

## FORAGE SUITABILITY GROUP Saline

**FSG No.:** G060AY895SD

**Major Land Resource Area:** 60A - Pierre Shale Plains and Badlands



### Physiographic Features

This group is located on flood plains with high water tables.

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	2600	3300
<b>Slope (percent):</b>	0	2
<b>Flooding:</b>		
<b>Frequency:</b>	Occasional	Occasional
<b>Duration:</b>	Brief	Brief
<b>Ponding:</b>		
<b>Depth (inches):</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	Medium	High

### Climatic Features

This group occurs in a mid-continental climate characterized by wide seasonal temperature and precipitation fluctuations and extremes.

Annual precipitation varies widely from year to year in MLRA 60A. Average annual precipitation for all climate stations listed below is about 15 inches. About 77% of the annual precipitation occurs during the months of April through September. On average there are about 24 days with greater than .1 inches of precipitation during that same time period.

Average annual snowfall ranges from 25 inches at Newell, SD to 45 inches at Oelrichs, SD. Snow cover at depths greater than 1 inch range from 40 days at Newell, SD to 82 days at Colony, WY.

Average July temperatures across the MLRA are about 74 degrees F., and average January temperatures are about 20 degrees F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -47 at Redbird, WY, and a high of 114 recorded at Oelrichs, SD. The MLRA lies mostly in USDA Plant Hardiness Zones 4a and 4b.

At Rapid City, SD, the closest station with records, it is cloudy about 139 days a year. Average morning relative humidity in June is about 78% and average afternoon humidity is 49%.

The climate data listed in the tables below represent high and low ranges and averages for the climate stations and dates listed. For additional climate data access the National Water and Climate Center at

<http://www.wcc.nrcs.usda.gov>

	<b>From</b>	<b>To</b>
<b>Freeze-free period (28 deg)(days):</b> (9 years in 10 at least)	118	137
<b>Last Killing Freeze in Spring (28 deg):</b> (1 year in 10 later than)	May 26	May 14
<b>Last Frost in Spring (32 deg):</b> (1 year in 10 later than)	Jun 07	May 26
<b>First Frost in Fall (32 deg):</b> (1 year in 10 earlier than)	Sep 02	Sep 13

<b>First Killing Freeze in Fall (28 deg):</b> (1 year in 10 earlier than)	<b>From</b> Sep 11	<b>To</b> Sep 21
<b>Length of Growing Season (32 deg)(days):</b> (9 years in 10 at least)	96	117
<b>Growing Degree Days (40 deg):</b>	4231	4913
<b>Growing Degree Days (50 deg):</b>	2400	2852
<b>Annual Minimum Temperature:</b>	-30	-20
<b>Mean annual precipitation (inches):</b>	14	17

**Monthly precipitation (inches) and temperature (F):**

<b>2 years in 10:</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
<b>Precip. Less Than</b>	0.11	0.09	0.30	0.65	1.05	1.04	1.06	0.52	0.37	0.38	0.20	0.15
<b>Precip. More Than</b>	0.49	0.74	1.27	2.50	4.02	4.63	2.98	2.22	1.68	1.62	0.89	0.66
<b>Monthly Average:</b>	0.33	0.42	0.83	1.71	2.69	2.78	1.99	1.47	1.24	1.03	0.53	0.41
<b>Temp. Min.</b>	5.3	10.9	20.0	30.6	40.5	49.8	56.3	53.2	41.7	29.9	18.2	6.5
<b>Temp. Max.</b>	34.3	40.5	49.5	61.5	71.8	82.5	91.2	89.8	79.0	65.6	48.3	36.3
<b>Temp. Avg.</b>	19.9	25.3	34.0	45.8	56.0	66.0	73.6	71.5	60.2	48.0	33.5	22.0

<b><u>Climate Station</u></b>	<b><u>Location</u></b>	<b><u>From</u></b>	<b><u>To</u></b>
SD0236	Ardmore, SD	1961	1990
SD6054	Newell, SD	1961	1990
SD6212	Oelrichs, SD	1961	1990
SD8911	Wasta, SD	1961	1990
SD9537	Zeona, SD	1961	1990
WY1905	Colony, WY	1961	1990
WY7555	Redbird, WY	1961	1990

**Soil Interpretations**

This group consists of poorly drained soils with elevated salinity.

<b>Drainage Class:</b>	Poorly drained	To	Poorly drained
<b>Permeability Class:</b> (0 - 40 inches)	Slow	To	Slow
<b>Frost Action Class:</b>	High	To	High

	<b><u>Minimum</u></b>	<b><u>Maximum</u></b>
<b>Depth:</b>	72	0
<b>Surface Fragments &gt;3" (% Cover):</b>	0	0
<b>Organic Matter (percent):</b> (surface layer)	2.0	4.0
<b>Electrical Conductivity (mmhos/cm):</b> (0 - 24 inches)	8	16
<b>Sodium Absorption Ratio:</b> (0 - 12 inches)	0	1
<b>Soil Reaction (1:1) Water (pH):</b> (0 - 12 inches)	7.4	9
<b>Available Water Capacity (inches):</b> (0 - 60 inches)	6	9
<b>Calcium Carbonate Equivalent (percent):</b> (0 - 12 inches)	0	3

**Adapted Species List**

The following forage species are considered adapted to grow on the soils in this group. Additional information concerning plant characteristics of a number of the listed species as well as individual cultivars of many of those species can be accessed on the web at <http://www.plants.usda.gov>

**Cool Season Grasses**

Altai wildrye	F
Basin wildrye	F
Beardless wildrye	G
Intermediate wheatgrass	F
Newhy hybrid wheatgrass	G
Nuttall's alkaligrass	G
Pubescent wheatgrass	F
Russian wildrye	F
Slender wheatgrass	G
Streambank wheatgrass	F
Tall wheatgrass	G
Thickspike wheatgrass	F
Western wheatgrass	G

**Warm Season Grasses**

Alkali sacaton	F
----------------	---

**Legumes**

Alfalfa	F
Alsike clover	F
Cicer milkvetch	F

G - Good adaptation for forage production on this group of soils in this MLRA

F - Fair adaptation but will not produce at its highest potential

**Production Estimates**

Production estimates listed here should only be used for making general management recommendations. On site production information should always be used for making detailed planning and management recommendations.

