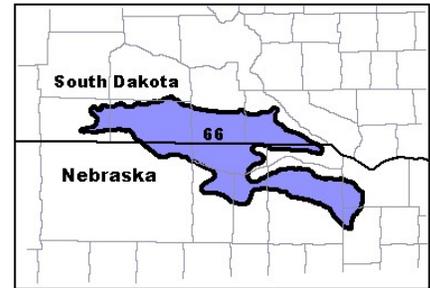


FORAGE SUITABILITY GROUP (FSG) Very Droughty Loam

FSG No.: G066XY130NE

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



Physiographic Features

These soils are found on upland slopes, terraces, foot slopes, and alluvial fans.

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1970	2950
Slope (percent):	0	9
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Negligible	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 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.

	From	To
Freeze-free period (28 deg)(days): (9 years in 10 at least)	120	150
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)	May 23	May 08
Last Frost in Spring (32 deg): (1 year in 10 later than)	Jun 01	May 20
First Frost in Fall (32 deg): (1 year in 10 earlier than)	Sep 07	Sep 17
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	Sep 11	Sep 26

	From	To
Length of Growing Season (32 deg)(days): (9 years in 10 at least)	104	130
Growing Degree Days (40 deg):	4580	5148
Growing Degree Days (50 deg):	2615	3038
Annual Minimum Temperature:	-25	-15
Mean annual precipitation (inches):	18	25

Monthly precipitation (inches) and temperature (F):

2 years in 10:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Precip. Less Than	0.08	0.11	0.33	0.62	1.70	1.51	1.54	0.91	0.65	0.53	0.15	0.16
Precip. More Than	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:	0.34	0.49	1.42	2.16	3.40	3.46	3.07	2.22	2.15	1.32	0.71	0.52
Temp. Min.	7.1	12.4	20.8	31.7	42.4	52.3	58.5	55.8	45.2	33.5	20.7	10.0
Temp. Max.	30.3	36.2	46.8	62.1	72.9	82.8	88.7	86.5	76.2	64.5	46.4	33.3
Temp. Avg.	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 mostly of well drained, moderately deep to very deep, medium to moderately coarse textured soils. The deeper soils are underlain with sand and gravel. Available water holding capacity is low.

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

	<u>Minimum</u>	<u>Maximum</u>
Depth:	20	
Surface Fragments >3" (% Cover):	0	3
Organic Matter (percent): (surface layer)	0.5	4.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	0	2
Sodium Absorption Ratio: (0 - 12 inches)	0	9
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	5.1	8.4
Available Water Capacity (inches): (0 - 60 inches)	3	6
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	8

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

Brunswick	Dunday	Meadin	Ronson
Chappell	Holt	O'Neill	Wewela
Dix	Holt variant	Pivot	

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	F	G
Green needlegrass	NAVI4	G	NS	Indiangrass	SONU2	NS	G
Intermediate wheatgrass	THIN6	F	G	Little bluestem	SCSC	G	NS
Meadow brome	BRBI2	F	G	Sideoats grama	BOCU	G	NS
Orchardgrass	DAGL	NS	G	Switchgrass	PAVIV	NS	G
Pubescent wheatgrass	THIN6	G	G	<u>Legumes</u>	<u>Symbol</u>	<u>Dry</u>	<u>Irrig</u>
Russian wildrye	PSJU3	G	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. 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	4300	2300		
Alfalfa/Intermediate wheatgrass	3400	2000	14300	7700
Alfalfa/Smooth brome	3400	2000	14300	7700
Intermediate wheatgrass	2900	1400	11400	6300
Smooth brome	2900	1400	11400	6300

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

<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, statewide

<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, statewide

<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, statewide

<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 for these soils is their moderate depth to bedrock or sand and gravel and resulting low available water capacity which limits species selection and production potential. On steeper slopes, water erosion is a potential problem during establishment, when renovating stands, and in thin established stands. Livestock trail erosion is a potential problem on established stands. Also, wind erosion is a potential problem during stand establishment.

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. 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:

FSG ID

G066XY120N

FSG Narrative

Droughty Loam soils have higher available water capacity and greater 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