FORAGE SUITABILITY GROUP
Loam

FSG No.: **G063BY100SD**
Major Land Resource Area: 63B - Southern Rolling Pierre Shale Plains

Physiographic Features
Soils in this group typically occur on upland positions such as backslopes, footslopes, and toeslopes. Some occur on high flood plains and terraces.

	Minimum	Maximum
Elevation (feet):	1300	2000
Slope (percent):	0	15
Flooding:		
Frequency:	None	Rare
Duration:	None	Very Brief
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Negligible	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 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. 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 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

	From	To
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:	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, well drained, medium to moderately fine textured soils formed mostly from wind and water deposited materials. Available water capacity is high and permeability is moderately slow to moderate.

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

	Minimum	Maximum
Depth:	40	0
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	10
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	5.6	8.4
Available Water Capacity (inches): (0 - 60 inches)	10	13
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	18

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

Agar	Grigston	Hord	Paka
Bigbend	Hall	Lowry	Ree
Coly	Haverson	Moody	Reliance
Crofton	Haynie	Nimbro	Uly
Eltree	Haynie variant	Nora	

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	G	NS
Green needlegrass	NAVI4	G	NS
Intermediate wheatgrass	THIN6	G	G
Meadow bromegrass	BRBI2	G	G
Orchardgrass	DAGL	G	G
Pubescent wheatgrass	THIN6	G	G
Russian wildrye	PSJU3	G	NS
Smooth bromegrass	BRINI2	G	G
Tall wheatgrass	THPO7	G	NS
Western wheatgrass	PASM	G	NS
Warm Season Grasses			
Big bluestem	ANGE	G	G
Indiangrass	SONU2	G	G
Little bluestem	SCSC	G	NS
Prairie sandreed	CALO	F	NS
Sand bluestem	ANHA	F	NS
Sideoats grama	BOCU	F	NS
Switchgrass	PAVIV	G	G

Legumes	Symbol	Dry	Irrig
Alfalfa	MESA	G	G
Birdsfoot trefoil	LOCO6	F	G
Canada milkvetch	ASCAC6	F	NS
Cicer milkvetch	ASCI4	G	F
Illinois bundleflower	DEIL	F	NS
Purple prairieclover	DAPUP	F	NS
Red clover	TRPR2	F	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	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	9100	3400		
Alfalfa/Intermediate wheatgrass	8600	3400	17100	10300
Alfalfa/Smooth bromegrass	8600	3400	17100	10300
Big bluestem	6900	3400		
Intermediate wheatgrass	5700	2900	14300	8600
Smooth bromegrass	5100	2900	14300	8600
Switchgrass	6900	3400		

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

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

Incorporating erosion control practices during the establishment period and including sod forming grass species in stands, especially on steeper slopes, will reduce the potential for sheet and rill erosion. 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 FSGs:

FSG ID	FSG Narrative
G063BY120S	Droughty Loam soils are shallower or coarser textured resulting in lower available water capacity and lower production potential.
G063BY500S	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
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:	