

## FORAGE SUITABILITY GROUP

### Very Droughty Loam

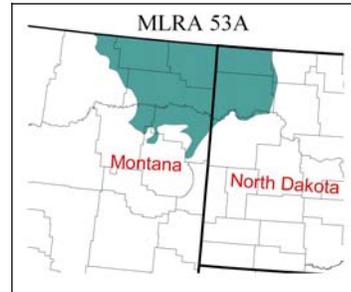
**FSG No.:** G053AY130MT

**Major Land Resource** 053A -Northern Dark Brown Glaciated Plains

#### Physiographic Features

Most of these soils are located on alluvial fans, stream terraces, hills, and outwash plains. Some are found on sedimentary plains and escarpments and other upland positions.

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	2000	3000
<b>Slope (percent):</b>	0	9
<b>Flooding:</b>		
<b>Frequency:</b>	None	Frequent
<b>Duration:</b>	None	Brief
<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 53A. Average annual precipitation for all climate stations listed below is about 13 inches. About 80 percent of that occurs during the months of April through September. On average there are about 22 days with greater than .1 inch of precipitation during the same time frame.

Average annual snowfall ranges from 9 inches at Redstone, MT to 42 inches at Ophiem 16 SE, MT. Snow cover at depths greater than 1 inch range from 16 days at Ophiem 10 N, MT to 97 days at Bredette, MT.

Average July temperatures are about 69 degrees F., and average January temperatures are about 9 degrees F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -52 at Redstone, MT, and a high of 110 at 3 Montana locations. The average dates of last and first frost (32 deg) for the listed stations are May 18 and September 14 for an average growing season length of 118 days. The MLRA lies in USDA Plant Hardiness Zones 3b and 4a.

At Williston, ND the average annual wind speeds are about 10 MPH. The highest wind speeds occur during March through June, but average monthly wind speeds do not vary significantly throughout the year. It is cloudy about 160 days a year with the lowest incidence of cloudiness occurring during the summer months. Average morning relative humidity in June is about 81 percent and average afternoon humidity is 54 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>.

	<b>From</b>	<b>To</b>
<b>Freeze-free period (28 deg)(days):</b> (9 years in 10 at least)	89	139
<b>Last Killing Freeze in Spring (28 deg):</b> (1 year in 10 later than)	Jun 06	May 13
<b>Last Frost in Spring (32 deg):</b> (1 year in 10 later than)	Jun 28	May 27
<b>First Frost in Fall (32 deg):</b> (1 year in 10 earlier than)	Aug 09	Sep 07
<b>First Killing Freeze in Fall (28 deg):</b> (1 year in 10 earlier than)	Aug 23	Sep 15
<b>Length of Growing Season (32 deg)(days):</b> (9 years in 10 at least)	52	126
<b>Growing Degree Days (40 deg):</b>	3216	4334
<b>Growing Degree Days (50 deg):</b>		
<b>Annual Minimum Temperature:</b>	-40	-25
<b>Mean annual precipitation (inches):</b>	12	15

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

<b>2 years in 10:</b>	<b><u>Jan</u></b>	<b><u>Feb</u></b>	<b><u>Mar</u></b>	<b><u>Apr</u></b>	<b><u>May</u></b>	<b><u>Jun</u></b>	<b><u>Jul</u></b>	<b><u>Aug</u></b>	<b><u>Sep</u></b>	<b><u>Oct</u></b>	<b><u>Nov</u></b>	<b><u>Dec</u></b>
<b>Precip. Less Than</b>	0.14	0.10	0.20	0.42	0.90	1.23	0.88	0.48	0.51	0.20	0.13	0.19
<b>Precip. More Than</b>	0.64	0.53	0.82	1.69	3.20	3.55	2.99	2.40	2.12	1.18	0.54	0.65
<b>Monthly Average:</b>	0.39	0.31	0.51	1.10	2.13	2.47	2.02	1.53	1.38	0.69	0.34	0.42
<b>Temp. Min.</b>	-1.8	5.0	16.5	29.5	40.8	49.7	53.9	51.1	40.6	30.2	15.4	3.8
<b>Temp. Max.</b>	19.2	26.5	39.3	55.9	68.5	77.8	84.2	82.3	69.5	56.8	36.8	24.7
<b>Temp. Avg.</b>	8.7	15.8	27.9	42.7	54.7	63.7	69.0	66.7	55.1	43.5	26.1	14.2

