

FORAGE SUITABILITY GROUP Sand

FSG No.: G064XY300NE

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

Physiographic Features

Soils in the Sand group are found on upland slopes, sand hills dune and level topography, interdune areas, terraces, and flood plains.



	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	2950	3940
Slope (percent):	0	15
Flooding:		
Frequency:	None	Frequent
Duration:	None	Brief
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.

Average annual snowfall ranges from 20 inches at Interior, SD to 60 inches at Harrison, 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 degrees F., and average January temperatures are about 22 degrees F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -45 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

First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	From Sep 11	To 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:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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 very deep, well to excessively drained, coarse textured soils formed from sandy alluvial and eolian materials. Available water capacity is low to moderate and permeability is moderate to rapid.

Drainage Class:	Well drained	To	Excessively drained
Permeability Class: (0 - 40 inches)	Moderate	To	Rapid
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)	0.5	3.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	0	4
Sodium Absorption Ratio: (0 - 12 inches)	0	6
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	5.6	8.4
Available Water Capacity (inches): (0 - 60 inches)	3	9
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	6

Soil Component List (Some phases of these soils may also occur in other FSGs)

Bankard	Dunday	Jayem	Valent
Bankard variant	Dwyer	Orpha	Valentine
Dailey	Ipage	Tuthill	

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	F	NS	Big bluestem	ANGE	F	G
Crested wheatgrass	AGCR	G	NS	Little bluestem	SCSC	G	NS
Intermediate wheatgrass	THIN6	NS	G	Prairie sandreed	CALO	G	NS
Meadow brome	BRBI2	NS	G	Sand bluestem	ANHA	G	NS
Newhy hybrid wheatgrass		F	NS	Sand lovegrass	ERTR3	F	NS
Orchardgrass	DAGL	NS	G	Sideoats grama	BOCU	F	NS
Pubescent wheatgrass	THIN6	F	G	Switchgrass	PAVIV	F	G
Smooth brome	BRINI2	NS	G	<u>Legumes</u>	<u>Symbol</u>	<u>Dry</u>	<u>Irrig</u>
Streambank wheatgrass	ELLAL	G	NS	Alfalfa	MESA	G	G
Thickspike wheatgrass	ELMA7	F	NS	Birdsfoot trefoil	LOCO6	NS	G
Western wheatgrass	PASM	F	NS	Cicer milkvetch	ASCI4	G	F
				Purple prairieclover	DAPUP	F	NS
				Red clover	TRPR2	NS	G
				White prairieclover	DACAC	F	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. 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>		<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	3100	2000		
Alfalfa/Crested wheatgrass	2600	1700		
Alfalfa/Intermediate wheatgrass			11400	8600
Alfalfa/Pubescent wheatgrass	2600	1700	11400	8600
Alfalfa/Smooth brome grass			14300	8600
Crested wheatgrass	2000	1400		
Intermediate wheatgrass			9100	6900
Pubescent wheatgrass	2000	1400	9100	6900
Sand bluestem	3100	1700		
Smooth brome grass			9100	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, MLRAs 65, 64, 60A

<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	35	15	5	5	0	0	0

Growth Curve Number: SD0004

Growth Curve Name: Cool season grass

Growth Curve Description: Cool season grass, state wide

<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	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, state wide

<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

Growth Curve Number: SD0003

Growth Curve Name: Irrigated Alfalfa

Growth Curve Description: Irrigated Alfalfa, state wide

<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	25	20	15	10	0	0	0

Soil Limitations

Soil blowing is a severe hazard during stand establishment or renovation of forage stands on the soils of this group. Bare areas where livestock concentrate are also susceptible. Production potential is low to moderate due to the low available water capacity and droughtiness of these soils. Also, these soils are typically low in native fertility and have reduced capacity to supply plant nutrients. Species choices are somewhat limited for pasture and hayland for these same reasons.

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 and can grow on coarse soils. Incorporate wind erosion control practices during stand establishment. Properly locating facilitating practices such as fences, lanes, and water developments can help control livestock movement, reduce trailing perpendicular to steeper slopes, evenly distribute grazing pressure, and reduce bare areas.

FSG Documentation

Similar FSGs:

FSG ID

G064XY130N

FSG Narrative

Very Droughty Loam soils have finer textures than sands.

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 South Dakota, Nebraska, and Wyoming counties in MLRA 64
South Dakota and Nebraska and Wyoming NRCS Field Office Technical Guides
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:

NE

SD

WY

Forage Suitability Group Approval:

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Original Date: 4/15/02

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Approval Date: