approximately 8 feet wide and 24 feet long. All 13 accessions were planted in the same area and replicated 4 times along the saline gradient resulting in 52 total plots.

For irrigation purposes, the plots were designed to fit into one set of a wheel line. The area was seeded in 1993 without fertilizer. Because the test area was an old alfalfa field with weed problems, a post emergent herbicide was used to control the volunteer alfalfa.

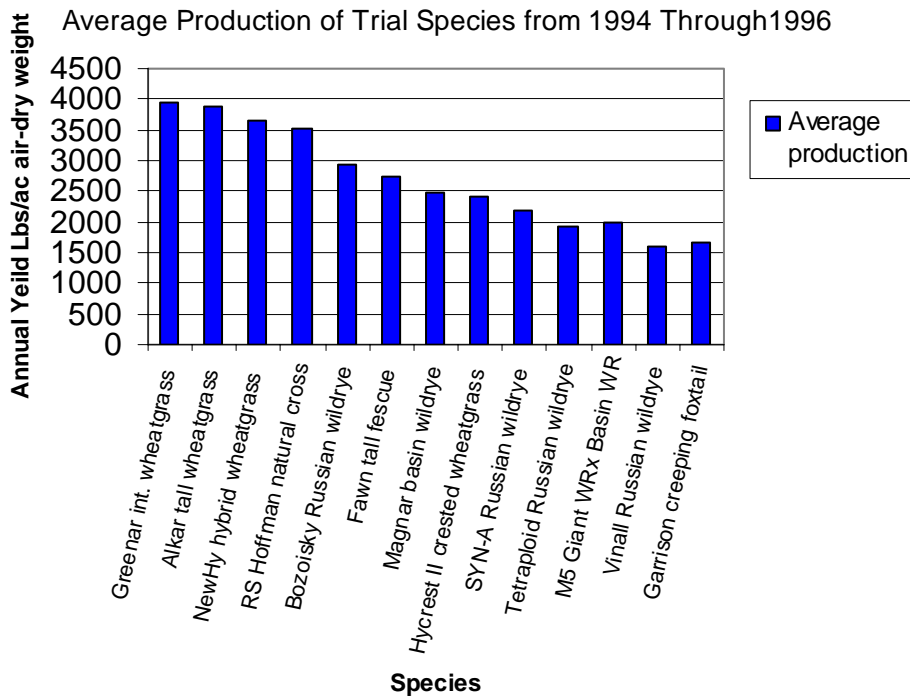
Results

The intermediate wheatgrass and tall wheatgrass had the highest yields and salt tolerance, but the lowest palatability. NewHy and RS Hoffman performed well, with high yields at lower salinity levels. Bozoisky Russian wildrye had the best performance of the wildrye varieties.

Observations

Plants	
Greenar intermediate wheatgrass	Good salt tolerance and productive, but low palatability.
Alkar tall wheatgrass	Tall wheatgrass had very high salt tolerance and high productivity, but low palatability. It provides good standing cover in winter.
RS Hoffman	Similar to NewHy in behavior, but appears to utilize nitrogen better and does not display the chlorosis traits that NewHy does.
NewHy hybrid wheatgrass	This plant showed high levels of salt tolerance. It had low to moderate germination rates, good seedling vigor, good palatability and proved to be productive at low to moderate salinity levels. At high salinity levels, survival was good, but production dropped off dramatically. It also tended to have chlorosis at all salinity levels.
Bozoisky Russian wildrye	This variety seeded well, and was moderately salt and drought tolerant. It greened up well in the fall for good fall forage.
Fawn tall fescue	Very high drought tolerance and salt tolerance. Low palatability and poor overall production. The plant did not respond well to irrigation during the growing season.
Magnar basin wildrye	Productive if a good stand is achieved. It has good traits for cover habitat and standing winter forage crop. However, the plant had sparse establishment and was coarse with low palatability
Hycrest II crested wheatgrass	This variety had good early spring and late fall green up. Salt tolerance was low, greater than 7 mmhos the plant was negatively affected. The plant had poor regrowth response to irrigation during the growing season.
SYN-A Russian wildrye	Performed similar to Bozoisky Russian wildrye.
Tetraploid Russian wildrye	Less productive and vigorous than Bozoisky Russian wildrye.
M5 giant wildrye X basin wildrye	This plant had poor establishment and low seedling vigor. However, after 4 years the stand appeared vigorous and it was spreading.
Vinall Russian wildrye	This variety did not perform well and had no advantage over Bozoisky Russian wildrye. It had poor establishment and low production.
Garrison creeping foxtail	This variety was negatively affected by drought and did not perform well perhaps due to less irrigation than it required. In this trial it did not appear salt tolerant beyond 6 mmhos.

Plants	1994	1995	1996	Average production
Greenar intermediate wheatgrass	3,600	5,200	3,000	3,933
Alkar tall wheatgrass	3,000	5,800	2,800	3,867
RS Hoffman – natural cross	4,000	4,000	2,600	3,533
NewHy hybrid wheatgrass	3,600	5,200	2,200	3,667
Bozoisky Russian wildrye	2,800	4,000	2,000	2,933
Fawn tall fescue	3,400	3,200	1,600	2,733
Magnar basin wildrye	2,000	3,400	1,000	2,133
Hycrest II crested wheatgrass	2,800	3,200	1,200	2,400
SYN-A Russian wildrye	2,000	2,600	1,000	1,867
Tetraploid Russian wildrye	2,000	2,400	1,400	1,933
M5 giant wildrye X basin wildrye	1,800	2,800	1,400	2,000
Vinall Russian wildrye	1,400	2,400	1,000	1,600
Garrison creeping foxtail	1,600	2,400	1,000	1,667



Discussion

With good management nearly all species evaluated do well up to 8 mmhos (similar to the tolerance of barley). On more extreme sites, the options are still limited, but NewHy, RS Hoffman, intermediate wheatgrass and Russian wildrye have potential to be used as alternatives to tall wheatgrass.

Benefits from this project are estimated to be 55 tons per year salt load reduction to the river system, 17 acre feet deep percolation reduction, and a substantial increase in crop production. Brett Prevedel and the landowner initiated the project. Howard Horton with ARS coordinated efforts and completed the planting. If there is further interest in this project, please contact Brett Prevedel at the Roosevelt, UT, NRCS Field Office.

Photos

