

FORAGE SUITABILITY GROUP SUBIRRIGATED

FSG No.: G056XY700ND

Major Land Resource Area: 056X - Red River Valley of the North

Physiographic Features

The soils in this group are found on level and nearly level glacial lake, outwash, till, and flood plains, and on terraces and interbeach areas. They can also occur in swales and depressions of upland areas.



	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	660	1000
Slope (percent):	0	6
Flooding:		
Frequency:	None	Occasional
Duration:	None	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 56. Average annual precipitation for all climate stations listed below is about 20 inches. About 70 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 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 21 inches at Grafton, ND to 47 inches at Fargo, ND. Snow cover at depths greater than 1 inch range from 33 days at Grafton, ND to 124 days at Cavalier, ND.

Average July temperatures are about 70 degrees F., and average January temperatures are about 6 degrees F. Recorded temperature extremes in the MLRA during the years 1971 to 2000 are a low of -41 at McLeod, and a high of 107 recorded at both Colgate and Wapheton. The MLRA lies in USDA Plant Hardiness Zones 3b and 4a.

At Fargo, ND the average annual wind speed is about 12 MPH. The highest wind speeds occur during early spring and the lowest occur during the summer. It is cloudy about 165 days a year. Average morning relative humidity in June is about 82 percent and average afternoon humidity is about 59 percent.

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)	126	141
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)	May 24	May 14
Last Frost in Spring (32 deg): (1 year in 10 later than)	Jun 05	May 21
First Frost in Fall (32 deg): (1 year in 10 earlier than)	Aug 27	Sep 18
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	Sep 11	Sep 25
Length of Growing Season (32 deg)(days): (9 years in 10 at least)	104	129
Growing Degree Days (40 deg):	3550	4444
Growing Degree Days (50 deg):	1968	2524
Annual Minimum Temperature:	-35	-25
Mean annual precipitation (inches):	18	22

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	0.20	0.20	0.40	0.40	1.20	1.60	1.50	1.40	0.80	0.30	0.20	0.10
Precip. More Than	0.90	0.80	1.40	2.20	3.60	4.80	4.70	3.70	3.20	2.90	1.50	0.70
Monthly Average:	0.60	0.50	0.90	1.30	2.40	3.30	3.20	2.60	2.00	1.70	0.90	0.40
Temp. Min.	-3.5	3.9	17.3	31.0	44.1	53.4	57.6	55.4	45.2	33.7	18.0	3.4
Temp. Max.	15.4	22.8	34.9	54.2	70.1	77.8	82.0	81.1	70.3	56.1	34.8	20.7
Temp. Avg.	6.0	13.3	26.1	42.6	57.1	65.6	69.8	68.3	57.8	44.9	26.4	12.0

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
ND5754	MC LEOD, ND	1971	2000
ND9100	WAHPETON, ND	1971	1999
ND1686	COLGATE, ND	1971	2000
ND2859	FARGO, ND	1971	2000
ND4203	HILLSBORO, ND	1971	2000
ND3616	GRAND FORKS, ND	1971	2000
ND5013	LARIMORE, ND	1971	2000
ND3594	GRAFTON, ND	1971	2000
ND1435	CAVALIER, ND	1971	2000

Soil Interpretations

The soils in this group are moderately fine to coarse textured and mostly somewhat poorly drained. They have a seasonal water table within 18 to 48 inches of the surface during part of the growing season.

Drainage Class:	Poorly drained	To	Moderately well drained
Permeability Class: (0 - 40 inches)	Slow	To	Rapid
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)	1.0	9.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	0	8

	<u>Minimum</u>	<u>Maximum</u>
Sodium Absorption Ratio: (0 - 12 inches)	0	3
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	6.1	8.4
Available Water Capacity (inches): (0 - 60 inches)	5	12
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	28

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	Big bluestem	ANGE	G
Bluebunch/Quackgrass Hybrid		G	Indiangrass	SONU2	G
Canada wildrye	ELCA4	F	Little bluestem	SCSC	G
Creeping foxtail	ALAR	F	Switchgrass	PAVIV	G
Dahurian wildrye	ELDA3	F			
Green needlegrass	NAVI4	F	Legumes	<u>Symbol</u>	
Intermediate wheatgrass	THIN6	F	Alfalfa	MESA	F
Meadow bromegrass	BRBI2	G	Alsike clover	TRHY	F
Pubescent wheatgrass	THIN6	F	Birdsfoot trefoil	LOCO6	G
Reed canarygrass	PHAR3	G	Canada milkvetch	ASCAC6	F
Slender wheatgrass	ELTR7	G	Cicer milkvetch	ASCI4	F
Smooth bromegrass	BRINI2	G	Hairy vetch	VIVI	F
Tall wheatgrass	THPO7	G	Sweet clover	MELIL	G
Western wheatgrass	PASM	G	White clover	TRRE3	F

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	<u>Dryland</u>	
	Management Intensity	
	<u>Low</u> (lbs/ac)	<u>High</u> (lbs/ac)
Alfalfa	5800	11800
Alfalfa/Intermediate wheatgrass	5000	10400
Alfalfa/Smooth brome	5000	10400
Big bluestem	5000	10000
Creeping foxtail	5400	9300
Indiangrass	4300	7800
Intermediate wheatgrass	3900	9600
Reed canarygrass	7500	12900
Smooth brome	3900	9600
Switchgrass	5400	12100

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

G056XY500ND

FSG Narrative

Overflow soils do not have watertables within 18-48 inches of 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 Minnesota counties in MLRA 56
- North Dakota NRCS Field Office Technical Guide, South Dakota NRCS Field Office Technical Guide and Minnesota NRCS Field Office 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: ND, SD, MN

Forage Suitability Group Approval:

Original Author: Tim Nordquist

Original Date: 3/19/2000

Approval by: Jeff Printz

Approval Date: March 2005