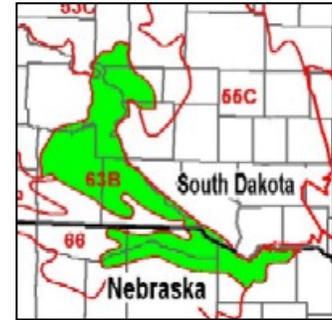


## FORAGE SUITABILITY GROUP Limy Upland

**FSG No.:** G063BY400SD

**Major Land Resource Area:** 63B - Southern Rolling Pierre Shale Plains



### Physiographic Features

The soils in this group are found on upland slopes.

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	1300	2000
<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>	Medium	Very 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 63B. Average annual precipitation for all climate stations listed below is about 22 inches. About 76 percent of the annual precipitation occurs during the months of April through September. On average there are about 29 days with greater than .1 inches of precipitation during that same time frame.

Average annual snowfall ranges from 19 inches at Creighton, NE to 44 inches at Winner, SD. Snow cover at depths greater than 1 inch range from 4 days at Stephan, SD to 57 days at Winner.

Average July temperatures across the MLRA are about 76 degrees F., and average January temperatures are about 17 degrees F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -37 and a high of 114 both recorded at Kennebec, SD. The MLRA lies in USDA Plant Hardiness Zones 4b and 5a.

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)	128	152
<b>Last Killing Freeze in Spring (28 deg):</b> (1 year in 10 later than)	May 20	May 08
<b>Last Frost in Spring (32 deg):</b> (1 year in 10 later than)	Jun 09	May 17
<b>First Frost in Fall (32 deg):</b> (1 year in 10 earlier than)	Sep 01	Sep 21
<b>First Killing Freeze in Fall (28 deg):</b> (1 year in 10 earlier than)	Sep 19	Sep 30

	<b>From</b>	<b>To</b>
<b>Length of Growing Season (32 deg)(days):</b> (9 years in 10 at least)	92	131
<b>Growing Degree Days (40 deg):</b>	4526	5505
<b>Growing Degree Days (50 deg):</b>	2652	3257
<b>Annual Minimum Temperature:</b>	-25	-15
<b>Mean annual precipitation (inches):</b>	18	25

**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>	0.06	0.09	0.27	0.66	1.18	1.80	1.24	0.73	0.65	0.55	0.12	0.13
<b>Precip. More Than</b>	0.54	1.24	2.70	3.97	5.70	5.65	4.96	3.94	4.34	2.64	1.49	0.85

**Monthly Average:**      0.41    0.55    1.56    2.36    3.34    3.54    3.08    2.45    2.13    1.45    0.77    0.56

**Temp. Min.**                1.3     7.5     18.2    31.1    42.2    52.3    58.2    55.5    44.9    32.8    18.9    6.1  
**Temp. Max.**               32.4    38.6    48.5    62.8    74.0    84.0    91.1    88.9    78.7    66.0    47.7    35.2  
**Temp. Avg.**               18.7    24.4    34.9    48.5    59.6    69.5    75.7    73.5    63.2    51.1    35.2    22.4

<b><u>Climate Station</u></b>	<b><u>Location</u></b>	<b><u>From</u></b>	<b><u>To</u></b>
NE1990	Creighton, NE	1961	1990
NE1365	Butte, NE	1961	1990
SD9367	Winner, SD	1961	1990
SD0778	Bonesteel, SD	1961	1990
SD3452	Gregory, SD	1961	1990
SD7992	Stephan, SD	1961	1990
SD4516	Kennebec, SD	1961	1990

**Soil Interpretations**

These are moderately deep to very deep, well drained, medium to fine textured soils with elevated calcium carbonate levels near the soil surface. Permeability ranges from slow to moderate, and available water capacities range from low to high.

<b>Drainage Class:</b>	Well drained	To	Well drained
<b>Permeability Class:</b> (0 - 40 inches)	Moderate	To	Very slow
<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	3.0
<b>Electrical Conductivity (mmhos/cm):</b> (0 - 24 inches)	0	2
<b>Sodium Absorption Ratio:</b> (0 - 12 inches)	0	3
<b>Soil Reaction (1:1) Water (pH):</b> (0 - 12 inches)	6.6	8.4
<b>Available Water Capacity (inches):</b> (0 - 60 inches)	3	11
<b>Calcium Carbonate Equivalent (percent):</b> (0 - 12 inches)	13	50

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

Betts  
Lynch  
Redstoe  
Sully

**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://plants.usda.gov/>

<b><u>Cool Season Grasses</u></b>	<b><u>Symbol</u></b>	<b><u>Dry</u></b>	<b><u>Irrig</u></b>	<b><u>Warm Season Grasses</u></b>	<b><u>Symbol</u></b>	<b><u>Dry</u></b>	<b><u>Irrig</u></b>
Crested wheatgrass	AGCR	G	NS	Big bluestem	ANGE	G	G
Green needlegrass	NAVI4	F	NS	Indiangrass	SONU2	F	G
Intermediate wheatgrass	THIN6	F	G	Little bluestem	SCSC	G	NS
Meadow brome	BRBI2	F	G	Prairie sandreed	CALO	F	NS
Newhy hybrid wheatgrass		F	NS	Sideoats grama	BOCU	G	NS
Orchardgrass	DAGL	NS	G	Switchgrass	PAVIV	F	G
Pubescent wheatgrass	THIN6	G	G	<b><u>Legumes</u></b>	<b><u>Symbol</u></b>	<b><u>Dry</u></b>	<b><u>Irrig</u></b>
Russian wildrye	PSJU3	F	NS	Alfalfa	MESA	G	G
Smooth brome	BRINI2	F	G	Birdsfoot trefoil	LOCO6	NS	G
Western wheatgrass	PASM	G	NS	Cicer milkvetch	ASCI4	G	F
				Purple prairieclover	DAPUP	G	NS
				Red clover	TRPR2	NS	G
				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	6900	3400		
Alfalfa/Intermediate wheatgrass	4000	2600	14300	8600
Alfalfa/Smooth brome grass	4000	2600	14300	8600
Intermediate wheatgrass	4600	2900	11400	6900
Smooth brome grass	4300	2900	11400	6900
Switchgrass	6300	3100		

**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:** SD0001

**Growth Curve Name:** Alfalfa

**Growth Curve Description:** Alfalfa, MLRAs 107, 102B, 63B, 66, 65

<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	30	25	20	15	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**

The primary limitation to the soils in this group is the high lime content close to the soil surface. The lime reduces the availability of some plant nutrients. This reduces species choices and yield potential. Also, because most of these are sloping soils, they are subject to water and wind erosion, especially when establishing or renovating stands. They also tend to be droughty, especially those with lower available water capacity.

### **Management Interpretations**

Selecting forage species that are tolerant of the high lime levels inherent to these soils, and also to droughty conditions can reduce their impact on yields. Including sod forming grass species in stands, especially on steeper slopes, will reduce the potential for sheet and rill erosion. Incorporate both wind and water erosion control practices during the establishment period. 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**

G063BY100S

##### **FSG Narrative**

Loamy soils do not have as high a lime content near the surface and are more productive.

#### **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 and Nebraska counties in MLRA 63B  
South Dakota and Nebraska 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

#### **Forage Suitability Group Approval:**

Original Author: Tim Nordquist

Original Date: 4/3/02

Approval by: Dave Schmidt

Approval Date: