

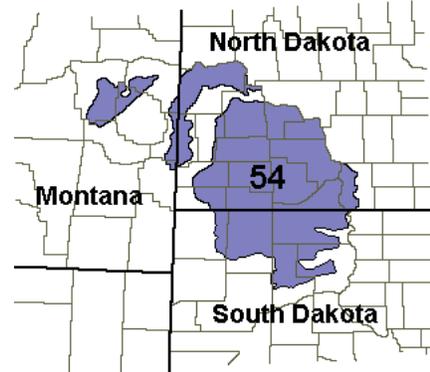
FORAGE SUITABILITY GROUP Subirrigated

FSG No.: G054XY700ND

Major Land Resource Area: 54 - Rolling Soft Shale Plain

Physiographic Features

The soils in this group are found on lake plains, and surrounding shallow depressions and on slight rises on till plains. They may also occur on alluvial flats.



	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1600	3600
Slope (percent):	0	3
Flooding:		
Frequency:	None	Occasional
Duration:	None	Brief
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Negligible	Low

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 54. Average annual precipitation for all climate stations listed below is about 17 inches. About 78 percent of that occurs during the months of April through September. On average there are about 25 days with greater than .1 inches of precipitation during the 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 23 inches at McLaughlin, SD to 48 inches at Glad Valley, SD. Snow cover at depths greater than 1 inch range from 20 days at Bison, SD to 92 days at Hebron, ND.

Average July temperatures are about 71 degrees F., and average January temperatures are about 13 degrees F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -49 degrees at Breien, ND, and a high of 111 recorded at Hettinger, ND. The MLRA lies in USDA Plant Hardiness Zones 3b, 4a, and 4B.

At Bismarck, the closest station with such records, the average morning relative humidity in June is about 84 percent and average afternoon humidity is 55 percent. It is cloudy an average of 165 days a year.

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>.

Freeze-free period (28 deg)(days): (9 years in 10 at least)	From 108	To 140
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)	May 31	May 12
Last Frost in Spring (32 deg): (1 year in 10 later than)	Jun 07	May 23
First Frost in Fall (32 deg): (1 year in 10 earlier than)	Aug 29	Sep 11
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	Sep 07	Sep 23
Length of Growing Season (32 deg)(days): (9 years in 10 at least)	93	122
Growing Degree Days (40 deg):	3774	4647
Growing Degree Days (50 deg):	2033	2700
Annual Minimum Temperature:	-35	-20
Mean annual precipitation (inches):	16	18

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	0.12	0.10	0.32	0.56	1.08	1.75	0.92	0.76	0.37	0.22	0.13	0.16
Precip. More Than	0.80	0.80	1.61	3.17	4.32	4.95	3.48	2.76	2.29	1.72	0.91	0.96
Monthly Average:	0.33	0.36	0.81	1.90	2.66	3.22	2.19	1.68	1.45	1.00	0.74	0.41
Temp. Min.	-2.0	4.4	16.0	28.7	40.2	50.1	54.6	52.2	41.4	31.0	16.8	3.0
Temp. Max.	27.2	32.9	43.3	58.9	70.8	80.7	89.2	88.1	76.2	63.4	44.0	29.9
Temp. Avg.	12.7	18.5	29.2	43.4	55.1	64.9	71.3	69.5	57.9	46.4	30.1	16.5

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
ND0766	Beulah, ND	1961	1990
ND1052	Breien, ND	1961	1990
ND1370	Carson, ND	1961	1990
ND2183	Dickinson, ND	1961	1990
ND2365	Dunn Center, ND	1961	1990
ND4102	Hebron, ND	1964	1990
ND4178	Hettinger, ND	1961	1990
ND5479	Mandan Exp Station, ND	1961	1990
SD0701	Bison, SD	1961	1990
SD2429	Dupree, SD	1961	1990
SD2852	Faith, SD	1961	1990
SD3316	Glad Valley, SD	1961	1990
SD4864	Lemmon, SD	1961	1990
SD5046	McLaughlin, SD	1961	1990
SD5381	McIntosh, SD	1961	1990
SD8528	Usta, SD	1961	1990

Soil Interpretations

The soils in this group are medium textured and somewhat poorly drained. They have a seasonal water table within 12 to 48 inches of the surface during part of the growing season.

Drainage Class:	Somewhat poorly drained	To	Somewhat poorly drained
Permeability Class: (0 - 40 inches)	Moderately slow	To	Moderate
Frost Action Class:	Moderate	To	High

	<u>Minimum</u>	<u>Maximum</u>
Depth:	72	
Surface Fragments >3" (% Cover):	0	0
Organic Matter (percent): (surface layer)	0.5	7.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches) (0 - 12 inches)	0	8
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	6.6	8.4
Available Water Capacity (inches): (0 - 60 inches)	9	12
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	25

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 at <http://plants.usda.gov/>

<u>Cool Season Grasses</u>	<u>Symbol</u>	<u>Adapted</u>	<u>Legumes</u>	<u>Symbol</u>	<u>Adapted</u>
Canada wildrye	ELCA4	F	Alfalfa	MESA	G
Crested wheatgrass	AGCR	G	American vetch	VIAM	F
Green needlegrass	NAVI4	F	Canada milkvetch	ASCAC6	F
Intermediate wheatgrass	THIN6	F	Cicer milkvetch	ASCI4	F
Newhy hybrid wheatgrass		F	Hairy vetch	VIVI	F
Meadow brome grass	BRBI2	F	Sweetclover	MELIL	G
Pubescent wheatgrass	THIN6	F			
Russian wildrye	PSJU3	F			
Slender wheatgrass	ELTR7	G			
Smooth brome grass	BRINI2	F			
Tall wheatgrass	THPO7	G			
Western wheatgrass	PASM	G			
<u>Warm Season Grasses</u>					
Big bluestem	ANGE	G			
Little bluestem	SCSC	G			
Switchgrass	PAVIV	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. On site 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	Management Intensity	
	High (lbs/ac)	Low (lbs/ac)
Alfalfa	8500	3700
Alfalfa/Intermediate wheatgrass	7400	3000
Alfalfa/Smooth brome grass	7400	3000
Big bluestem	6600	2900
Creeping foxtail	6000	3400
Indiangrass	5000	2500
Intermediate wheatgrass	6000	2600
Reed canarygrass	8200	4900
Smooth brome grass	6000	2600
Switchgrass	7100	3300

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

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. Due to the dominant upward movement of water these soils may become saline. A number of them 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. Coarser textured soils in this group may be subject to soil blowing when establishing new stands.

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. On coarser textured soils incorporate wind erosion control practices during stand establishment.

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 FSGs:

FSG ID

G054XY500SD

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 (NASIS) for soil surveys in North Dakota, South Dakota, and Montana counties in MLRA 54
- North Dakota, South Dakota, and Montana NRCS Field Office Technical Guides
- NRCS National Range and Pasture Handbook
- Various 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:

MT

ND

SD

Forage Suitability Group Approval:

Original Author: Tim Nordquist

Original Date: 2/25/03

Approval by: Jeff Prinz

Approval Date: