

FORAGE SUITABILITY GROUP

Saline

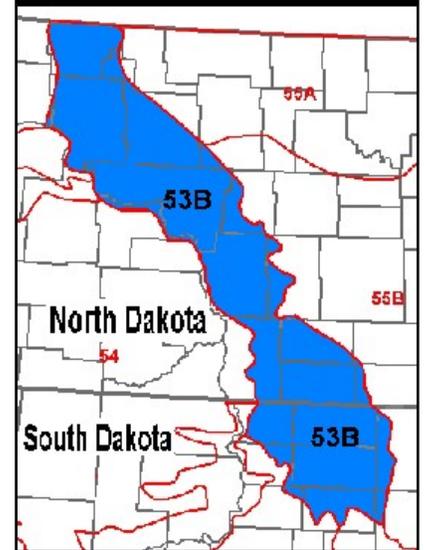
FSG No.: G053BY895ND

Major Land Resource Area (MLRA): 53B - Central Dark Brown Glaciated Plains

Physiographic Features

This group is located on flood plains with high water tables.

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1640	1970
Slope (percent):	0	1
Flooding:		
Frequency:	Frequent	Frequent
Duration:	Brief	Brief
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	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 53B. Average annual precipitation for all climate stations listed below is about 17 inches. About 79 percent of that occurs during the months of April through September. On average, there are about 27 days with greater than .1 inches of precipitation during the same timeframe.

Average annual snowfall ranges from 21 inches at Turtle Lake, North Dakota (ND), to 38 inches at Eureka, South Dakota (SD). Days with snow cover at depths greater than 1 inch range from 22 at Garrison, ND, to 100 at Max, ND.

Average July temperatures are about 70°F and average January temperatures are about 8°F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -48°F at Powers Lake, ND, and a high of 111 recorded at Linton, ND. The MLRA lies in USDA Plant Hardiness Zones 3b and 4a.

At Bismarck, 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>.

	From	To
Freeze-free period (28 deg) (days): (9 years in 10 at least)	100	134
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)	Jun 06	May 16
Last Frost in Spring (32 deg): (1 year in 10 later than)	Jun 18	May 26

	From	To
First Frost in Fall (32 deg): (1 year in 10 earlier than)	Aug 23	Sep 12
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	Sep 02	Sep 19
Length of Growing Season (32 deg) (days): (9 years in 10 at least)	78	116
Growing Degree Days (40 deg):	3317	4367
Growing Degree Days (50 deg):	1793	2441
Annual Minimum Temperature:	-35	-25
Mean annual precipitation (inches):	15	19

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	0.17	0.14	0.26	0.37	0.95	1.79	0.86	0.65	0.65	0.22	0.13	0.23
Precip. More Than	0.63	0.80	1.96	3.53	3.81	4.82	3.82	2.89	2.63	1.66	1.07	0.70
Monthly Average:	0.42	0.42	0.82	1.80	2.30	3.21	2.49	1.96	1.69	0.98	0.46	0.43
Temp. Min.	-1.5	4.9	18.8	31.6	43.3	53.4	58.8	55.4	44.1	32.5	18.7	4.1
Temp. Max.	30.6	36.4	47.0	62.4	73.4	83.0	90.4	88.6	78.2	65.5	46.7	33.4
Temp. Avg.	8.0	14.3	26.6	42.2	54.8	64.3	70.2	68.2	56.8	45.2	27.8	13.1

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
ND0961	Bowbells, ND	1961	1990
ND7281	Powers Lake, ND	1961	1990
ND1225	Butte, ND	1961	1990
ND3376	Garrison, ND	1961	1990
ND5638	Max, ND	1961	1990
ND8804	Turtle Lake, ND	1961	1990
ND8872	Underwood, ND	1961	1990
ND0382	Ashley, ND	1961	1990
ND9515	Wishek, ND	1961	1990
ND5210	Linton, ND	1961	1990
SD2797	Eureka, SD	1961	1990
SD4891	Leola, SD	1961	1990
SD4206	Ipswich, SD	1961	1990

Soil Interpretations

This group consists of poorly drained soils with elevated salinity.

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

	<u>Minimum</u>	<u>Maximum</u>
Depth:	72	
Surface Fragments >3" (% Cover):	0	3
Organic Matter (percent): (surface layer)	3.0	6.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	16	16
Sodium Absorption Ratio: (0 - 12 inches)	7	7
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	6.6	8.4

	<u>Minimum</u>	<u>Maximum</u>
Available Water Capacity (inches): (0 - 60 inches)	11	11
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	5

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>Warm Season Grasses</u>	<u>Symbol</u>	<u>Adapted</u>
Altai wildrye	LEAN3	F	Switchgrass	PAVIV	F
Beardless wildrye	LETR5	G	<u>Legumes</u>		
Canada wildrye	ELCA4	F	Alsike clover	TRHY	F
Creeping foxtail	ALAR	F	Sweetclover	MELIL	F
Newhy hybrid wheatgrass		G			
Russian wildrye	PSJU3	F			
Slender wheatgrass	ELTR7	G			
Tall wheatgrass	THPO7	G			
Western wheatgrass	PASM	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 predicted 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	Management Intensity	
	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)
Tall wheatgrass	4900	2600
Western wheatgrass	3400	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: 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 severe limitations to the production of climatically adapted forage species. Species selection and productivity are severely limited by the high salinity levels. Also, these soils are poorly drained and will experience periods when trafficability will be difficult or impossible. These soils are subject to compaction if grazed or machinery is operated on them when wet. Drainage also limits species selection.

Management Interpretations

When establishing new stands or renovating stands select species that are tolerant of elevated salinity and sodium levels, and that are tolerant of somewhat poorly and poorly drained soils. Exclude livestock and machinery during extended periods of soil wetness to reduce soil compaction.

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:

<u>FSG ID</u>	<u>FSG Narrative</u>
G053BY700ND	Subirrigated soils do not have restrictive levels of salinity and/or sodium.
G053BY800ND	Claypan soils have better drainage.
G053BY900ND	Wet soils do not have restrictive levels of salinity and/or sodium.

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 North Dakota and South Dakota counties in MLRA 53B
- NRCS North Dakota Field Office Technical Guide and South Dakota Technical Guide
- 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: North and South Dakota

Forage Suitability Group Approval:

Original Author: Tim Nordquist

Original Date: 1/10/05

Approval by: Dave Schmidt

Approval Date: 1/10/05