

FORAGE SUITABILITY GROUP CLAYPAN

FSG No.: G063AY800SD

Major Land Resource Area: 63A - Northern Rolling Pierre Shale Plains

Physiographic Features

The soils in this group are found on flood plains, terraces, and upland slopes, fans, and flats.

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1300	2950
Slope (percent):	0	6
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Medium	Very 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 63A. Average annual precipitation for all climate stations listed below is about 17 inches. About 77 percent of that occurs during the months of April through September. On average there are about 25 days with greater than .1 inches of precipitation during that same time period.

Average annual snowfall ranges from 24 inches at Midland to 48 inches at Milesville. Snow cover at depths greater than 1 inch range from 27 days at Midland to 82 days at Timber Lake.

Average July temperatures across the MLRA are about 75⁰F and average January temperatures are about 17⁰F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -37 at Kennebec and a high of 114 at both Kennebec and Midland. The MLRA lies in USDA Plant Hardiness Zones 4a, 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)	129	162
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)	May 20	May 04
Last Frost in Spring (32 deg): (1 year in 10 later than)	May 31	May 16
First Frost in Fall (32 deg): (1 year in 10 earlier than)	Sep 09	Sep 24
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	Sep 17	Oct 01
Length of Growing Season (32 deg) (days): (9 years in 10 at least)	110	139
Growing Degree Days (40 deg):	4442	5149
Growing Degree Days (50 deg):	2517	3083
Annual Minimum Temperature:	-30	-15
Mean annual precipitation (inches):	16	18

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	0.10	0.09	0.31	0.82	1.44	1.55	0.90	0.64	0.41	0.30	0.08	0.16
Precip. More Than	0.60	0.79	2.37	3.46	3.82	4.55	3.58	2.46	1.98	2.06	1.07	0.91
Monthly Average:	0.30	0.42	1.20	1.99	2.86	3.06	2.23	1.80	1.31	1.12	0.48	0.45
Temp. Min.	3.9	9.7	20.0	32.9	44.0	53.9	59.6	57.3	46.4	35.5	20.8	7.9
Temp. Max.	32.8	38.6	48.3	63.1	74.1	83.8	92.2	90.6	79.3	66.4	48.4	35.9
Temp. Avg.	17.1	22.9	33.0	46.7	58.0	68.0	75.0	73.0	61.7	49.6	33.5	20.5

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
SD5691	Mobridge SD	1961	1990
SD8307	Timber Lake SD	1961	1990
SD6170	Oahe Dam SD	1961	1990
SD5506	Midland SD	1961	1990
SD5544	Milesville SD	1961	1990
SD6552	Philip SD	1961	1990
SD5891	Murdo SD	1961	1990
SD4516	Kennebec SD	1961	1990

Soil Interpretations

This group consists of moderately well and well drained, medium textured soils formed from alluvium, residuum, and clayey sediments. 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:	Moderately well drained	To	Well drained
Permeability Class: (0 - 40 inches)	Very slow	To	Slow
Frost Action Class:	Low	To	Moderate

	<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)	0	16
Sodium Absorption Ratio: (0 - 12 inches)	0	20
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	6.6	8.4
Available Water Capacity (inches): (0 - 60 inches)	4	8
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	9

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 at <http://plants.usda.gov/>.

Claypan

Pastureland and Hayland Interpretations

Cool Season Grasses

Beardless wildrye	F
Crested wheatgrass	F
Green needlegrass	F
Intermediate wheatgrass	F
Newhy hybrid wheatgrass	F
Pubescent wheatgrass	F
Russian wildrye	F
Slender wheatgrass	F
Smooth brome grass	F
Tall wheatgrass	G
Western wheatgrass	G

Legumes

Alfalfa	F
Sweetclover	F

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	4200	1900
Alfalfa/Crested wheatgrass	3000	1500
Alfalfa/Intermediate	3500	1600
Alfalfa/Pubescent wheatgrass	3500	1600
Crested wheatgrass	3000	1400
Intermediate wheatgrass	3200	1400
Pubescent wheatgrass	3200	1400
Western wheatgrass	2200	1000

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

Claypan

Pastureland and Hayland Interpretations

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

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

The impact on yields can be reduced by selecting forage species that are tolerant of salinity and sodicity and can root in dense, clayey subsoils.

FSG Documentation

Similar FSG's:

FSG ID	FSG Narrative
G063AY210SD	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 (NASIS) for soil surveys in South Dakota counties in MLRA 63A
 South Dakota NRCS South Dakota Technical Guides
 NRCS National Range and Pasture Handbook
 Various South Dakota 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: South Dakota

Forage Suitability Group Approval

Original Author: Tim Nordquist
Original Date: 4/5/02
Approval by: Dave Schmidt
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