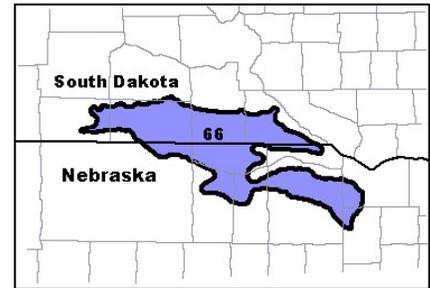


## FORAGE SUITABILITY GROUP (FSG) Droughty Loam

**FSG No.:** G066XY120NE

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



### Physiographic Features

Droughty Loam soils are found on upland slopes, stream 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	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**

This group consists of deep an very deep, mostly well drained, medium to moderately coarse textured soils. Available water capacity is moderate due to the moderately coarse surface textures or moderate depths to sand and gravel.

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

	<u>Minimum</u>	<u>Maximum</u>
<b>Depth:</b>	40	
<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	2
<b>Sodium Absorption Ratio:</b> (0 - 12 inches)	0	9
<b>Soil Reaction (1:1) Water (pH):</b> (0 - 12 inches)	5.1	8.4
<b>Available Water Capacity (inches):</b> (0 - 60 inches)	5	9
<b>Calcium Carbonate Equivalent (percent):</b> (0 - 12 inches)	0	6

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

Anselmo	Hennings	Jansen	Tuthill
Brocksburg	Holt variant	Manter	
Cass	Inavale	Munjor	

### 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>Warm Season Grasses</u>	<u>Symbol</u>	<u>Dry</u>	<u>Irrig</u>
Crested wheatgrass	AGCR	G	NS	Big bluestem	ANGE	G	G
Green needlegrass	NAVI4	G	NS	Indiangrass	SONU2	F	G
Intermediate wheatgrass	THIN6	G	G	Little bluestem	SCSC	G	NS
Meadow brome	BRBI2	G	G	Prairie sandreed	CALO	F	NS
Orchardgrass	DAGL	F	G	Sand bluestem	ANHA	F	NS
Pubescent wheatgrass	THIN6	G	G	Sideoats grama	BOCU	G	NS
Russian wildrye	PSJU3	G	NS	Switchgrass	PAVIV	F	G
Smooth brome	BRINI2	G	G	<u>Legumes</u>	<u>Symbol</u>	<u>Dry</u>	<u>Irrig</u>
Tall wheatgrass	THPO7	F	NS	Alfalfa	MESA	G	G
Western wheatgrass	PASM	G	NS	Birdsfoot trefoil	LOCO6	NS	G
				Cicer milkvetch	ASCI4	G	F
				Purple prairieclover	DAPUP	G	NS
				Red clover	TRPR2	F	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. 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>	
	<u>Management Intensity</u>		<u>Management Intensity</u>	
	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)
Alfalfa	6900	2900		
Alfalfa/Intermediate wheatgrass	6000	2600	14300	8600
Alfalfa/Smooth brome	6000	2600	14300	8600
Intermediate wheatgrass	4300	2300	11400	6900
Smooth brome	4000	2300	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:** 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

The primary limitation for these soils is their moderate available water capacity which limits plant growth during periods of moisture deficit. On steeper slopes, water erosion is a potential problem during stand establishment, and livestock trail erosion is a potential problem on established stands. Also, wind erosion is a potential problem during stand establishment on moderately coarse textured soils.

### Management Interpretations

The impact on yields of the moderate available water capacity of these soils can be reduced by selecting forage species that are tolerant to periods of drought and inadequate soil moisture. 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 FSG's:**

<b><u>FSG ID</u></b>	<b><u>FSG Narrative</u></b>
G066XY100N	Loamy soils have greater available water capacity and greater production potential.
G066XY130N	Very Droughty Loams have lower available water capacity and lower 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 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