

## FORAGE SUITABILITY GROUP (FSG)

### Steep Loam

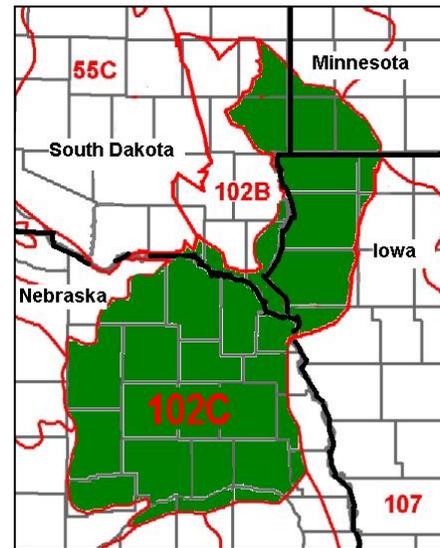
**FSG No.:** G102CY109NE

**Major Land Resource Area (MLRA):** 102C - Loess Uplands

#### Physiographic Features

The soils in this group are located on moderately steep to steep upland positions.

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	980	1640
<b>Slope (percent):</b>	11	30
<b>Flooding:</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Ponding:</b>		
<b>Depth (inches):</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	High	Very high



#### Climatic Features

Annual precipitation varies widely from year to year in MLRA 102C. Average annual precipitation for all climate stations listed below is about 27 inches. About 73 percent of the annual precipitation occurs during the months of April through September. On average, there are about 33 days with greater than .1 inches of precipitation during the same time period. Annual precipitation and temperature increase from the northwest to the southeast in the MLRA. 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, to 36 inches at Wakefield. Days with snow cover at depths greater than 1 inch range from 9 days at Creighton to 55 days at Wakefield.

Average July temperatures are about 76°F and average January temperatures are about 20°F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -36 at Creighton and a high of 108 recorded at both Columbus and Wakefield. The MLRA lies mostly in USDA Plant Hardiness Zone 4b with some small areas of warmer 5a.

At Norfolk, NE, the average annual wind speeds are about 11.2 MPH. The highest wind speeds occur during March and April. It is cloudy about 146 days a year. Average morning relative humidity in June is about 82 percent, and average afternoon humidity is 55 percent.

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>.

	<b>From</b>	<b>To</b>
<b>Freeze-free period (28 deg) (days):</b> (9 years in 10 at least)	138	168
<b>Last Killing Freeze in Spring (28 deg):</b> (1 year in 10 later than)	May 12	Apr 25
<b>Last Frost in Spring (32 deg):</b> (1 year in 10 later than)	May 20	May 10
<b>First Frost in Fall (32 deg):</b> (1 year in 10 earlier than)	Sep 12	Sep 23

	<b>From</b>	<b>To</b>
<b>First Killing Freeze in Fall (28 deg):</b> (1 year in 10 earlier than)	Sep 20	Oct 04
<b>Length of Growing Season (32 deg) (days):</b> (9 years in 10 at least)	126	146
<b>Growing Degree Days (40 deg):</b>	4833	5730
<b>Growing Degree Days (50 deg):</b>	2815	3551
<b>Annual Minimum Temperature:</b>	-25	-15
<b>Mean annual precipitation (inches):</b>	23	30

**Monthly precipitation (inches) and temperature (F):**

<b>2 years in 10:</b>	<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>
<b>Precip. Less Than</b>	0.15	0.17	0.51	0.83	1.92	1.98	1.71	1.35	1.07	0.44	0.15	0.30
<b>Precip. More Than</b>	1.13	1.20	3.39	3.93	5.93	6.63	4.33	5.39	5.53	3.85	2.16	1.47
<b>Monthly Average:</b>	0.55	0.76	2.04	2.53	4.03	4.20	3.09	3.03	3.00	2.02	1.18	0.86
<b>Temp. Min.</b>	5.3	10.6	23.0	35.4	46.5	56.8	61.9	58.7	48.4	35.6	23.8	10.7
<b>Temp. Max.</b>	32.4	38.2	50.2	65.2	75.6	84.8	88.7	86.1	77.7	66.5	49.7	35.3
<b>Temp. Avg.</b>	19.7	25.3	36.8	50.6	61.6	71.3	75.9	73.1	63.9	52.3	37.1	23.5

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
NE1825	Columbus, NE	1961	1990
NE1990	Creighton, NE	1961	1990
NE3050	Fremont, NE	1961	1990
NE6018	NE Nebraska Experiment	1964	1990
NE8110	Stanton, NE	1961	1990
NE8480	Tekamah, NE	1961	1990
NE8915	Wakefield, NE	1961	1990
NE8935	Walthill, NE	1961	1990

**Soil Interpretations**

This group consists of well drained, moderately coarse to moderately fine textured soils formed mostly from loess. Available water capacity is high and permeability is moderately slow to moderate.