<b><u>Climate Station</u></b>	<b><u>Location</u></b>	<b><u>From</u></b>	<b><u>To</u></b>
MT1088	Bredette, MT	1961	1990
MT2122	Culbertson, MT	1961	1990
MT5285	Lustre, MT	1961	1990
MT5572	Medicine Lake 3 SE, MT	1961	1990
MT6236	Ophiem 10 N, MT	1961	1990
MT6238	Ophiem 16 SE, MT	1961	1990
MT6660	Poplar 2E, MT	1961	1990
MT6893	Raymond Border Stn, MT	1961	1990
MT6927	Redstone, MT	1961	1990
MT7424	Scobey, MT	1961	1990
MT8777	Westby, MT	1961	1990
ND1871	Crosby, ND	1961	1990
ND3196	Fortuna, ND	1964	1990
ND3736	Grenora, ND	1961	1990
ND8737	Tioga, ND	1961	1990
ND9400	Wildrose, ND	1961	1990
ND9425	Williston WSO AP, ND	1961	1990
ND9430	Williston Exp Farm, ND	1961	1990

**Soil Interpretations**

This group consists mostly of moderately deep to very deep, well to somewhat excessively drained, moderately coarse to medium textured soils formed from materials overlaying sand and gravel or bedrock at shallow to moderate depth. Available water capacity is low due to the depths to sand and gravel or bedrock.

**Drainage Class:** Moderately well drained To Somewhat excessively drained  
**Permeability Class:** Moderate To Rapid  
 (0 - 40 inches)  
**Frost Action Class:** Low To Moderate

	<u>Minimum</u>	<u>Maximum</u>
<b>Depth (inches):</b>	20	
<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	4
<b>Sodium Absorption Ratio:</b> (0 - 12 inches)	0	0
<b>Soil Reaction (1:1) Water (pH):</b> (0 - 12 inches)	5.6	8.4
<b>Available Water Capacity (inches):</b> (0 - 60 inches)	3	6
<b>Calcium Carbonate Equivalent (percent):</b> (0 - 12 inches)	0	15

### 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/>.

	<u>Symbol</u>	<u>Dryland</u>
<b>Cool Season Grasses</b>		
Bluebunch/Quackgrass Hybrid		F
Crested wheatgrass	AGCR	G
Intermediate wheatgrass	THIN6	F
Meadow brome	BRBI2	F
Pubescent wheatgrass	THIN6	F
Slender wheatgrass	ELTR7	F
Smooth brome	BRINI2	F
Western wheatgrass	PASM	G
<b>Warm Season Grasses</b>		
Little bluestem	SCSC	G
Prairie sandreed	CALO	F
Sand bluestem	ANHA	F
Sideoats grama	BOCU	F
<b>Legumes</b>		
Alfalfa	MESA	G
Purple prairieclover	DAPUP	F
Sainfoin	ONVI	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	2800
Pubescent wheatgrass	1600	2800
Western wheatgrass	1000	1900

**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:** MT0004

**Growth Curve Name:** Alfalfa 2 Cuttings Dry

**Growth Curve Description:** Drylad, 2 Cuttings For Hay Then Graze Aftermath

<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	35	30	15	5	5	0	0	0

**Growth Curve Number:** MT0002

**Growth Curve Name:** Cool Season Grass Dryland

**Growth Curve Description:** Dryland 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	40	10	0	5	0	0	0

**Growth Curve Number:** MT0003

**Growth Curve Name:** Warm Season Grass Dryland

**Growth Curve Description:** Dryland 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	30	40	20	0	0	0	0

**Soil Limitations**

The primary limitation for these soils is their shallow to moderate depth to sand and gravel or bedrock and resulting low available water capacity which limits species selection and production potential. On steeper slopes water erosion is a potential problem during establishment, when renovating stands, and in thin established stands. Livestock trail erosion is a potential problem on established stands. Also, wind erosion is a potential problem during stand establishment on moderately coarse textured soils.

### **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.

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**

G053AY120MT

##### **FSG Narrative**

Droughty Loam soils have higher available water capacity and greater production potential.

G053AY300MT

Sands have coarser surface textures.

#### **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 Montana and North Dakota counties in MLRA 53A
- Montana and North Dakota 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

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

**Original Author:** Tim Nordquist

**Original Date:** 9/30/200

**Approval by:** Loretta J. Metz (MT) and Jeff Printz (ND)

**Approval Date:** March 2005