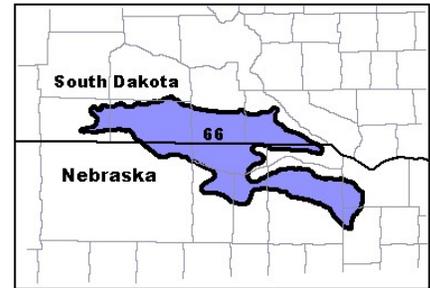


## FORAGE SUITABILITY GROUP (FSG) Sand

**FSG No.:** G066XY300NE

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



### Physiographic Features

Soils in the Sand group are found on upland slopes, terraces, and flood plains.

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	1970	2950
<b>Slope (percent):</b>	0	15
<b>Flooding:</b>		
<b>Frequency:</b>	None	Frequent
<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>	Negligible	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 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.

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>First Killing Freeze in Fall (28 deg):</b> (1 year in 10 earlier than)	Sep 11	Sep 26

	<b>From</b>	<b>To</b>
<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>	<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>	0.08	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

<b><u>Climate Station</u></b>	<b><u>Location</u></b>	<b><u>From</u></b>	<b><u>To</u></b>
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**

This group consists of moderately deep to very deep, moderately well to excessively drained, coarse textured soils formed from alluvial and eolian sandy materials. Available water capacity mostly is low and permeability is mostly rapid.

<b>Drainage Class:</b>	Moderately well drained	To	Excessively drained
<b>Permeability Class:</b> (0 - 40 inches)	Moderate	To	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	3.0
<b>Electrical Conductivity (mmhos/cm):</b> (0 - 24 inches)	0	2
<b>Sodium Absorption Ratio:</b> (0 - 12 inches)	0	0
<b>Soil Reaction (1:1) Water (pH):</b> (0 - 12 inches)	5.1	8.4
<b>Available Water Capacity (inches):</b> (0 - 60 inches)	3	10
<b>Calcium Carbonate Equivalent (percent):</b> (0 - 12 inches)	0	5

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

Boelus	Hennings	O'Neill	Wewela
Calamus	Inavale	Sandose	
Doger	Ipage	Simeon	
Dunday	Mckelvie	Valentine	

### 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>Dry</u>	<u>Irrig</u>	<u>Legumes</u>	<u>Symbol</u>	<u>Dry</u>	<u>Irrig</u>
Crested wheatgrass	AGCR	F	NS	Alfalfa	MESA	G	G
Intermediate wheatgrass	THIN6	F	G	Birdsfoot trefoil	LOCO6	NS	G
Meadow brome	BRBI2	NS	G	Cicer milkvetch	ASCI4	F	F
Orchardgrass	DAGL	NS	G	Illinois bundleflower	DEIL	F	NS
Pubescent wheatgrass	THIN6	F	G	Purple prairieclover	DAPUP	F	NS
Smooth brome	BRINI2	F	G	Red clover	TRPR2	NS	G
Western wheatgrass	PASM	F	NS				
<u>Warm Season Grasses</u>	<u>Symbol</u>	<u>Dry</u>	<u>Irrig</u>				
Big bluestem	ANGE	G	G				
Indiangrass	SONU2	G	G				
Little bluestem	SCSC	G	NS				
Prairie sandreed	CALO	G	NS				
Sand bluestem	ANHA	G	NS				
Sand lovegrass	ERTR3	F	NS				
Sideoats grama	BOCU	F	NS				
Switchgrass	PAVIV	G	G				

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	<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	5100	3100		
Alfalfa/Intermediate wheatgrass	4000	2600	14300	8600
Alfalfa/Smooth brome	4000	2600	14300	8600
Indiangrass	4000	2300		
Intermediate wheatgrass	2900	2000	11400	6900
Sand bluestem	5100	2900		
Smooth brome	3400	2000	11400	6900
Switchgrass	5100	2900		

### 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

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

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

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

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

### Soil Limitations

Soil blowing is a severe hazard during stand establishment or renovation of forage stands on the soils of this group. Bare areas where livestock concentrate are also susceptible. Production potential is low to moderate due to the low available water capacity and droughtiness of these soils. Also, these soils are typically low in native fertility and have reduced capacity to supply plant nutrients. Species choices are somewhat limited for pasture and hayland for these same reasons.

### Management Interpretations

The impact on yields of the low available water capacity of these soils can be reduced by selecting forage species that are highly tolerant to periods of drought and inadequate soil moisture and can grow on coarse soils. Incorporate wind erosion control practices during stand establishment. Properly locating facilitating practices such as fences, lanes, and water developments can help control livestock movement, reduce trailing perpendicular to steeper slopes, evenly distribute grazing pressure, and reduce bare areas.

### FSG Documentation

**Similar FSG's:**

**FSG ID**  
G066XY130N

**FSG Narrative**

Very Droughty Loam soils have finer textures than sands.

**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: Dave Schmidt  
Approval Date: 9/20/04