FORAGE SUITABILITY GROUP
DROUGHTY LOAM

FSG No.: G063BY120SD

Major Land Resource Area: 63B - Southern Rolling Pierre Shale Plains

Physiographic Features
Droughty Loam soils are found across a spectrum of positions. They are found on upland slopes, on fans and stream terraces and terrace remnants, and on flood plains.

	Minimum	Maximum
Elevation (feet):	1300	2000
Slope (percent):	0	11
Flooding:		
Frequency:	None	Occasional
Duration:	None	Brief
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Low	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 timeframe. 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, Nebraska (NE,) to 44 inches at Winner, South Dakota (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 76^0F and average January temperatures are about 17^0F. 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):	128	152
(9 years in 10 at least)		
Last Killing Freeze in Spring (28 deg):	May 20	May 08
(1 year in 10 later than)		
Last Frost in Spring (32 deg):	Jun 09	May 17
(1 year in 10 later than)		
First Frost in Fall (32 deg):	Sep 01	Sep 21
(1 year in 10 earlier than)		
First Killing Freeze in Fall (28 deg):	Sep 19	Sep 30
(1 year in 10 earlier than)		
Length of Growing Season (32 deg) (days):	92	131
(9 years in 10 at least)		
Growing Degree Days (40 deg):	4526	5505

	From	To
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 of very deep, mostly somewhat excessively to well drained, medium to moderately course textured soils. Available water capacity is moderate due to the moderately coarse surface textures or moderate depths to sand and gravel.

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

	Minimum	**Maximum**
Depth:	72	
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	0
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	5.6	8.4
Available Water Capacity (inches): (0 - 60 inches)	6	9
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	20

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	Dryland	Irrigated
Crested wheatgrass	G	NS
Green needlegrass	G	NS
Intermediate wheatgrass	G	G
Meadow bromegrass	G	G
Orchardgrass	F	G
Pubescent wheatgrass	G	G
Russian wildrye	G	NS
Smooth bromegrass	G	G
Tall wheatgrass	F	NS
Western wheatgrass	G	NS

Warm Season Grasses	Dryland	Irrigated
Big bluestem	G	G
Indiangrass	F	G
Little bluestem	G	NS
Prairie sandreed	F	NS
Sand bluestem	F	NS
Sideoats grama	G	NS
Switchgrass	F	G

Legumes	Dryland	Irrigated
Alfalfa	G	G
Birdsfoot trefoil	NS	G
Cicer milkvetch	G	F
Purple prairieclover	G	NS
Red clover	F	G
White prairieclover	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	Management Intensity		Management Intensity	
	High (lbs/ac)	Low (lbs/ac)	High (lbs/ac)	Low (lbs/ac)
Alfalfa	6900	2900		
Alfalfa/Intermediate wheatgrass	6000	2600	14300	8600
Alfalfa/Smooth bromegrass	6000	2600	14300	8600
Intermediate wheatgrass	4300	2300	11400	6900
Smooth bromegrass	4000	2300	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: SD0001
Growth Curve Name: Alfalfa
Growth Curve Description: Alfalfa, MLRA's 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, 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

The primary limitation for these soils is their moderate available water capacity which limits plant growth during periods of moisture deficit. On steeper slopes, water erosion is a potential problem during stand establishment and livestock trail erosion is a potential problem on established stands. Also, wind erosion is a potential problem during stand establishment on moderately coarse textured soils.

Management Interpretations

Selecting forage species that are tolerant to periods of drought and inadequate soil moisture can reduce the impact on yields of the moderate available water capacity of these soils. Including sod forming grass species in stands, especially on steeper slopes, will reduce the potential for sheet and rill erosion. Incorporate both wind and water erosion control practices during the establishment period. 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
G063BY100S	Loamy soils have greater available water capacity and greater production potential.
G063BY130S	Very Droughty Loams have lower available water capacity and lower 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: Nebraska and South Dakota

Forage Suitability Group Approval

Original Author: Tim Nordquist
Original Date: 4/3/02
Approval by: Dave Schmidt
Approval Date: 8/22/03