

FORAGE SUITABILITY GROUP SAND

FSG No.: G063BY300SD

Major Land Resource Area: 63B - Southern Rolling Pierre Shale Plains

Physiographic Features

Soils in the Sand group are found on upland slopes, terraces, and flood plains.

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1300	2000
Slope (percent):	0	11
Flooding:		
Frequency:	None	Frequent
Duration:	None	Very Brief
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Negligible	Very low

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 63B. Average annual precipitation for all climate stations listed below is about 22 inches. About 76 percent of the annual precipitation occurs during the months of April through September. On average, there are about 29 days with greater than .1 inches of precipitation during that same timeframe.

Average annual snowfall ranges from 19 inches at Creighton, Nebraska (NE,) to 44 inches at Winner, South Dakota (SD). Snow cover at depths greater than 1 inch range from 4 days at Stephan, SD, to 57 days at Winner.

Average July temperatures across the MLRA are about 76⁰F and average January temperatures are about 17⁰F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -37 and a high of 114 both recorded at Kennebec, SD. The MLRA lies in USDA Plant Hardiness Zones 4b and 5a.

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)	128	152
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)	May 20	May 08
Last Frost in Spring (32 deg): (1 year in 10 later than)	Jun 09	May 17
First Frost in Fall (32 deg): (1 year in 10 earlier than)	Sep 01	Sep 21
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	Sep 19	Sep 30
Length of Growing Season (32 deg) (days): (9 years in 10 at least)	92	131
Growing Degree Days (40 deg):	4526	5505
Growing Degree Days (50 deg):	2652	3257
Annual Minimum Temperature:	-25	-15
Mean annual precipitation (inches):	18	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	0.06	0.09	0.27	0.66	1.18	1.80	1.24	0.73	0.65	0.55	0.12	0.13
Precip. More Than	0.54	1.24	2.70	3.97	5.70	5.65	4.96	3.94	4.34	2.64	1.49	0.85
Monthly Average:	0.41	0.55	1.56	2.36	3.34	3.54	3.08	2.45	2.13	1.45	0.77	0.56
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.	32.4	38.6	48.5	62.8	74.0	84.0	91.1	88.9	78.7	66.0	47.7	35.2
Temp. Avg.	18.7	24.4	34.9	48.5	59.6	69.5	75.7	73.5	63.2	51.1	35.2	22.4

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
NE1990	Creighton, NE	1961	1990
NE1365	Butte, NE	1961	1990
SD9367	Winner, SD	1961	1990
SD0778	Bonesteel, SD	1961	1990
SD3452	Gregory, SD	1961	1990
SD7992	Stephan, SD	1961	1990
SD4516	Kennebec, SD	1961	1990

Soil Interpretations

This group consists mostly of very deep, somewhat excessively and excessively drained, coarse textured soils formed from alluvial and eolian sandy materials. Available water capacity is low and permeability is rapid.

Drainage Class:	Well drained	To	Excessively drained
Permeability Class: (0 - 40 inches)	Rapid	To	Rapid
Frost Action Class:	Low	To	Low

	<u>Minimum</u>	<u>Maximum</u>
Depth:	20	
Surface Fragments >3" (% Cover):	0	3
Organic Matter (percent): (surface layer)	0.0	3.0
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)	5.6	7.8
Available Water Capacity (inches): (0 - 60 inches)	3	6
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	5

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>Cool Season Grasses</u>	<u>Dryland</u>	<u>Irrigated</u>
Crested wheatgrass	F	NS
Intermediate wheatgrass	F	G
Meadow brome grass	NS	G
Orchardgrass	NS	G
Pubescent wheatgrass	F	G
Smooth brome grass	F	G
Western wheatgrass	F	NS

<u>Warm Season Grasses</u>	<u>Dryland</u>	<u>Irrigated</u>
Big bluestem	G	G
Indiangrass	G	G
Little bluestem	G	NS
Prairie sandreed	G	NS
Sand bluestem	G	NS
Sand lovegrass	F	NS
Sideoats grama	F	NS
Switchgrass	G	G

<u>Legumes</u>	<u>Dryland</u>	<u>Irrigated</u>
Alfalfa	G	G
Birdsfoot trefoil	NS	G
Cicer milkvetch	F	F
Illinois bundleflower	F	NS
Purple prairieclover	F	NS
Red clover	NS	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

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

	Management Intensity		Management Intensity	
	High (lbs/ac)	Low (lbs/ac)	High (lbs/ac)	Low (lbs/ac)
Alfalfa	5100	3100		
Alfalfa/Intermediate wheatgrass	4000	2600	14300	8600
Alfalfa/Smooth brome grass	4000	2600	14300	8600
Indiangrass	4000	2300		
Intermediate wheatgrass	2900	2000	11400	6900
Sand bluestem	5100	2900		
Smooth brome grass	3400	2000	11400	6900
Switchgrass	5100	2900		

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, MLRA's 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

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

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 FSG's:

<u>FSG ID</u>	<u>FSG Narrative</u>
G063BY130S	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 and Nebraska counties in MLRA 63B
South Dakota and Nebraska 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: Nebraska and South Dakota

Forage Suitability Group Approval

Original Author: Tim Nordquist
Original Date: 4/3/02
Approval by: Dave Schmidt
Approval Date: 8/22/03