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.

	Minimum	Maximum
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 time frame.

Average annual snowfall ranges from 19 inches at Creighton, NE to 44 inches at Winner, 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 76 degrees F., and average January temperatures are about 17 degrees F. 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

	From	To
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:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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

Climate Station	Location	From	To
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

	Minimum	Maximum
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

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

Bazile
Inavale
Inavale variant
Simeon
Thurman
Valentine
Wewela

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/

Cool Season Grasses	Symbol	Dry	Irrig
Crested wheatgrass	AGCR	F	NS
Intermediate wheatgrass	THIN6	F	G
Meadow bromegrass	BRBI2	NS	G
Orchardgrass	DAGL	NS	G
Pubescent wheatgrass	THIN6	F	G
Smooth bromegrass	BRINI2	F	G
Western wheatgrass	PASM	F	NS
Warm Season Grasses			
Big bluestem	ANGE	G	G
Indiangrass	SONU2	G	G
Little bluestem	SCSC	G	NS
Prairie sandreed	CALO	G	NS
Sand bluestem	ANHA	G	NS
Sand lovegrass	ERTR3	F	NS
Sideoats grama	BOCU	F	NS
Switchgrass	PAVIV	G	G

Legumes	Symbol	Dry	Irrig
Alfalfa	MESA	G	G
Birdsfoot trefoil	LOCO6	NS	G
Cicer milkvetch	ASCI4	F	F
Illinois bundleflower	DEIL	F	NS
Purple prairieclover	DAPUP	F	NS
Red clover	TRPR2	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. 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	Dryland Management Intensity High (lbs/ac)	Dryland Management Intensity Low (lbs/ac)	Irrigated Management Intensity High (lbs/ac)	Irrigated Management Intensity Low (lbs/ac)
Alfalfa	5100	3100		
Alfalfa/Intermediate wheatgrass	4000	2600	14300	8600
Alfalfa/Smooth bromegrass	4000	2600	14300	8600
Indiangrass	4000	2300		
Intermediate wheatgrass	2900	2000	11400	6900
Sand bluestem	5100	2900		
Smooth bromegrass	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, MLRAs 107, 102B, 63B, 66, 65

Percent Production by Month

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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, state wide

Percent Production by Month

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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

Percent Production by Month

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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

Percent Production by Month

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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	FSG Narrative
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:
NE
SD

Forage Suitability Group Approval:

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