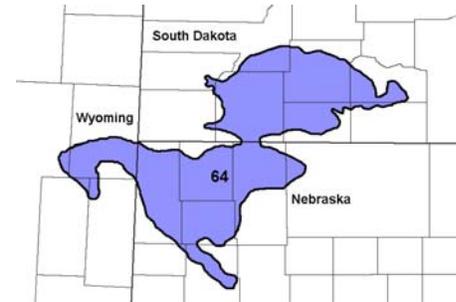


FORAGE SUITABILITY GROUP (FSG) Claypan

FSG No.: G064XY800NE

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



Physiographic Features

These soils are found on flood plain, outwash plain, terrace, and upland positions including fans and flats.

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	2950	3940
Slope (percent):	0	6
Flooding:		
Frequency:	None	Rare
Duration:	None	Very Brief
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Medium	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.

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
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	Sep 11	Sep 28

	From	To
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 mostly of moderately well and well drained, coarse to medium textured soils formed from sediments, residuum, and alluvium. They have claypan subsoils with slow and very slow permeability. The underlying material and lower part of the subsoil typically have high amounts of soluble salts and are sodic.

Drainage Class:	Somewhat poorly drained	To	Well drained
Permeability Class: (0 - 40 inches)	Slow	To	Very slow
Frost Action Class:	Low	To	High

	<u>Minimum</u>	<u>Maximum</u>
Depth:	20	
Surface Fragments >3" (% Cover):	0	3
Organic Matter (percent): (surface layer)	1.0	4.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	4	16
Sodium Absorption Ratio: (0 - 12 inches)	13	20
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	5.6	8.4
Available Water Capacity (inches): (0 - 60 inches)	4	8
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	6

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

Beckton	Mosher	Whitelake	Wortman
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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>Legumes</u>	<u>Symbol</u>	
Beardless wildrye	LETR5	F	Alfalfa	MESA	F
Crested wheatgrass	AGCR	F			
Green needlegrass	NAVI	F			
Intermediate wheatgrass	THIN	F			
Newhy hybrid wheatgrass		F			
Pubescent wheatgrass	THIN	F			
Russian wildrye	PSJU3	F			
Slender wheatgrass	ELTR7	F			
Smooth bromegrass	BRINI2	F			
Tall wheatgrass	THPO7	G			
Western wheatgrass	PASM	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

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	Management Intensity	
	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)
Alfalfa	3700	1800
Alfalfa/Intermediate wheatgrass	3000	1500
Intermediate wheatgrass	3000	1500
Tall wheatgrass	2900	1300
Western wheatgrass	1920	900

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

<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, statewide

<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

Soil Limitations

These soils have severe limitations to the production of climatically adapted forage species. The claypan and the soluble salts and sodicity in the subsoil produce an unfavorable rooting environment, limiting species selection and production potential.

Management Interpretations

Selecting forage species that are tolerant of salinity and sodicity and can root in dense, clayey subsoils can reduce the impact on yields.

FSG Documentation

Similar FSG's:

<u>FSG ID</u>	<u>FSG Narrative</u>
G064XY210N	Clayey subsoils are less saline and/or sodic and have a more favorable rooting zone.

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:

<u>Original Author:</u>	Tim Nordquist
<u>Original Date:</u>	4/15/02
<u>Approval by:</u>	Dave Schmidt
<u>Approval Date:</u>	9/20/04