<b>Drainage Class:</b>	Well drained	To	Well drained
<b>Permeability Class:</b> (0 - 40 inches)	Moderately slow	To	Moderately rapid
<b>Frost Action Class:</b>	Moderate	To	High

	<u>Minimum</u>	<u>Maximum</u>
<b>Depth:</b>	60	
<b>Surface Fragments &gt;3" (% Cover):</b>		
<b>Organic Matter (percent):</b> (surface layer)	0.5	8.0
<b>Electrical Conductivity (mmhos/cm):</b> (0 - 24 inches)	0	2
<b>Sodium Absorption Ratio:</b> (0 - 12 inches)	0	0
<b>Soil Reaction (1:1) Water (pH):</b> (0 - 12 inches)	5.6	8.4
<b>Available Water Capacity (inches):</b> (0 - 60 inches)	9	
<b>Calcium Carbonate Equivalent (percent):</b> (0 - 12 inches)	0	10

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

Alcester	Geary variant	Moody	Shindler
Crofton	Hersh	Nora	Steinauer
Geary	Houdek	Nora variant	

**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>.

<b>Cool Season Grasses</b>	<b><u>Symbol</u></b>		<b>Legumes</b>	<b><u>Symbol</u></b>	
Intermediate wheatgrass	THIN6	G	Alfalfa	MESA	F
Pubescent wheatgrass	THIN6	G	Cicer milkvetch	ASCI4	F
Smooth brome grass	BRINI2	G	Purple prairieclover	DAPUP	F
Tall fescue	LOAR10	F	Red clover	TRPR2	G
Tall wheatgrass	THPO7	F	White prairieclover	DACAC	F
Western wheatgrass		G			
<b>Warm Season Grasses</b>	<b><u>Symbol</u></b>				
Big bluestem	ANGE	G			
Indiangrass	SONU2	G			
Little bluestem	SCSC	G			
Sideoats grama	BOCU	G			
Switchgrass	PAVIV	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. 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 50percent.

<b>Forage Crop</b>	<b><u>Dryland</u></b>	
	<b>Management Intensity</b>	
	<b><u>Low</u></b>	<b><u>High</u></b>
	<b>(lbs/ac)</b>	<b>(lbs/ac)</b>
Alfalfa	3700	8300
Alfalfa/Intermediate wheatgrass	3400	7700
Alfalfa/Smooth brome grass	3400	7700
Big bluestem	2900	7700
Intermediate wheatgrass	2900	5400
Smooth brome grass	2900	5400

### 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 102B, 102C, 63B, 66, 65

<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	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

<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

**Growth Curve Number:** SD0005  
**Growth Curve Name:** Warm season grass  
**Growth Curve Description:** Warm 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	0	10	40	35	15	0	0	0	0

### Soil Limitations

Slope - The slope of these soils range from 15 to 30 percent with high and very high runoff potential, resulting in less of the water entering the soil and being available for plant growth. The potential for water erosion on these steep slopes is high when establishing new stands or renovating stands, and in thin existing stands with exposed bare ground. Livestock trail erosion can be a severe problem. Also, the steep slopes can result in uneven grazing by livestock, and makes travel with wheeled vehicles dangerous.

### Management Interpretations

Slope - including sod forming grass species in new seedings will reduce the potential for sheet and rill erosion. Incorporate erosion control practices during the establishment period. Locate facilitating practices such as fences, lanes, and water developments to control livestock movement to more evenly distribute grazing and reduce livestock trailing perpendicular to steeper slopes.

### FSG Documentation

#### Similar FSG's:

<u>FSG ID</u>	<u>FSG Narrative</u>
G102CY100NE	Loamy soils are less steeply sloping.

#### 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 Nebraska and South Dakota counties in MLRA 102C  
 NRCS Nebraska Field Office Technical Guide and South Dakota Technical Guide  
 NRCS National Range and Pasture Handbook  
 Various 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: 6/8/2001  
Approval by: Dave Schmidt  
Approval Date: 1/12/05