

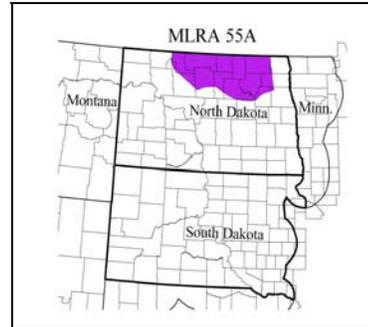
FORAGE SUITABILITY GROUP STEEP LOAM

FSG No.: G055AY109ND

Major Land Resource 055A - Northern Black Glaciated Plains

Physiographic Features

The soils in this group are located on strongly sloping upland positions of till plains and moraines.



| | <u>Minimum</u> | <u>Maximum</u> |
|--------------------------|----------------|----------------|
| Elevation (feet): | 980 | 2300 |
| Slope (percent): | 6 | 25 |
| Flooding: | | |
| Frequency: | None | None |
| Duration: | None | None |
| Ponding: | | |
| Depth (inches): | | |
| Frequency: | None | None |
| Duration: | None | None |
| Runoff Class: | High | Very high |

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. 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 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>.

| | From | To |
|---|-------------|-----------|
| Freeze-free period (28 deg)(days): (9 years in 10 at least) | 101 | 128 |
| Last Killing Freeze in Spring (28 deg): (1 year in 10 later than) | Jun 03 | May 19 |

| | From | To |
|--|-------------|-----------|
| Last Frost in Spring (32 deg): (1 year in 10 later than) | Jun 22 | May 29 |
| First Frost in Fall (32 deg): (1 year in 10 earlier than) | Aug 21 | Sep 11 |
| First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than) | Sep 04 | Sep 18 |
| Length of Growing Season (32 deg)(days): (9 years in 10 at least) | 64 | 104 |
| Growing Degree Days (40 deg): | 3022 | 3776 |
| Growing Degree Days (50 deg): | 1541 | 2129 |
| Annual Minimum Temperature: | -40 | -30 |
| Mean annual precipitation (inches): | 16 | 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 | 0.23 | 0.18 | 0.19 | 0.48 | 0.93 | 1.30 | 0.96 | 0.82 | 0.69 | 0.38 | 0.15 | 0.15 |
| Precip. More Than | 0.86 | 0.81 | 0.99 | 2.85 | 3.64 | 4.14 | 4.81 | 4.11 | 3.18 | 2.03 | 0.78 | 0.78 |
| Monthly Average: | 0.49 | 0.44 | 0.68 | 1.42 | 2.21 | 3.00 | 2.75 | 2.35 | 1.95 | 1.14 | 0.49 | 0.50 |
| Temp. Min. | -9.2 | -2.5 | 9.9 | 25.3 | 37.5 | 47.2 | 52.4 | 49.7 | 39.2 | 29.6 | 14.2 | -2.4 |
| Temp. Max. | 17.6 | 25.6 | 37.8 | 55.4 | 69.3 | 78.2 | 84.5 | 83.5 | 70.6 | 59.0 | 38.3 | 22.6 |
| Temp. Avg. | 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 well drained, moderate textured soils formed mostly in glacial till or alluvium. Available water capacity is high and permeability is moderately slow to moderate.

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

| | <u>Minimum</u> | <u>Maximum</u> |
|---|-----------------------|-----------------------|
| Depth: | 72 | |
| Surface Fragments >3" (% Cover): | 0 | 3 |
| Organic Matter (percent): (surface layer) | 2.0 | 8.0 |
| Electrical Conductivity (mmhos/cm): (0 - 24 inches) | 0 | 4 |

| | <u>Minimum</u> | <u>Maximum</u> |
|---|----------------|----------------|
| Sodium Absorption Ratio: (0 - 12 inches) | 0 | 1 |
| Soil Reaction (1:1) Water (pH): (0 - 12 inches) | 5.6 | 8.4 |
| Available Water Capacity (inches): (0 - 60 inches) | 10 | 11 |
| Calcium Carbonate Equivalent (percent): (0 - 12 inches) | 0 | 20 |

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>Warm Season Grasses</u> | | |
|-----------------------------|---------------|---|----------------------------|---------------|---|
| | <u>Symbol</u> | | | <u>Symbol</u> | |
| Altai wildrye | LEAN3 | F | Big bluestem | ANGE | F |
| Bluebunch/Quackgrass Hybrid | | G | Blue grama | BOGR2 | G |
| Canada wildrye | ELCA4 | F | Indiangrass | SONU2 | F |
| Crested wheatgrass | AGCR | G | Little bluestem | SCSC | G |
| Dahurian wildrye | ELDA3 | G | Prairie sandreed | CALO | F |
| Green needlegrass | NAVI4 | G | Sand bluestem | ANHA | F |
| Intermediate wheatgrass | THIN6 | G | Sideoats grama | BOCU | G |
| Meadow bromegrass | BRBI2 | G | Switchgrass | PAVIV | F |
| Pubescent wheatgrass | THIN6 | G | <u>Legumes</u> | | |
| Russian wildrye | PSJU3 | G | Alfalfa | MESA | G |
| Slender wheatgrass | ELTR7 | G | American vetch | VIAM | F |
| Smooth bromegrass | BRINI2 | G | Birdsfoot trefoil | LOCO6 | F |
| Tall wheatgrass | THPO7 | G | Canada milkvetch | ASCAC6 | F |
| Western wheatgrass | PASM | G | Cicer milkvetch | ASCI4 | G |
| | | | Hairy vetch | VIVI | F |
| | | | Purple prairieclover | DAPUP | G |
| | | | Red clover | TRPR2 | F |
| | | | Sainfoin | ONVI | F |
| | | | Sweet clover | MELIL | G |
| | | | 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) |
| Alfalfa | 3100 | 7100 |
| Alfalfa/Crested wheatgrass | 2400 | 5100 |
| Alfalfa/Intermediate wheatgrass | 2700 | 5400 |
| Alfalfa/Smooth brome grass | 2700 | 5400 |
| Big bluestem | 2500 | 5400 |
| Crested wheatgrass | 2400 | 4800 |
| Green needlegrass | 1700 | 3400 |
| Intermediate wheatgrass | 2500 | 5100 |
| Smooth brome grass | 2500 | 5100 |
| Switchgrass | 2300 | 6300 |
| Western wheatgrass | 1600 | 3400 |

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 slope of these soils range from 6 to 25 percent with high and very high runoff potential, resulting in less of the water entering the soil and being available for plant growth. The potential for water erosion on these steep slopes is high when establishing new stands or renovating stands, and in thin existing stands with exposed bare ground. Livestock trail erosion can be a severe problem. Also, the steep slopes can result in uneven grazing by livestock, and makes travel with wheeled vehicles dangerous.

Management Interpretations

Including sod forming grass species in new seedings will reduce the potential for sheet and rill erosion. Incorporate erosion control practices during the establishment period. Locate facilitating practices such as fences, lanes, and water developments to control livestock movement to more evenly distribute grazing and reduce livestock trailing perpendicular to steeper slopes.

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

G055AY100ND

FSG Narrative

Loamy soils are less steeply sloping.

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