

## FORAGE SUITABILITY GROUP

### Loam

**FSG No.:** G064XY100NE

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

#### Physiographic Features

The soils in this group are found on upland slopes and swales, tablelands, fans and fan aprons, pediments, terraces, and non-flooded flood plains.



	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	2950	3940
<b>Slope (percent):</b>	0	15
<b>Flooding:</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Ponding:</b>		
<b>Depth (inches):</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	Negligible	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. Precipitation in this MLRA is less than needed for optimum forage production and is the single largest factor limiting production from this group on non-irrigated lands.

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)	<b>From</b> Sep 11	<b>To</b> Sep 28
<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>	<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>	0.07	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
<b>Monthly Average:</b>	0.33	0.38	0.97	1.88	2.89	2.90	2.32	1.50	1.33	0.97	0.47	0.38
<b>Temp. Min.</b>	8.5	13.4	19.6	28.9	38.8	48.6	55.1	52.7	42.0	31.1	19.8	11.0
<b>Temp. Max.</b>	35.1	40.2	49.7	63.0	73.1	83.6	92.0	91.0	79.9	67.9	48.9	37.1
<b>Temp. Avg.</b>	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 of moderately deep to very deep, mostly well drained, moderately coarse to moderately fine textured soils formed mostly from wind and water deposited materials or materials weathered from sedimentary rock. Available water capacity is moderate to high and permeability is slow to moderately rapid.

<b>Drainage Class:</b>	Moderately well drained	To	Well drained
<b>Permeability Class:</b> (0 - 40 inches)	Slow	To	Moderately rapid
<b>Frost Action Class:</b>	Low	To	Moderate

	<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)	0.5	4.0
<b>Electrical Conductivity (mmhos/cm):</b> (0 - 24 inches)	0	4
<b>Sodium Absorption Ratio:</b> (0 - 12 inches)	0	10
<b>Soil Reaction (1:1) Water (pH):</b> (0 - 12 inches)	5.6	8.4
<b>Available Water Capacity (inches):</b> (0 - 60 inches)	5	13
<b>Calcium Carbonate Equivalent (percent):</b> (0 - 12 inches)	0	10

**Soil Component List** (Some phases of these soils may also occur in other FSGs)

Albinas	Dawes	Mitchell	Satanta
Alice	Duroc	Mobridge	Skilak
Alliance	Haverson	Munjor	Thirtynine
Altvan	Hemingford	Noden	Tripp
Bayard	Johnstown	Oglala	Ulysses
Blackpipe	Kadoka	Ponderosa	Vetal
Bridget	Keith	Recluse	Woodly
Coaliams	Keya	Ree	
Craft	Kube	Richfield	
Creighton	Mccook	Rosebud	

**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>

<u>Cool Season Grasses</u>	<u>Symbol</u>	<u>Dry</u>	<u>Irrig</u>	<u>Warm Season Grasses</u>	<u>Symbol</u>	<u>Dry</u>	<u>Irrig</u>
Altai wildrye	LEAN3	G	NS	Big bluestem	ANGE	F	G
Basin wildrye	LECI4	G	NS	Little bluestem	SCSC	G	NS
Crested wheatgrass	AGCR	G	NS	Prairie sandreed	CALO	F	NS
Green needlegrass	NAVI4	G	NS	Sand bluestem	ANHA	F	NS
Intermediate wheatgrass	THIN6	G	G	Sideoats grama	BOCU	G	NS
Meadow brome	BRBI2	F	G	Switchgrass	PAVIV	F	G
Orchardgrass	DAGL	NS	G	<u>Legumes</u>	<u>Symbol</u>	<u>Dry</u>	<u>Irrig</u>
Pubescent wheatgrass	THIN6	G	G	Alfalfa	MESA	G	G
Russian wildrye	PSJU3	G	NS	Birdsfoot trefoil	LOCO6	NS	G
Smooth brome	BRINI2	F	G	Canada milkvetch	ASCAC6	F	NS
Streambank wheatgrass	ELLAL	G	NS	Cicer milkvetch	ASCI4	G	F
Tall wheatgrass	THPO7	F	NS	Purple prairieclover	DAPUP	F	NS
Thickspike wheatgrass	ELMA7	G	NS	Red clover	TRPR2	NS	G
Western wheatgrass	PASM	G	NS	Sainfoin	ONVI	F	NS
				White prairieclover	DACAC	F	NS

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  
 NS - Species is not adapted to the site and should not be planted

**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	<u>Dryland</u>		<u>Irrigated</u>	
	Management Intensity		Management Intensity	
	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)
Alfalfa	6000	2300		
Alfalfa/Crested wheatgrass	4900	2000		
Alfalfa/Intermediate wheatgrass	5400	2300	14300	8600
Alfalfa/Pubescent wheatgrass	5400	2300	14300	8600
Alfalfa/Smooth brome grass			14300	8600
Crested wheatgrass	3100	1700		
Intermediate wheatgrass	3700	1700	11400	6900
Pubescent wheatgrass	3700	1700	11400	6900
Smooth brome grass			11400	6900

### 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

<u>Percent Production by Month</u>											
<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>
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

<u>Percent Production by Month</u>											
<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>
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

<u>Percent Production by Month</u>											
<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>
0	0	0	0	10	40	35	15	0	0	0	0

Growth Curve Number: SD0003

Growth Curve Name: Irrigated Alfalfa

Growth Curve Description: Irrigated Alfalfa, state wide

<u>Percent Production by Month</u>											
<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>
0	0	0	5	25	25	20	15	10	0	0	0

### Soil Limitations

These soils have few limitations to the production of climatically adapted forage crops. On steeper slopes, water erosion is a potential problem during establishment, when renovating stands, and in thin established stands.

### Management Interpretations

Incorporating erosion control practices during the establishment period and including sod forming grass species in stands, especially on steeper slopes, will reduce the potential for sheet and rill erosion. Properly locating facilitating practices such as fences, lanes, and water developments can help control livestock movement, reduce trailing perpendicular to steeper slopes, and evenly distribute grazing pressure.

## **FSG Documentation**

### **Similar FSGs:**

#### **FSG ID**

G064XY120N

#### **FSG Narrative**

Droughty Loam soils are shallower or coarser textured resulting in lower available water capacity and lower production potential.

G064XY500N

Overflow soils receive additional moisture due to a favorable landscape position resulting in a higher production potential.

### **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: