

## FORAGE SUITABILITY GROUP OVERFLOW

**FSG No.:** G063BY500SD

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

### Physiographic Features

The soils in this group are generally found in nearly level to gently sloping positions on flood plains, footslopes, and upland swales. They receive beneficial additional moisture as run-on from up slope, or from flooding.

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	1300	2000
<b>Slope (percent):</b>	0	3
<b>Flooding:</b>		
<b>Frequency:</b>	None	Frequent
<b>Duration:</b>	None	Brief
<b>Ponding:</b>		
<b>Depth (inches):</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	Low	Medium

### 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 timeframe. Precipitation 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 19 inches at Creighton, Nebraska (NE,) to 44 inches at Winner, South Dakota (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<sup>0</sup>F and average January temperatures are about 17<sup>0</sup>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>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>From</b>	<b>To</b>
<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
<b>Monthly Average:</b>	0.41	0.55	1.56	2.36	3.34	3.54	3.08	2.45	2.13	1.45	0.77	0.56
<b>Temp. Min.</b>	1.3	7.5	18.2	31.1	42.2	52.3	58.2	55.5	44.9	32.8	18.9	6.1
<b>Temp. Max.</b>	32.4	38.6	48.5	62.8	74.0	84.0	91.1	88.9	78.7	66.0	47.7	35.2
<b>Temp. Avg.</b>	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**

This group consists of very deep, moderately well and well drained, medium to fine textured soils formed from alluvium. Permeability is slow to moderate, and available water capacity is moderate to high.

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

	<b><u>Minimum</u></b>	<b><u>Maximum</u></b>
<b>Depth:</b>	72	
<b>Surface Fragments &gt;3" (% Cover):</b>	0	3
<b>Organic Matter (percent):</b>	1.0	6.0
(surface layer)		
<b>Electrical Conductivity (mmhos/cm):</b>	0	2
(0 - 24 inches)		
<b>Sodium Absorption Ratio:</b>	0	10
(0 - 12 inches)		
<b>Soil Reaction (1:1) Water (pH):</b>	5.6	8.4
(0 - 12 inches)		
<b>Available Water Capacity (inches):</b>	9	13
(0 - 60 inches)		
<b>Calcium Carbonate Equivalent (percent):</b>	0	18
(0 - 12 inches)		

**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/>.

<u>Cool Season Grasses</u>	<u>Dryland</u>	<u>Irrigated</u>
Green needlegrass	G	NS
Intermediate wheatgrass	G	G
Meadow brome	G	G
Orchardgrass	G	G
Pubescent wheatgrass	G	G
Smooth brome	G	G
Tall wheatgrass	G	NS
Western wheatgrass	G	NS

<u>Warm Season Grasses</u>	<u>Dryland</u>	<u>Irrigated</u>
Big bluestem	G	G
Indiangrass	G	G
Little bluestem	G	NS
Prairie sandreed	F	NS
Sand bluestem	F	NS
Sideoats grama	F	NS
Switchgrass	G	G

<u>Legumes</u>	<u>Dryland</u>	<u>Irrigated</u>
Alfalfa	G	G
Birdsfoot trefoil	G	G
Canada milkvetch	G	NS
Cicer milkvetch	G	F
Illinois bundleflower	G	NS
Purple prairieclover	F	NS
Red clover	G	G
White prairieclover	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. Onsite 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		Management Intensity	
	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)
Alfalfa	10000	4000		
Alfalfa/Intermediate wheatgrass	9700	4000	17100	10300
Alfalfa/Orchardgrass	9700	4000	17100	10300
Alfalfa/Smooth brome grass	9700	4000	17100	10300
Big bluestem	7400	4000		
Intermediate wheatgrass	6300	3100	14300	8600
Orchardgrass	5700	3100	14300	8600
Smooth brome grass	5700	3100	14300	8600
Switchgrass	7400	4000		

**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, MLRA's 107, 102B, 63B, 66, 65

**Percent Production by Month**

<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, statewide

**Percent Production by Month**

<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, statewide

**Percent Production by Month**

<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, statewide

**Percent Production by Month**

<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. Production potential is high. Flooding is a potential hazard to some of these soils. Also, all of these soils receive additional moisture, so the potential exists for soil compaction from grazing or operating machinery on them when wet.

**Management Interpretations**

Soils in this group that are subject to flooding can have forage production adversely impacted if it occurs during the spring or growing season. Flooding duration or the time period plants are under water is more important than flooding frequency for the survival of forage crops. If these soils flood it is generally for only a brief time.

Exclude livestock and machinery during extended periods of soil wetness to reduce soil compaction. When establishing new stands or renovating stands select species and varieties that can make best use of the additional soil moisture this group receives.

## FSG Documentation

### Similar FSG's:

**FSG ID**

**FSG Narrative**

G063BY100S

Loamy soils do not receive the additional water and are less productive.

G063BY700S

Subirrigated soils have elevated water tables that come closer to the surface during part of the growing season.

### 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: Nebraska and South Dakota

### Forage Suitability Group Approval

**Original Author:** Tim Nordquist

**Original Date:** 4/3/02

**Approval by:** Dave Schmidt

**Approval Date:** 8/25/03