

## FORAGE SUITABILITY GROUP (FSG)

### Saline

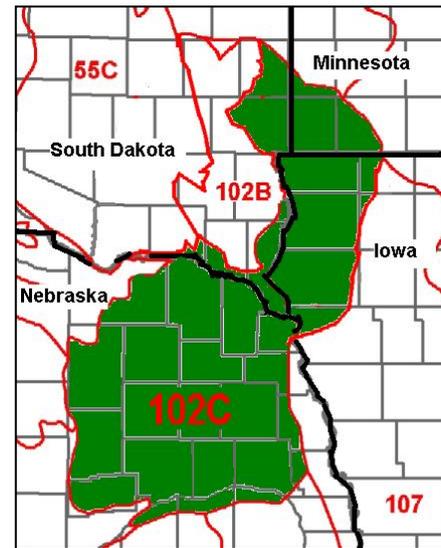
**FSG No.:** G102CY895NE

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

#### Physiographic Features

Most of these soils are found on level and nearly level flood plains and terraces.

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	980	1640
<b>Slope (percent):</b>	0	2
<b>Flooding:</b>		
<b>Frequency:</b>	None	Occasional
<b>Duration:</b>	None	Brief
<b>Ponding:</b>		
<b>Depth (inches):</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	Very low	Medium



#### 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, Nebraska (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

	<u>From</u>	<u>To</u>
<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

<b><u>Climate Station</u></b>	<b><u>Location</u></b>	<b><u>From</u></b>	<b><u>To</u></b>
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 somewhat poorly and poorly drained soils with elevated salinity.

<b>Drainage Class:</b>	Poorly drained	To	Somewhat poorly drained
<b>Permeability Class:</b> (0 - 40 inches)	Very slow	To	Moderate
<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)	1.0	5.0
<b>Electrical Conductivity (mmhos/cm):</b> (0 - 24 inches)	8	16
<b>Sodium Absorption Ratio:</b> (0 - 12 inches)	9	18
<b>Soil Reaction (1:1) Water (pH):</b> (0 - 12 inches)	6.6	8.4
<b>Available Water Capacity (inches):</b> (0 - 60 inches)	9	
<b>Calcium Carbonate Equivalent (percent):</b> (0 - 12 inches)	3	10

**Soil Map Unit List**

Gayville	Gibbon	Salmo
Gayville variant	Napa	Wann

### 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>.

<u>Cool Season Grasses</u>			<u>Warm Season Grasses</u>		
	<u>Symbol</u>			<u>Symbol</u>	
Beardless wildrye	LETR5	G	Alkali sacaton	SPAI	F
Creeping foxtail	ALAR	F	Switchgrass	PAVIV	F
Intermediate wheatgrass	THIN6	F	<u>Legumes</u>		
Newhy hybrid wheatgrass		G	Alfalfa	MESA	F
Pubescent wheatgrass	THIN6	F	Alsike clover	TRHY	F
Reed canarygrass	PHAR3	F	Birdsfoot trefoil	LOCO6	F
Slender wheatgrass	ELTR7	G	Cicer milkvetch	ASCI4	F
Tall fescue	LOAR10	G			
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. 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.

<u>Forage Crop</u>	<u>Dryland</u>		<u>Irrigated</u>	
	<u>Management Intensity</u>		<u>Management Intensity</u>	
	<u>Low</u> (lbs/ac)	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)	<u>High</u> (lbs/ac)
Switchgrass	2000	3400		
Tall wheatgrass	3400	5700		
Western wheatgrass	2000	3400		

### 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: 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

<b>Percent Production by Month</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>
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. Species selection and productivity are severely limited by the high salinity. Also, these soils are somewhat poorly and poorly drained and will experience periods when trafficability will be difficult or impossible. These soils are subject to compaction if grazed or machinery is operated on them when wet. Drainage also limits species selection.

**Management Interpretations**

When establishing new stands or renovating stands select species that are tolerant of elevated salinity levels and that are tolerant of somewhat poorly and poorly drained soils. Exclude livestock and machinery during extended periods of soil wetness to reduce soil compaction.

**FSG Documentation**

**Similar FSG's:**

**FSG ID**

G102CY700NE

**FSG Narrative**

Subirrigated soils do not have restrictive levels of salinity.

G102CY900NE

Wet soils do not have restrictive levels of salinity.

**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:**

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Original Date: 6/8/2001  
Approval by: Dave Schmidt  
Approval Date: 1/13/05