

FORAGE SUITABILITY GROUP

SANDY, DRY, 10-14" ppt/ >90 Freeze Free Days

FSG No.: G052XG026MT

Major Land Resource Area: 052X -Brown Glaciated Plain

Physiographic Features

MLRA 52 is characterized by gentle to rolling glaciated plains, with steep slopes bordering the larger rivers. Elevation ranges from 1900 to 4600 feet, with an increase from east to west. The Milk River has extensive flood plains, but other streams usually have narrow, discontinuous flood plains.

Sandy, Dry FSGs occur on the shoulder and back slopes of hills and till plains.

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1900	4600
Slope (percent):	0	15
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Low	

Climatic Features

MLRA 52 lies in a semi-arid, temperate climate. Annual precipitation ranges from 10 to 14 inches, with most rainfall occurring in spring to early summer. Summer thunderstorms are common and can bring added precipitation. Precipitation in the winter falls as snow.

Average annual snowfall ranges from 4.5" at Chester to 49.7" at Fort Benton. Snow cover depths greater than 1 inch range from 1 day at Port of Morgan to 68 days at Simpson.

Average July temperatures are about 68 degrees F., and average January temperatures are about 17 degrees F. Recorded temperature extremes in the MLRA during the years 1971 to 2000 are a low of -52 at Chester, and a high of 109 at Malta 35 SE.

Irrigation occurs out of the Milk River, but most of the area depends on precipitation for water. Precipitation is the main limiting factor in production for this area, with extreme temperatures being the second most limiting factor. MLRA 52 lies in USDA Plant Hardiness Zones 3a and 3b. Growth of native cool season plants begins in early April and continues to about the first of July depending on the year. Native warm season plants begin growth about mid-May and continue to mid-August. Adapted introduced grass and legume species can expand on native vegetation growing season windows to some degree. Some "green up" of cool season plants may occur in September and October of most years when moisture is present.

Detailed information, which describes the physiography, groundwater, soils drainage and climate is available by referring to

the local USDA-NRCS County Soil Survey. Site specific climatic data within MLRA 52 can be found at the following web site; <http://www.wrcc.sage.dri.edu/> OR <http://www.wcc.nrcs.usda.gov/cgibin/state.pl?state=mt>.

More than 50 climate stations are located within this MLRA. With such wide variations in climate information, the user should access the station closest to the site being evaluated.

Freeze-free period (28 deg)(days): (9 years in 10 at least)	90	120
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)		
Last Frost in Spring (32 deg): (1 year in 10 later than)		
First Frost in Fall (32 deg): (1 year in 10 earlier than)		
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)		
Length of Growing Season (32 deg)(days): (9 years in 10 at least)	75	101
Growing Degree Days (40 deg):		
Growing Degree Days (50 deg):		
Annual Minimum Temperature:	-36	-31
Mean annual precipitation (inches):	10	14

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												
Precip. More Than												
Monthly Average:	0.41	0.28	0.56	0.92	2.11	2.29	1.61	1.31	1.17	0.63	0.46	0.40
Temp. Min.												
Temp. Max.												
Temp. Avg.	17.1	23.5	33.4	44.6	54.4	62.4	67.8	67.1	56.3	45.3	29.8	20.2

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
MT0770	Big Sandy, MT	1971	2000
MT3113	Fort Benton, MT	1971	2000
MT8021	Sun River 4 S, MT	1971	2000
MT1974	Conrad, MT	1971	2000
MT1692	Chester, MT	1971	2000
MT7620	Simpson 6 NW, MT	1971	2000
MT3929	Harlem 4 W, MT	1971	2000
MT5340	Malta 35 S, MT	1971	2000
MT6672	Port of Morgan, MT	1976	2000
MT1722	Chinook, MT	1971	2000

Soil Interpretations

This FSG contains deep to very deep, somewhat excessively drained to excessively drained soils formed in eolian material or deposits or alluvium from sandstone. Electrical conductivity is <4 mmhos/cm, sodium absorption ratio is <13, and calcium carbonate equivalent is <15 percent.