The high forage production estimates listed below are based on dense, vigorous stands of climatically adapted, superior performing cultivars. They are properly fertilized for high yields, and pest infestations are kept below economic thresholds. Mechanical harvests are managed to maintain stand life by cutting at appropriate stages of maturity and harvest intervals. If grazed, optimum beginning and ending grazing heights are adhered to. Adequate time is allowed for plant recovery before entering winter dormancy under both uses.

The production estimates listed below represent total annual above ground plant production on an air-dry-matter basis. Estimates of hay and grazing yields can be calculated from these numbers by multiplying them by a harvest efficiency. A 70 percent harvest efficiency is commonly used when converting to hay yields. Pasture harvest efficiency is highly dependent on the grazing management system applied, ranging from 25 to 50 percent.

Forage Crop	Management Intensity	
	<u>Low</u> (lbs/ac)	<u>High</u> (lbs/ac)
Tall wheatgrass	1700	2900
Western wheatgrass	1100	1700

**Forage Growth Curves**

Growth curves estimate the seasonal distribution of growth of the various forage crops. They indicate when the forages may be available for grazing or mechanical harvest.

**Growth Curve Number:** SD0004  
**Growth Curve Name:** Cool season grass  
**Growth Curve Description:** Cool season grass, state wide

<b><u>Percent Production by Month</u></b>											
<b><u>Jan</u></b>	<b><u>Feb</u></b>	<b><u>Mar</u></b>	<b><u>Apr</u></b>	<b><u>May</u></b>	<b><u>Jun</u></b>	<b><u>Jul</u></b>	<b><u>Aug</u></b>	<b><u>Sep</u></b>	<b><u>Oct</u></b>	<b><u>Nov</u></b>	<b><u>Dec</u></b>
0	0	0	10	40	30	10	5	5	0	0	0

**Growth Curve Number:** SD0005  
**Growth Curve Name:** Warm season grass  
**Growth Curve Description:** Warm season grass, state wide

<b><u>Percent Production by Month</u></b>											
<b><u>Jan</u></b>	<b><u>Feb</u></b>	<b><u>Mar</u></b>	<b><u>Apr</u></b>	<b><u>May</u></b>	<b><u>Jun</u></b>	<b><u>Jul</u></b>	<b><u>Aug</u></b>	<b><u>Sep</u></b>	<b><u>Oct</u></b>	<b><u>Nov</u></b>	<b><u>Dec</u></b>
0	0	0	0	10	40	35	15	0	0	0	0

**Growth Curve Number:** SD0002  
**Growth Curve Name:** Alfalfa  
**Growth Curve Description:** MLRA 65, 64, 60A

<b><u>Percent Production by Month</u></b>											
<b><u>Jan</u></b>	<b><u>Feb</u></b>	<b><u>Mar</u></b>	<b><u>Apr</u></b>	<b><u>May</u></b>	<b><u>Jun</u></b>	<b><u>Jul</u></b>	<b><u>Aug</u></b>	<b><u>Sep</u></b>	<b><u>Oct</u></b>	<b><u>Nov</u></b>	<b><u>Dec</u></b>
0	0	0	5	35	35	15	5	5	0	0	0

**Soil Limitations**

These soils have severe limitations to the production of climatically adapted forage species. Species selection and productivity are severely limited by the high salinity levels. Also, these soils are poorly drained and will experience periods when trafficability will be difficult or impossible. These soils are subject to compaction if grazed or machinery is operated on them when wet. Drainage also limits species selection.

**Management Interpretations**

When establishing new stands or renovating stands select species that are tolerant of elevated salinity and sodium levels, and that are tolerant of somewhat poorly and poorly drained soils. Exclude livestock and machinery during extended periods of soil wetness to reduce soil compaction.

**FSG Documentation**

**Similar FSGs:**

<b><u>FSG ID</u></b> G060AY900SD	<b><u>FSG Narrative</u></b> Wet soils do not have restrictive levels of salinity.
-------------------------------------	--

**Inventory Data References:**

Agriculture Handbook 296-Land Resource Regions and Major Land Resource Areas  
 Natural Resources Conservation Service (NRCS) National Water and Climate Center data  
 USDA Plant Hardiness Zone Maps  
 National Soil Survey Information System (NASIS) for soil surveys in South Dakota, Nebraska, Wyoming, and Montana counties in MLRA 60A  
 South Dakota, Nebraska, Wyoming, and Montana NRCS Field Office Technical Guides  
 NRCS National Range and Pasture Handbook  
 Various Agricultural Research Service, Cooperative Extension Service, and NRCS research trials for plant adaptation and production.

**State Correlation:**

This site has been correlated with the following states:

MT  
NE  
SD  
WY

**Forage Suitability Group Approval:**

Original Author: Tim Nordquist

Original Date: 4/17/02

Approval by: Dave Schmidt

Approval Date: