

## FORAGE SUITABILITY GROUP (FSG) Subirrigated

**FSG No.:** G066XY700NE

**Major Land Resource Area (MLRA):** 66 - Dakota-Nebraska Eroded Tableland



### Physiographic Features

The soils in this group are found on flood plains, stream terraces, and interdunal swales and valleys of sandhills.

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	1970	2950
<b>Slope (percent):</b>	0	3
<b>Flooding:</b>		
<b>Frequency:</b>	None	Occasional
<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>	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 66. Average annual precipitation for all climate stations listed below is about 21 inches. About 77 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 period. 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 33 inches at O'Neill, Nebraska (NE), to 43 inches at Harrington, South Dakota (SD). Snow cover at depths greater than 1 inch range from 43 days at Springview, NE, to 64 days at Harrington, SD.

Average July temperatures across the MLRA are about 74°F and average January temperatures are about 20°F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -38°F at Harrington and a high of 110 both recorded at Mission, Springview, and O'Neill. 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 [www.wcc.nrcs.usda.gov](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)	120	150
<b>Last Killing Freeze in Spring (28 deg):</b> (1 year in 10 later than)	May 23	May 08
<b>Last Frost in Spring (32 deg):</b> (1 year in 10 later than)	Jun 01	May 20
<b>First Frost in Fall (32 deg):</b> (1 year in 10 earlier than)	Sep 07	Sep 17

	<b>From</b>	<b>To</b>
<b>First Killing Freeze in Fall (28 deg):</b> (1 year in 10 earlier than)	Sep 11	Sep 26
<b>Length of Growing Season (32 deg)(days):</b> (9 years in 10 at least)	104	130
<b>Growing Degree Days (40 deg):</b>	4580	5148
<b>Growing Degree Days (50 deg):</b>	2615	3038
<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>	0.08	0.11	0.33	0.62	1.70	1.51	1.54	0.91	0.65	0.53	0.15	0.16
<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>	0.34	0.49	1.42	2.16	3.40	3.46	3.07	2.22	2.15	1.32	0.71	0.52
<b>Temp. Min.</b>	7.1	12.4	20.8	31.7	42.4	52.3	58.5	55.8	45.2	33.5	20.7	10.0
<b>Temp. Max.</b>	30.3	36.2	46.8	62.1	72.9	82.8	88.7	86.5	76.2	64.5	46.4	33.3
<b>Temp. Avg.</b>	19.7	24.8	34.1	47.1	57.9	68.0	74.2	72.1	61.8	49.8	34.7	22.9

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
SD3574	Harrington SD	1961	1990
SD5620	Mission SD	1966	1990
SD5638	Mission SD	1961	1990
SD0778	Bonesteel SD	1961	1990
NE8090	Springview NE	1961	1990
NE6290	O'Neill NE	1961	1990

**Soil Interpretations**

The subirrigated group consists of very deep, mostly somewhat poorly drained, coarse to medium textured soils. They have a seasonal water table within 12 to 48 inches of the surface during part of the growing season.

<b>Drainage Class:</b>	Poorly drained	To	Moderately well drained
<b>Permeability Class:</b> (0 - 40 inches)	Moderately slow	To	Rapid
<b>Frost Action Class:</b>	Moderate	To	High

	<u>Minimum</u>	<u>Maximum</u>
<b>Depth:</b>	72	
<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)	4	12
<b>Calcium Carbonate Equivalent (percent):</b> (0 - 12 inches)	0	25

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

Boel	Elsmere	Ord	Yockey
Bolent	Lamo	Orwet	
Dunn	Lawet	Platte	
Els	Lex	Wann	

### 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>Symbol</u>		<u>Warm Season Grasses</u>	<u>Symbol</u>	
Creeping foxtail	ALAR	F	Big bluestem	ANGE	G
Green needlegrass	NAVI	F	Indiangrass	SONU2	G
Intermediate wheatgrass	THIN	G	Little bluestem	SCSC	G
Meadow bromegrass	BRBI2	G	Switchgrass	PAVIV	G
Orchardgrass	DAGL	G	<u>Legumes</u>	<u>Symbol</u>	
Pubescent wheatgrass	THIN	G	Alfalfa	MESA	F
Reed canarygrass	PHAR3	G	Alsike clover	TRHY	G
Smooth bromegrass	BRINI2	G	Birdsfoot trefoil	LOCO6	G
Tall wheatgrass	THPO7	G	Canada milkvetch	ASCAC6	F
Western wheatgrass	PASM	G	Cicer milkvetch	ASCI4	F
			Illinois bundleflower	DEIL	F
			Purple prairieclover	DAPUP	F
			Red clover	TRPR2	G
			White prairieclover	DACAC	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. 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.

<u>Forage Crop</u>	<u>Management Intensity</u>	
	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)
Alfalfa	11400	5100
Alfalfa/Intermediate wheatgrass	10300	4600
Alfalfa/Orchardgrass	10300	4600
Alfalfa/Smooth bromegrass	10300	4600
Big bluestem	10300	4600
Creeping foxtail	7400	3400
Intermediate wheatgrass	8000	3400
Orchardgrass	7400	3400
Reed canarygrass	9100	4600
Smooth bromegrass	7400	3400
Switchgrass	9700	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

**Soil Limitations**

These soils have few limitations to the production of climatically adapted forage crops, and production potential is high. Forage species like alfalfa that are less tolerant of saturated soils for extended periods of time may suffer stand loss during wet years when watertables stay abnormally high. A number of these soils have a high lime content near the surface which reduces the availability of some plant nutrients. These soils are also subject to compaction if grazed or machinery is operated on them when wet.

**Management Interpretations**

When establishing new stands select species that are tolerant of somewhat poorly drained, occasionally saturated soils, and that are also capable of utilizing the additional moisture inherent to these soils. Excluding livestock and machinery during extended periods of soil wetness will help reduce soil compaction.

**FSG Documentation**

**Similar FSG's:**

**FSG ID**  
G066XY500N

**FSG Narrative**

Overflow soils do not have watertables that come as near 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 for soil surveys in South Dakota and Nebraska counties in MLRA 66  
 NRCS Nebraska Field Office Technical Guide and South Dakota Technical Guide  
 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:** 4/4/02  
**Approval by:** Dana Larson  
**Approval Date:** 9/20/04