

FORAGE SUITABILITY GROUP (FSG)

Very Droughty Loam

FSG No.: G058DY130SD

Major Land Resource Area (MLRA): 058D - Northern Rolling High Plains, Eastern Part

Physiographic Features

The soils in the Very Droughty Loam group are found on uplands.

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	2300	3300
Slope (percent):	0	9
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Low	High



Climatic Features

This group occurs in a mid-continental climate characterized by wide seasonal temperature and precipitation fluctuations and extremes.

Average annual precipitation for all climate stations in MLRA 58D listed below is about 16 inches. Although average annual precipitation is low, about 80 percent occurs during the growing season months of April through September. On average, there are about 25 days with greater than .1 inches of precipitation during that same time period.

Average annual snowfall ranges from 25 inches at Amidon, North Dakota (ND), to 46 inches at Redig, South Dakota (SD). Days with insulating snow cover at depths greater than 1 inch range from 22 at Ludlow, SD, to 81 at Bowman, ND.

Average July temperatures across the MLRA are about 70°F and average January temperatures are about 15°F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -46°F recorded at Camp Crook, SD, and a high of 115 recorded at Ludlow, SD. The MLRA lies mostly in USDA Plant Hardiness Zones 4a with a small area of colder 3b on the western edge of Harding County in South Dakota.

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>.

	From	To
Freeze-free period (28 deg)(days): (9 years in 10 at least)	107	131
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)	May 25	May 15
Last Frost in Spring (32 deg): (1 year in 10 later than)	Jun 19	May 28
First Frost in Fall (32 deg): (1 year in 10 earlier than)	Aug 26	Sep 06
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	Sep 02	Sep 16

	From	To
Length of Growing Season (32 deg)(days): (9 years in 10 at least)	80	110
Growing Degree Days (40 deg):	3815	4091
Growing Degree Days (50 deg):	2250	2108
Annual Minimum Temperature:	-35	-25
Mean annual precipitation (inches):	14	16

Monthly precipitation (inches) and temperature (F):

2 years in 10:	<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>
Precip. Less Than	0.07	0.12	0.24	0.45	1.18	1.52	0.64	0.45	0.36	0.31	0.14	0.14
Precip. More Than	0.57	0.44	1.18	2.99	4.25	4.70	2.84	2.10	2.31	1.71	0.86	0.74
Monthly Average:	0.34	0.32	0.64	1.65	2.79	3.20	2.03	1.36	1.35	0.98	0.44	0.41
Temp. Min.	2.8	8.5	18.3	29.3	40.1	49.2	54.3	51.7	40.2	29.8	16.8	5.8
Temp. Max.	29.4	35.2	44.7	58.6	68.9	79.1	88.0	87.4	75.6	62.8	44.2	31.8
Temp. Avg.	15.5	21.1	30.5	43.1	54.1	63.7	70.5	69.0	57.4	46.2	30.7	18.7

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
SD1294	Camp Crook, SD	1961	1990
SD5048	Ludlow, SD	1961	1990
SD6907	Ralph, SD	1961	1990
SD7062	Redig, SD	1961	1990
ND0209	Amidon, ND	1961	1990
ND0995	Bowman, ND	1961	1990

Soil Interpretations

This group consists of moderately deep, well drained, moderately coarse textured soil formed in materials deposited by wind or weathered from soft sandstone. Permeability is moderately slow to moderate, and available water capacity is low.

Drainage Class:	Well drained	To	Well drained
Permeability Class: (0 - 40 inches)	Moderately slow	To	Moderate
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)	1.0	3.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	0	2
Sodium Absorption Ratio: (0 - 12 inches)	0	0
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	6.1	7.8
Available Water Capacity (inches): (0 - 60 inches)	3	5
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	9

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>.

Cool Season Grasses	<u>Symbol</u>		Warm Season Grasses	<u>Symbol</u>	
Altai wildrye	LEAN3	F	Little bluestem	SCSC	G
Basin wildrye	LECI4	F	Prairie sandreed	CALO	F
Crested wheatgrass	AGCR	G	Sand bluestem	ANHA	F
Green needlegrass	NAVI4	F	Sideoats grama	BOCU	G
Pubescent wheatgrass	THIN6	F	Legumes	<u>Symbol</u>	
Russian wildrye	PSJU3	G	Alfalfa	MESA	G
Streambank wheatgrass	ELLAL	G	Cicer milkvetch	ASCI4	G
Thickspike wheatgrass	ELMA7	G	Purple prairieclover	DAPUP	G
Western wheatgrass	PASM	G	Sainfoin	ONVI	F
			White prairieclover	DACAC	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

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. Seventy 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>	
	Management Intensity	
	<u>Low</u>	<u>High</u>
	(lbs/ac)	(lbs/ac)
Alfalfa	1400	2600
Alfalfa/Crested wheatgrass	1400	2300
Alfalfa/Pubescent wheatgrass	1400	2300
Crested wheatgrass	900	1700
Pubescent wheatgrass	900	1700

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: ND0001
Growth Curve Name: Alfalfa
Growth Curve Description: Alfalfa

<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	30	20	15	5	0	0	0

Growth Curve Number: ND0002
Growth Curve Name: Cool season grass
Growth Curve Description: Cool season grass

<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	40	35	10	5	5	0	0	0

Growth Curve Number: ND0003
Growth Curve Name: Warm season grass
Growth Curve Description: Warm season grass

<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

Soil Limitations

The primary limitation for these soils is their moderate depth to bed rock 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 on moderately coarse textured soils.

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.

Pasture and hayland can include considerations for wildlife. Delaying grazing on portions of the pasture or rotating pastures will allow nest initiation of grassland nesting birds or species of concern. Nest initiation of most grassland nesting birds occurs from April 15 to June 1. Delaying haying until after July 15 allows for most species to fledge their young. Consider planting species with later maturity to allow for harvesting after nests have fledged. Avoid mowing around the field. Mow back and forth or from the inside to the outside of the field. Consider using flushing bars on swathers and mowers.

FSG Documentation

Similar FSG's:
FSG ID
 G058DY120SD

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 North Dakota counties in MLRA 58D
NRCS North Dakota Field Office Technical Guide and South Dakota Technical Guide
NRCS National Range and Pasture Handbook
Various South Dakota and North Dakota 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: North Dakota and South Dakota

Forage Suitability Group Approval:

Original Author: Tim Nordquist
Original Date: 4/17/2002
Approval by: Dave Schmidt
Approval Date: 9/15/04