Drainage Class:	Somewhat excessively drained	To	Excessively drained
Permeability Class: (0 - 40 inches)	Moderately rapid	To	Rapid
Frost Action Class:	Low	To	

	<u>Minimum</u>	<u>Maximum</u>
Depth:	60	72
Surface Fragments >3" (% Cover):		
Organic Matter (percent): (surface layer)	2.0	4.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	0	4
Sodium Absorption Ratio: (0 - 12 inches)	0	13
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	5.5	8.5
Available Water Capacity (inches): (0 - 60 inches)	3	6
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	15

Adapted Species List

The following forage species have been separated by common grouping methods which relate to principle growth period or taxonomic differences. Within these categories a further subdivision has been provided denoting whether the plant is native (N) or introduced (I) and recommended for dryland or irrigated conditions. Since some forages can be valuable when grown under dryland conditions but provide enhanced yield or additional cuttings when irrigated they may appear under both categories. Some species are more or less exclusive to only one management system and are represented as such.

<u>Cool Season Grasses</u>	<u>Scientific Symbol</u>	<u>Dryland</u>	<u>Irrigated</u>
Big bluegrass (N)	POSE	YES	YES
Canada wildrye (N) 1/	ELCA4	NO	YES
Creeping meadow foxtail (I)	ALAR	NO	YES
Hybrid wheatgrass (I) 1/	ELHO3	YES	NO
Indian ricegrass (N)	ACHY	YES	NO
Intermediate wheatgrass (I)	THIN6	NO	YES
Orchardgrass (I)	DAGL	NO	YES
Pubescent wheatgrass (I)	THIN6	NO	YES
Slender wheatgrass (N)	ELTR7	YES	YES
Thickspike wheatgrass (N)	ELLAL	YES	YES

Western wheatgrass (N)	PASM	YES	YES
<u>Warm Season Grasses</u>			
	<u>Scientific Symbol</u>	<u>Dryland</u>	<u>Irrigated</u>
Little bluestem (N)	SCSC	YES	NO
Prairie sandreed (N)	CALO	YES	NO
Sand bluestem (N)	ANHA	YES	NO
Sideoats grama (N)	BOCU	YES	NO
<u>Legumes</u>			
	<u>Scientific Symbol</u>	<u>Dryland</u>	<u>Irrigated</u>
Alfalfa (I)	MESA	YES	YES
Birdsfoot trefoil (I)	LOCO6	NO	YES
Sainfoin (I)	ONVI	YES	NO
Small burnet (I)	SAMI3	NO	YES
<u>Other Perennial Forbs</u>			
	<u>Scientific Symbol</u>	<u>Dryland</u>	<u>Irrigated</u>
Lewis flax (N)*	LILE3	YES	NO
Maximillian sunflower (N)*	HEMA2	YES	NO
Purple/white prairieclover (N)*	DAPU5	YES	NO
<u>Annual Species</u>			
	<u>Scientific Symbol</u>	<u>Dryland</u>	<u>Irrigated</u>
Field peas	PISAA2	YES	NO
Hay/feed barley	HORDE	YES	YES
Hay/feed oats	AVENA	YES	YES
Lentils	LENS	YES	NO
Peas/small grains	LATHY	YES	YES
Rye, wheat, spelt, triticale	TRITI	YES	YES

Adaptation of forages to this Forage Suitability Group (FSG) covers a relatively wide range of potentials from highly adapted to moderately well adapted. Since various cultivars within a specie can be more or less productive on a particular site within this FSG the species in general will be listed if it will thrive on one or more of these sites. It is up to the FSG (user) to determine the appropriate scope of adaptation the listed species (or their cultivars) have which will lead to their successful establishment and acceptable yields.

*These species only recommended for components of native mixtures.

1/ Recommended for upper end of 10-14" precipitation zone

Production Estimates

The following data represents "best available estimates" from many sources on representative species adapted to this FSG. In time and as documented data acquisition allows, specific plot, field trial or field clipping information will be incorporated into this document.

All pasture production estimates are determined as initial stocking rates and developed by multiplying a predicted forage yield times an expected harvest efficiency of 30%, then dividing that value by 1 animal unit month's "consumption" (915 lbs air dry).

Production estimates represent total annual production.

