

## FORAGE SUITABILITY GROUP Claypan

**FSG No.:** G064XY800NE

**Major Land Resource Area:** 64 - Mixed Sandy and Silty Tableland

### Physiographic Features

These soils are found on flood plain, outwash plain, terrace, and upland positions including fans and flats.

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	2950	3940
<b>Slope (percent):</b>	0	6
<b>Flooding:</b>		
<b>Frequency:</b>	None	Rare
<b>Duration:</b>	None	Very 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 64. Average annual precipitation for all climate stations listed below is about 16 inches. About 79 percent of the annual precipitation occurs during the months of April through September. On average there are about 26 days with greater than .1 inches of precipitation during that same time period.

Average annual snowfall ranges from 20 inches at Interior, SD to 60 inches at Harrison, NE. Snow cover at depths greater than 1 inch range from 28 days at Interior, SD to 60 days at Long Valley, SD.

Average July temperatures across the MLRA are about 74 degrees F., and average January temperatures are about 22 degrees F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -45 and a high of 114 both recorded at Porcupine, SD. The MLRA lies mostly in USDA Plant Hardiness Zones 4a and 4b, with a small area of warmer 5a around Alliance, NE.

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)	111	158
<b>Last Killing Freeze in Spring (28 deg):</b> (1 year in 10 later than)	Jun 01	May 05
<b>Last Frost in Spring (32 deg):</b> (1 year in 10 later than)	Jun 12	May 14
<b>First Frost in Fall (32 deg):</b> (1 year in 10 earlier than)	Sep 06	Sep 19
<b>First Killing Freeze in Fall (28 deg):</b> (1 year in 10 earlier than)	Sep 11	Sep 28

	<b>From</b>	<b>To</b>
<b>Length of Growing Season (32 deg)(days):</b> (9 years in 10 at least)	94	135
<b>Growing Degree Days (40 deg):</b>	3867	4974
<b>Growing Degree Days (50 deg):</b>	2128	2913
<b>Annual Minimum Temperature:</b>	-30	-15
<b>Mean annual precipitation (inches):</b>	15	18

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

<b>2 years in 10:</b>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
<b>Precip. Less Than</b>	0.07	0.10	0.32	0.71	1.22	1.19	1.43	0.66	0.34	0.47	0.12	0.15
<b>Precip. More Than</b>	0.37	0.61	1.87	3.10	4.14	5.14	3.84	2.61	2.02	1.57	0.81	0.50

**Monthly Average:**      0.33   0.38   0.97   1.88   2.89   2.90   2.32   1.50   1.33   0.97   0.47   0.38

**Temp. Min.**                8.5    13.4   19.6   28.9   38.8   48.6   55.1   52.7   42.0   31.1   19.8   11.0  
**Temp. Max.**               35.1   40.2   49.7   63.0   73.1   83.6   92.0   91.0   79.9   67.9   48.9   37.1  
**Temp. Avg.**                22.4   27.4   35.2   46.2   56.8   66.7   74.2   72.2   61.3   49.4   35.1   24.5

<b><u>Climate Station</u></b>	<b><u>Location</u></b>	<b><u>From</u></b>	<b><u>To</u></b>
SD4184	Interior, SD	1961	1990
SD4983	Long Valley, SD	1961	1990
SD6736	Porcupine, SD	1963	1990
NE1575	Chadron, NE	1961	1990
NE0130	Alliance, NE	1961	1990
NE3615	Harrison, NE	1961	1990

**Soil Interpretations**

This group consists mostly of moderately well and well drained, coarse to medium textured soils formed from sediments, residuum, and alluvium. They have claypan subsoils with slow and very slow permeability. The underlying material and lower part of the subsoil typically have high amounts of soluble salts and are sodic.

<b>Drainage Class:</b>	Somewhat poorly drained	To	Well drained
<b>Permeability Class:</b> (0 - 40 inches)	Slow	To	Very slow
<b>Frost Action Class:</b>	Low	To	High

	<b><u>Minimum</u></b>	<b><u>Maximum</u></b>
<b>Depth:</b>	20	
<b>Surface Fragments &gt;3" (% Cover):</b>	0	3
<b>Organic Matter (percent):</b> (surface layer)	1.0	4.0
<b>Electrical Conductivity (mmhos/cm):</b> (0 - 24 inches)	4	16
<b>Sodium Absorption Ratio:</b> (0 - 12 inches)	13	20
<b>Soil Reaction (1:1) Water (pH):</b> (0 - 12 inches)	5.6	8.4
<b>Available Water Capacity (inches):</b> (0 - 60 inches)	4	8
<b>Calcium Carbonate Equivalent (percent):</b> (0 - 12 inches)	0	6



### **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:** SD0002

**Growth Curve Name:** Alfalfa

**Growth Curve Description:** Alfalfa, MLRAs 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

**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

### **Soil Limitations**

These soils have severe limitations to the production of climatically adapted forage species. The claypan and the soluble salts and sodicity in the subsoil produce an unfavorable rooting environment, limiting species selection and production potential.

### **Management Interpretations**

Selecting forage species that are tolerant of salinity and sodicity and can root in dense, clayey subsoils can reduce the impact on yields.

### **FSG Documentation**

#### **Similar FSGs:**

##### **FSG ID**

G064XY210N

##### **FSG Narrative**

Clayey subsoils are less saline and/or sodic and have a more favorable rooting zone.

#### **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, and Wyoming counties in MLRA 64

South Dakota and Nebraska and Wyoming NRCS Field Office Technical Guides

NRCS National Range and Pasture Handbook

Various South Dakota and Nebraska 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:

NE

SD

WY

**Forage Suitability Group Approval:**

Original Author: Tim Nordquist

Original Date: 4/15/02

Approval by: Dana Larsen

Approval Date: