

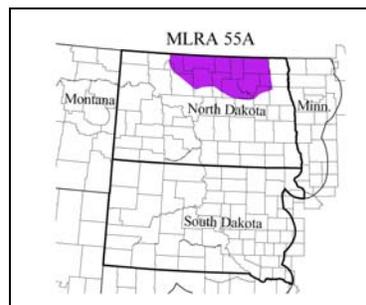
## FORAGE SUITABILITY GROUP VERY SHALLOW TO GRAVEL

**FSG No.:** G055AY003ND

**Major Land Resource Area:** 55A - Northern Black Glaciated Plains

### Physiographic Features

The soils in this group are found on level to moderately sloping positions on glacial lake and outwash plains, deltas, eskers, kames, terraces, beach ridges, and moranes.



	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	980	2300
<b>Slope (percent):</b>	0	6
<b>Flooding:</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Ponding:</b>		
<b>Depth (inches):</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	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 55A. Average annual precipitation for all climate stations listed below is about 17.5 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 time frame.

Average annual snowfall ranges from 26 inches at Hannah, ND to 44 inches at Belcourt Keya, ND. Days with snow cover at depths greater than 1 inch range from 64 days at Velva, ND to 123 days at Hannah, ND.

Average July temperatures are about 68 degrees F., and average January temperatures are about 3 degrees F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -39 at both Petersburg and Oakes in ND, and a high of 108 recorded at both Granville and Velva. The MLRA lies in USDA Plant Hardiness Zones 3A and 3b.

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>.

	<b>From</b>	<b>To</b>
<b>Freeze-free period (28 deg)(days):</b> (9 years in 10 at least)	101	128
<b>Last Killing Freeze in Spring (28 deg):</b> (1 year in 10 later than)	Jun 03	May 19
<b>Last Frost in Spring (32 deg):</b> (1 year in 10 later than)	Jun 22	May 29

	<b>From</b>	<b>To</b>
<b>First Frost in Fall (32 deg):</b> (1 year in 10 earlier than)	Aug 21	Sep 11
<b>First Killing Freeze in Fall (28 deg):</b> (1 year in 10 earlier than)	Sep 04	Sep 18
<b>Length of Growing Season (32 deg)(days):</b> (9 years in 10 at least)	64	104
<b>Growing Degree Days (40 deg):</b>	3022	3776
<b>Growing Degree Days (50 deg):</b>	1541	2129
<b>Annual Minimum Temperature:</b>	-40	-30
<b>Mean annual precipitation (inches):</b>	16	19

**Monthly precipitation (inches) and temperature (F):**

<b>2 years in 10:</b>	<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>
<b>Precip. Less Than</b>	0.23	0.18	0.19	0.48	0.93	1.30	0.96	0.82	0.69	0.38	0.15	0.15
<b>Precip. More Than</b>	0.86	0.81	0.99	2.85	3.64	4.14	4.81	4.11	3.18	2.03	0.78	0.78
<b>Monthly Average:</b>	0.49	0.44	0.68	1.42	2.21	3.00	2.75	2.35	1.95	1.14	0.49	0.50
<b>Temp. Min.</b>	-9.2	-2.5	9.9	25.3	37.5	47.2	52.4	49.7	39.2	29.6	14.2	-2.4
<b>Temp. Max.</b>	17.6	25.6	37.8	55.4	69.3	78.2	84.5	83.5	70.6	59.0	38.3	22.6
<b>Temp. Avg.</b>	3.0	9.3	22.5	39.6	53.1	62.6	67.7	65.7	54.4	43.2	25.1	8.9

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
ND0626	Belcourt, ND	1961	1987
ND2158	Devils Lake, ND	1961	1990
ND2525	Edmore, ND	1961	1990
ND3686	Granville, ND	1961	1990
ND3936	Hannah, ND	1961	1986
ND4958	Langdon Exp. Farm, ND	1961	1990
ND6025	Mohall, ND	1961	1990
ND7664	Rolla, ND	1961	1990
ND8792	Towner, ND	1961	1990
ND8913	Upham, ND	1961	1990
ND8990	Velva, ND	1961	1986

**Soil Interpretations**

This group consists of moderately well to excessively drained, medium to coarse textured soils that are shallow over sand and gravel.

<b>Drainage Class:</b>	Well drained	To	Excessively drained
<b>Permeability Class:</b> (0 - 40 inches)	Moderate	To	Rapid
<b>Frost Action Class:</b>	Low	To	Low

	<u>Minimum</u>	<u>Maximum</u>
<b>Depth:</b>	72	
<b>Surface Fragments &gt;3" (% Cover):</b>	0	3
<b>Organic Matter (percent):</b> (surface layer)	1.0	4.0
<b>Electrical Conductivity (mmhos/cm):</b> (0 - 24 inches)	0	2

	<u>Minimum</u>	<u>Maximum</u>
<b>Sodium Absorption Ratio:</b> (0 - 12 inches)	0	0
<b>Soil Reaction (1:1) Water (pH):</b> (0 - 12 inches)	6.1	8.4
<b>Available Water Capacity (inches):</b> (0 - 60 inches)	3	4
<b>Calcium Carbonate Equivalent (percent):</b> (0 - 12 inches)	0	13

### 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 those species can be accessed at <http://plants.usda.gov/>

<u>Cool Season Grasses</u>	<u>Symbol</u>	<u>Adapted</u>
Bluebunch/Quackgrass Hybrid		F
Crested wheatgrass	AGCR	F
Green needlegrass	NAVI4	F
Intermediate wheatgrass	THIN6	F
Pubescent wheatgrass	THIN6	F
Russian wildrye	PSJU3	F
Slender wheatgrass	ELTR7	F
Smooth bromegrass	BRINI2	F
Western wheatgrass	PASM	F
<u>Warm Season Grasses</u>	<u>Symbol</u>	<u>Adapted</u>
Blue grama	BOGR2	G
Little bluestem	SCSC	G
Prairie sandreed	CALO	G
Sand bluestem	ANHA	F
Sideoats grama	BOCU	F
<u>Legumes</u>	<u>Symbol</u>	<u>Adapted</u>
Purple prairieclover	DAPUP	G
Sweet clover	MELIL	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. 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)
Crested wheatgrass	1400	2900
Pubescent wheatgrass	1700	2900
Western wheatgrass	1100	2000

### 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 low available water capacity due to shallow depth to sand and gravel. This results in severely limited species selection and production potential, and difficulty maintaining vigorous forage stands. Wind and water erosion are potential problems during establishment, when renovating stands, and in thin established stands. Livestock trail erosion is a potential problem on established stands.

### 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.

Where these soils are protected by native or introduced vegetation the existing stand should be managed to maintain or increase vigor. Where these soils are cultivated, returning them to rangeland may be a better alternative than pasture or hayland.

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:**

<b>FSG ID</b>	<b>FSG Narrative</b>
G055AY130ND	Very 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 (NASIS) for soil surveys in North Dakota counties in MLRA 55A
- North Dakota 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: North Dakota

#### **Forage Suitability Group Approval:**

Original Author: Tim Nordquist  
Original Date: 9/3/2003  
Approval by: Jeff Printz  
Approval Date: March 2005