Forage Crop	<u>Dryland</u>		<u>Irrigated</u>	
	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
	(lbs/ac/yr)	(lbs/ac/yr)	(lbs/ac/yr)	(lbs/ac/yr)
Alfalfa	1900	2500	2400	3900
Alfalfa/ cool season grass mix	1900	2500	2400	3900
Introduced cool season grasses	1400	2000	1700	2400
Native cool season grasses	780	1800		
Warm season grasses	900	1200		

Pasture	<u>Dryland</u>		<u>Irrigated</u>	
	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
	(AUMs/ac)	(AUMs/ac)	(AUMs/ac)	(AUMs/ac)
Alfalfa	0.6	0.8	0.8	1.3
Alfalfa/ cool season grass mix	0.6	0.8	0.8	1.3
Introduced cool season grasses	0.5	0.7	0.6	0.8
Native cool season grasses	0.2	0.6		
Warm season grasses	0.3	0.4		

1 AUM = 915 lbs air-dry

Forage Growth Curves

Growth Curve Number: MT52XG02
Growth Curve Name: 10-14" dryland alfalfa, 1 cutting
Growth Curve Description:

Percent Production by Month

<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	10	25	20	20	10	15	0	0	0

Growth Curve Number: MT52XY03
Growth Curve Name: 10-19" dryland legumes, 1 cutting
Growth Curve Description: (trefoil, sainfoin, clover)

Percent Production by Month

<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	20	30	20	10	20	0	0	0

Growth Curve Number: MT52XY04
Growth Curve Name: 10-19" dryland alfalfa (0-25) with cool season grass (>75%)
Growth Curve Description:

Percent Production by Month

<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	25	15	5	15	0	0	0

Growth Curve Number: MT52XG05
Growth Curve Name: 10-14"dryland legume, 1 cutting with cool season grass
Growth Curve Description: (trefoil, sainfoin, clover + cool season grasses)

Percent Production by Month

<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	10	30	20	20	5	15	0	0	0

Growth Curve Number: MT52XG08
Growth Curve Name: 10-14" dryland intermediate/ pubescent wheatgrass/Altai wildrye
Growth Curve Description:

Percent Production by Month

<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	45	10	5	10	0	0	0

Soil Limitations

The Sandy, Dry FSG has several limiting factors. The soil texture makes it susceptible to wind erosion. Somewhat excessive to excessive drainage, as well as low to moderate available water holding capacity will limit species selection and potential production. Stand establishment and future management will need to take into account the erosive nature of the soils in this FSG. Some soils within this FSG have a lower AWC (3-6"), which may decrease production of deep-rooted perennials by approximately 25%. Also, low natural fertility is another limitation.

Management Interpretations

The impact on yields can be reduced by selecting species adapted to the droughty conditions and coarse textures inherent to these soils. To reduce the potential for sheet and rill erosion, especially on steeper slopes, include sod forming grass species in stands. Integrate both wind and water erosion control practices during the establishment period. Facilitating practices such as salting, water developments, fencing, trails, and herding can often be used effectively to change livestock behavior and use patterns.

Management can include considerations for wildlife. Timing of haying and livestock grazing can avoid peak nesting and fawning periods. Consider planting species with later maturity to allow nests to fledge before harvesting. Avoid mowing around the field; mow back and forth or from the inside to the outside of the field.

For detailed descriptions of management guidelines, refer to the NRCS Prescribed Grazing (528), and Pasture and Hay Planting (512) specifications.

Site Documentation

Similar Sites:

Similar FSG's:

FSG ID

G052XG019MT

FSG Narrative

Loamy, dry soils have a finer soil texture.

Inventory Data References:

Inventory Data References:

- Agriculture Handbook 296 - Land Resource Regions and Major Land Resource Areas
- Natural Resources Conservation Service (NRCS) National Water and Climate Center
- National Soil Survey Information System (NASIS) for soil surveys in Montana
- NRCS National Range and Pasture Handbook
- NRCS Field Office Technical Guides
- Various Agricultural Research Service, Cooperative Extension Service, and NRCS research trials for plant adaptation and production
- "Dryland Pastures in Montana and Wyoming" Species and Cultivars, Seeding Techniques and Grazing Management, Montana State University, EB19
- "Salinity and Sodicity and North Dakota Soils", North Dakota State University, EB57
- USDA Plant Hardiness Zone Maps

State Correlation:

This site has been correlated with the following states:

Forage Suitability Group Approval:

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Original Date: 1/30/2006

Approval by: Loretta J. Metz

Approval Date: 8/16/2006