

FORAGE SUITABILITY GROUP

Loam

FSG No.: G053CY100SD

Major Land Resource Area: 53C - Southern Dark Brown Glaciated Plains

Physiographic Features

Soils in this group typically occur on upland positions such as backslopes, footslopes, and toeslopes of glacial till plains. Some occur on high flood plains and terraces along streams that flow through the glacial plains.

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1300	2300
Slope (percent):	0	15
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Low	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 53C. Average annual precipitation for all climate stations listed below is about 20 inches. About 75 percent of that occurs during the months of April through September. On average, there are about 28 days with greater than .1 inches of precipitation during the same time frame. Annual precipitation and temperature increase from the north to the south in the MLRA. 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 23 inches at Pickstown to 46 inches at Harrold. Snow cover at depths greater than 1 inch range from 38 days at Gettysburg to 65 days at Harrold.

Average July temperatures are about 75⁰F and average January temperatures are about 16⁰F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -40 and a high of 113 both recorded at Harrold. The MLRA lies mostly in USDA Plant Hardiness Zones 4a and 4b, with a small area of warmer 5a along the Missouri River.

At Huron, the closest station with records, the average annual wind speeds are about 11.5 mph. The highest wind speeds occur during March through May. It is cloudy about 154 days a year. Average morning relative humidity in June is about 86 percent and average afternoon humidity is 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>.

Loam

Pastureland and Hayland Interpretations

	From	To
Freeze-free period (28 deg)(days): (9 years in 10 at least)	122	156
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)	May 24	May 07
Last Frost in Spring (32 deg): (1 year in 10 later than)	Jun 14	May 17
First Frost in Fall (32 deg): (1 year in 10 earlier than)	Aug 27	Sep 23
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	Sep 16	Oct 04
Length of Growing Season (32 deg)(days): (9 years in 10 at least)	85	136
Growing Degree Days (40 deg):	4388	5543
Growing Degree Days (50 deg):	2532	3338
Annual Minimum Temperature:	-30	-15
Mean annual precipitation (inches):	17	25

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	0.10	0.13	0.55	1.00	1.21	1.40	1.26	1.02	0.46	0.47	0.15	0.19
Precip. More Than	0.62	0.83	2.36	3.48	4.20	5.55	3.95	3.29	3.60	2.43	1.49	0.94
Monthly Average:	0.40	0.55	1.38	2.23	2.88	3.25	2.74	2.21	1.78	1.37	0.70	0.55
Temp. Min.	1.3	7.5	18.2	31.1	42.2	52.3	58.2	55.5	44.9	32.8	18.9	6.1
Temp. Max.	30.1	35.8	47.6	63.8	75.1	85.3	91.1	88.7	78.0	65.5	47.0	32.9
Temp. Avg.	15.7	21.9	32.8	47.3	58.6	68.5	75.1	72.9	62.2	49.8	33.5	19.6

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
SD6574	Pickstown, SD	1961	1990
SD8767	Wagner, SD	1961	1990
SD3294	Gettysburg, SD	1961	1990
SD3608	Harrold, SD	1963	1990
SD0043	Academy, SD	1961	1990
SD6292	Onida, SD	1961	1990
SD3832	Highmore, SD	1961	1990
SD7992	Stephan, SD	1961	1990

Soil Interpretations

This group consists of very deep, mostly well drained, medium to moderately fine textured soils formed mostly from, glacial till and from wind and water deposited materials. Available water capacity is high and permeability is slow to moderate.

Drainage Class:	Moderately well drained	To	Well drained
Permeability Class: (0 - 40 inches)	Slow	To	Moderate
Frost Action Class:	Low	To	Moderate

	<u>Minimum</u>	<u>Maximum</u>
Depth:	72	
Surface Fragments >3" (% Cover):	0	3
Organic Matter (percent): (surface layer)	2.0	6.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	0	4
Sodium Absorption Ratio: (0 - 12 inches)	0	1
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	6.1	7.8
Available Water Capacity (inches): (0 - 60 inches)	9	

	<u>Minimum</u>	<u>Maximum</u>
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	8

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/>

Cool Season Grasses

Altai wildrye	F
Canada wildrye	F
Crested wheatgrass	G
Green needlegrass	G
Intermediate wheatgrass	G
Meadow bromegrass	G
Newhy hybrid wheatgrass	G
Pubescent wheatgrass	G
Russian wildrye	G
Slender wheatgrass	G
Smooth bromegrass	G
Tall wheatgrass	G
Western wheatgrass	G

Legumes

Alfalfa	G
Birdsfoot trefoil	F
Canada milkvetch	G
Cicer milkvetch	G
Purple prairieclover	G
Sainfoin	F
Sweetclover	G
White prairieclover	G

Warm Season Grasses

Big bluestem	G
Indiangrass	G
Little bluestem	G
Prairie sandreed	F
Sand bluestem	F
Sideoats grama	G
Switchgrass	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	Management Intensity	
	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)
Alfalfa	8600	3700
Alfalfa/Intermediate wheatgrass	7100	3100
Alfalfa/smooth bromegrass	7100	3100
Big bluestem	6300	2700
Crested wheatgrass	5500	2300
Green needlegrass	4300	1900

Forage Crop	Management Intensity	
	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)
Intermediate wheatgrass	5900	2500
Smooth brome grass	5900	2500
Switchgrass	7000	2900
Western wheatgrass	4300	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: SD0001
Growth Curve Name: Alfalfa
Growth Curve Description: Alfalfa, MLRAs 107, 102B, 63B, 66, 65

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	30	25	20	15	5	0	0	0

Growth Curve Number: SD0004
Growth Curve Name: Cool season grass
Growth Curve Description: Cool season grass, statewide

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	40	30	10	5	5	0	0	0

Growth Curve Number: SD0005
Growth Curve Name: Warm season grass
Growth Curve Description: Warm season grass, statewide

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	10	40	35	15	0	0	0	0

Soil Limitations

These soils have few limitations to the production of climatically adapted forage crops. 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 in established stands.

Management Interpretations

Including sod forming grass species in stands, especially on steeper slopes, will reduce the potential for sheet and rill erosion. Incorporate 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.

FSG Documentation

Similar FSG's:

<u>FSG ID</u>	<u>FSG Narrative</u>
G053CY120S	Droughty Loam soils are shallower or coarser textured resulting in lower available water capacity and lower production potential.
G053CY500S	Overflow soils receive additional moisture due to a favorable landscape position resulting in a higher 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
National Soil Survey Information System (NASIS) for soil surveys in South Dakota counties in MLRA 53C
NRCS South Dakota 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: South Dakota

Forage Suitability Group Approval

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Original Date:

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