FORAGE SUITABILITY GROUP (FSG)
Loam

FSG No.: G064XY100NE
Major Land Resource Area (MLRA): 64 - Mixed Sandy and Silty Tableland

Physiographic Features

The soils in this group are found on upland slopes and swales, tablelands, fans and fan aprons, pediments, terraces, and non-flooded flood plains.

	Minimum	Maximum
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	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 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:	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

Climate Station	Location	From	To
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 moderately deep to very deep, mostly well drained, moderately coarse to moderately fine textured soils formed mostly from wind and water deposited materials or materials weathered from sedimentary rock. Available water capacity is moderate to high and permeability is slow to moderately rapid.

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

	Minimum	Maximum
Depth:	20	
Surface Fragments >3" (% Cover):	0	3
Organic Matter (percent): (surface layer)	0.5	4.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	0	4
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)	5	13
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	10

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

Albinas	Dawes	Mitchell	Satanta
Alice	Duroc	Mobridge	Skilak
Alliance	Haverson	Munjor	Thirtynine
Altvan	Hemingford	Noden	Tripp
Bayard	Johnstown	Oglala	Ulysses
Blackpipe	Kadoka	Ponderosa	Vetal
Bridget	Keith	Recluse	Woodly
Coaliams	Keya	Ree	
Craft	Kube	Richfield	
Creighton	Mccook	Rosebud	

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

Cool Season Grasses	Symbol	Dry	Irrig
Altai wildrye	LEAN3	G	NS
Basin wildrye	LECI4	G	NS
Crested wheatgrass	AGCR	G	NS
Green needlegrass	NAVI4	G	NS
Intermediate wheatgrass	THIN6	G	G
Meadow bromegrass	BRBI2	F	G
Orchardgrass	DAGL	NS	G
Pubescent wheatgrass	THIN6	G	G
Russian wildrye	PSJU3	G	NS
Smooth bromegrass	BRINI2	F	G
Streambank wheatgrass	ELLAL	G	NS
Tall wheatgrass	THPO7	F	NS
Thickspike wheatgrass	ELMA7	G	NS
Western wheatgrass	PASM	G	NS

Warm Season Grasses	Symbol	Dry	Irrig
Big bluestem	ANGE	F	G
Little bluestem	SCSC	G	NS
Prairie sandreed	CALO	F	NS
Sand bluestem	ANHA	F	NS
Sideoats grama	BOCU	G	NS
Switchgrass	PAVIV	F	G
Legumes	**Symbol**	**Dry**	**Irrig**
Alfalfa	MESA	G	G
Birdsfoot trefoil	LOCO6	NS	G
Canada milkvetch	ASCAC6	F	NS
Cicer milkvetch	ASCI4	G	F
Purple prairieclover	DAPUP	F	NS
Red clover	TRPR2	NS	G
Sainfoin	ONVI	F	NS
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. 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	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	6000	2300		
Alfalfa/Crested wheatgrass	4900	2000		
Alfalfa/Intermediate wheatgrass	5400	2300	14300	8600
Alfalfa/Pubescent wheatgrass	5400	2300	14300	8600
Alfalfa/Smooth bromegrass			14300	8600
Crested wheatgrass	3100	1700		
Intermediate wheatgrass	3700	1700	11400	6900
Pubescent wheatgrass	3700	1700	11400	6900
Smooth bromegrass			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

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

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, statewide

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, statewide

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.

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 FSG's:

FSG ID	FSG Narrative
G064XY120N	Droughty Loam soils are shallower or coarser textured resulting in lower available water capacity and lower production potential.
G064XY500N	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 for soil surveys in South Dakota, Nebraska, and Wyoming counties in MLRA 64
NRCS Nebraska and Wyoming Field Office Technical Guides 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
Approval by:	Dave Schmidt
Approval Date:	9/17/04