

FORAGE SUITABILITY GROUP (FSG) Droughty Loam

FSG No.: G064XY120NE

Major Land Resource Area (MLRA): 64 - Mixed Sandy and Silty Tableland



Physiographic Features

The soils in this group are found on upland slopes, plains, fans and fan remnants, terraces, and non-flooded floodplains.

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	2950	3940
Slope (percent):	0	15
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	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 64. Average annual precipitation for all climate stations listed below is about 16 inches. About 79 percent of the annual precipitation occurs during the months of April through September. On average, there are about 26 days with greater than .1 inches of precipitation during that same time period. Precipitation in this MLRA 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 20 inches at Interior, South Dakota (SD), to 60 inches at Harrison, Nebraska (NE). Snow cover at depths greater than 1 inch range from 28 days at Interior, SD, to 60 days at Long Valley, SD.

Average July temperatures across the MLRA are about 74°F and average January temperatures are about 22°F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -45°F and a high of 114 both recorded at Porcupine, SD. The MLRA lies mostly in USDA Plant Hardiness Zones 4a and 4b, with a small area of warmer 5a around Alliance, NE.

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)	111	158
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)	Jun 01	May 05
Last Frost in Spring (32 deg): (1 year in 10 later than)	Jun 12	May 14
First Frost in Fall (32 deg): (1 year in 10 earlier than)	Sep 06	Sep 19

	From	To
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	Sep 11	Sep 28
Length of Growing Season (32 deg)(days): (9 years in 10 at least)	94	135
Growing Degree Days (40 deg):	3867	4974
Growing Degree Days (50 deg):	2128	2913
Annual Minimum Temperature:	-30	-15
Mean annual precipitation (inches):	15	18

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	0.07	0.10	0.32	0.71	1.22	1.19	1.43	0.66	0.34	0.47	0.12	0.15
Precip. More Than	0.37	0.61	1.87	3.10	4.14	5.14	3.84	2.61	2.02	1.57	0.81	0.50
Monthly Average:	0.33	0.38	0.97	1.88	2.89	2.90	2.32	1.50	1.33	0.97	0.47	0.38
Temp. Min.	8.5	13.4	19.6	28.9	38.8	48.6	55.1	52.7	42.0	31.1	19.8	11.0
Temp. Max.	35.1	40.2	49.7	63.0	73.1	83.6	92.0	91.0	79.9	67.9	48.9	37.1
Temp. Avg.	22.4	27.4	35.2	46.2	56.8	66.7	74.2	72.2	61.3	49.4	35.1	24.5

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
SD4184	Interior, SD	1961	1990
SD4983	Long Valley, SD	1961	1990
SD6736	Porcupine, SD	1963	1990
NE1575	Chadron, NE	1961	1990
NE0130	Alliance, NE	1961	1990
NE3615	Harrison, NE	1961	1990

Soil Interpretations

This group consists of deep and very deep, well drained, medium to moderately coarse textured soils. Available water capacity is moderate due to the moderately coarse surface textures or moderate depths to sand and gravel.

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

	<u>Minimum</u>	<u>Maximum</u>
Depth:	40	
Surface Fragments >3" (% Cover):	0	3
Organic Matter (percent): (surface layer)	0.5	4.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	0	2
Sodium Absorption Ratio: (0 - 12 inches)	0	0
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	6.1	8.4
Available Water Capacity (inches): (0 - 60 inches)	6	9
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	6

Soil Component List (Some phases of these soils may also occur in other FSG's)

Alice	Glenberg	Manter	Satanta
Anselmo	Jayem	Moskee	Tuthill
Busher	Julesburg	Sarben	

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://www.plants.usda.gov>.

<u>Cool Season Grasses</u>	<u>Symbol</u>	<u>Dry</u>	<u>Irrig</u>	<u>Warm Season Grasses</u>	<u>Symbol</u>	<u>Dry</u>	<u>Irrig</u>
Altai wildrye	LEAN3	G	NS	Big bluestem	ANGE	NS	G
Basin wildrye	LECI4	G	NS	Little bluestem	SCSC	G	NS
Crested wheatgrass	AGCR	G	NS	Prairie sandreed	CALO	F	NS
Green needlegrass	NAVI4	G	NS	Sand bluestem	ANHA	F	NS
Intermediate wheatgrass	THIN6	F	G	Sand lovegrass	ERTR3	F	NS
Meadow brome	BRBI2	NS	G	Sideoats grama	BOCU	G	NS
Newhy hybrid wheatgrass		F	NS	Switchgrass	PAVIV	NS	G
Orchardgrass	DAGL	NS	G	<u>Legumes</u>	<u>Symbol</u>	<u>Dry</u>	<u>Irrig</u>
Pubescent wheatgrass	THIN6	G	G	Alfalfa	MESA	G	G
Russian wildrye	PSJU3	G	NS	Birdsfoot trefoil	LOCO6	NS	G
Smooth brome	BRINI2	F	G	Cicer milkvetch	ASCI4	G	F
Streambank wheatgrass	ELLAL	G	NS	Purple prairieclover	DAPUP	G	NS
Tall wheatgrass	THPO7	F	NS	Red clover	TRPR2	NS	G
Thickspike wheatgrass	ELMA7	G	NS	Sainfoin	ONVI	F	NS
Western wheatgrass	PASM	G	NS	White prairieclover	DACAC	G	NS

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
 NS - Species is not adapted to the site and should not be planted

Production Estimates

Production estimates listed here should only be used for making general management recommendations. Onsite 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>		<u>Irrigated</u>	
	Management Intensity		Management Intensity	
	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)
Alfalfa	2900	1700		
Alfalfa/Crested wheatgrass	2300	1400		
Alfalfa/Intermediate wheatgrass	2300	1400	11400	6900
Alfalfa/Pubescent wheatgrass	2300	1400	11400	6900
Alfalfa/Smooth brome			11400	6900
Crested wheatgrass	2000	1100		
Intermediate wheatgrass	2000	1100	11400	6900
Pubescent wheatgrass	3700	1100	11400	6900
Smooth brome			11400	6900

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: SD0002
Growth Curve Name: Alfalfa
Growth Curve Description: Alfalfa, MLRA's 65, 64, 60A
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	35	15	5	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

Growth Curve Number: SD0003
Growth Curve Name: Irrigated Alfalfa
Growth Curve Description: Irrigated Alfalfa, 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	5	25	25	20	15	10	0	0	0

Soil Limitations

The primary limitation for these soils is their moderate available water capacity which limits plant growth during periods of moisture deficit. On steeper slopes water erosion is a potential problem during stand establishment, and 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

Selecting forage species that are tolerant to periods of drought and inadequate soil moisture can reduce the impact on yields of the moderate available water capacity of these soils. 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.

FSG Documentation

Similar FSG's:

FSG ID

G064XY100N

FSG Narrative

Loamy soils have greater available water capacity and greater production potential.

G064XY130N

Very Droughty Loams have lower available water capacity and lower 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 for soil surveys in South Dakota, Nebraska, and Wyoming counties in MLRA 64
NRCS Nebraska and Wyoming Field Office Technical Guide and South Dakota Technical Guide
NRCS National Range and Pasture Handbook
Various South Dakota and Nebraska 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: Nebraska, South Dakota, and Wyoming

Forage Suitability Group Approval:

Original Author: Tim Nordquist
Original Date: 4/15/02
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Approval Date: 9/17/2004