

FORAGE SUITABILITY GROUP

Clayey

FSG No.: G071XY210NE

Major Land Resource Area: 071X -Central Nebraska Loess Hills

Physiographic Features

The soils in this group are found on upland positions and on stream terraces.

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1640	2600
Slope (percent):	0	7
Flooding:		
Frequency:	None	Rare
Duration:	None	Very Brief
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Low	Very high

Climatic Features

Average annual precipitation for all climate stations listed below is about 25 inches. About 76 percent of the precipitation received in MLRA 71 falls during the months of April through September. On average there are about 30 days during that period that receive greater than .1 inches. 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 14 inches at Greeley, NE, to 36 inches at Loup City, NE. Snow cover at depths greater than 1 inch range from a just 2 days per year at Greeley to a high of 49 days per year at Central City, NE.

Average January temperatures for the listed climate stations during the years 1961 to 1990 are about 23 degree F., and average July temperatures are about 76 degrees. Recorded temperature extremes are a low of -36 at Broken Bow, NE, and a high of 106 at North Platte, NE, which lies just west of the MLRA. The MLRA lies in USDA Plant Hardiness Zones 4b and 5a.

It is cloudy an average of 140 days per year at Grand Island, and 141 days a year at North Platte. Average annual wind speeds are about 11.8 MPH at Grand Island and 10.1 at North Platte. Highest average wind speeds occur during the spring. At Grand Island average morning relative humidity in June is about 82 percent and average afternoon humidity in June is about 55 percent. At North Platte they are 84 and 57 percent respectively.

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	174
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)	May 18	Apr 27
Last Frost in Spring (32 deg): (1 year in 10 later than)	May 28	May 08

First Frost in Fall (32 deg): (1 year in 10 earlier than)	From Sep 10	To Sep 26
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	Sep 14	Oct 09
Length of Growing Season (32 deg)(days): (9 years in 10 at least)	113	145
Growing Degree Days (40 deg):	5020	5830
Growing Degree Days (50 deg):	2920	3590
Annual Minimum Temperature:	-25	-15
Mean annual precipitation (inches):	22	26

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	0.18	0.09	0.51	0.66	1.86	2.14	1.81	1.32	0.65	0.36	0.13	0.18
Precip. More Than	0.81	1.13	3.39	3.98	5.38	5.84	4.37	3.90	3.74	2.44	1.92	1.18
Monthly Average:	0.43	0.32	1.75	2.40	3.67	3.99	3.30	2.83	2.50	1.46	0.96	0.65
Temp. Min.	9.2	14.6	22.9	33.8	45.2	54.8	60.8	58.4	47.9	35.2	22.2	12.2
Temp. Max.	36.8	42.6	51.8	64.6	73.9	84.4	89.3	87.2	77.6	66.8	50.1	39.1
Temp. Avg.	22.5	27.9	37.4	50.2	60.5	70.3	75.5	73.1	63.5	52.1	37.1	25.5

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
NE1200	Broken Bow, NE	1961	1990
NE6040	North Loup, NE	1961	1990
NE3425	Greely, NE	1961	1990
NE4985	Loup City, NE	1961	1990
NE3365	Gothengurg, NE	1961	1990
NE1560	Central City, NE	1961	1990
NE4335	Kearny, NE	1961	1990

Soil Interpretations

The clayey subsoil group consists moderately well drained, very deep, medium to fine textured soils formed from loess or alluvium. Available water capacity is high, and permeability is very slow to slow.

Some of these soils have medium surface textures, but all have clayey subsoils.

Drainage Class:	Moderately well drained	To	Moderately well drained
Permeability Class: (0 - 40 inches)	Slow	To	Very slow
Frost Action Class:	Moderate	To	Low

	<u>Minimum</u>	<u>Maximum</u>
Depth:	72	
Surface Fragments >3" (% Cover):	0	0
Organic Matter (percent): (surface layer)	1.0	4.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	0	8
Sodium Absorption Ratio: (0 - 12 inches)	0	13
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	5.6	7.8

	<u>Minimum</u>	<u>Maximum</u>
Available Water Capacity (inches): (0 - 60 inches)	9	12
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	3

Soil Series List

Crete

Detroit

Wood river

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>Plant Symbol</u>	<u>Dryland</u>	<u>Irrigated</u>
Canada wildrye	ELCA4	F	NS
Creeping foxtail	ALAR	NS	G
Crested wheatgrass	AGCR	F	NS
Intermediate wheatgrass	THIN6	G	F
Meadow brome	BRBI2	NS	G
Orchardgrass	DAGL	NS	G
Pubescent wheatgrass	THIN6	G	F
Reed canarygrass	PHAR3	NS	F
Smooth brome	BRINI2	F	G
Tall fescue	LOAR10	F	F
Tall wheatgrass	THPO7	F	F
Western wheatgrass	PASM	G	NS

Warm Season Grasses

Big bluestem	ANGE	F	F
Indiangrass	SONU2	F	F
Little bluestem	SCSC	G	NS
Sideoats grama	BOCU	G	NS
Switchgrass	PAVIV	F	F

Legumes

Alfalfa	MESA	G	G
Birdsfoot trefoil	LOCO6	NS	F
Cicer milkvetch	ASCI4	F	F
Red clover	TRPR2	NS	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

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. 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	<u>Dryland</u>		<u>Irrigated</u>	
	Management Intensity		Management Intensity	
	<u>Low</u> (lbs/ac)	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)	<u>High</u> (lbs/ac)
Alfalfa	2600	10300	5100	22900
Alfalfa/Cool Season Grass	1800	9000	5100	21500
Big bluestem	2100	6400	3900	14300
Intermediate wheatgrass	1800	9000	3900	17100
Smooth brome grass	1800	7700	3900	15700
Switchgrass	2100	5900	3900	12900
Western wheatgrass	2100	3900		

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: NE0001

Growth Curve Name: Alfalfa

Growth Curve Description: MLRAs 107, 106, 75, irrigated 73, 72

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	30	30	20	15	5	0	0	0

Growth Curve Number: NE0002

Growth Curve Name: Cool-season grass fertilized early

Growth Curve Description: MLRAs 107, 106, 75, irrigated 73, 72

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	5	5	10	0	0	0

Growth Curve Number: NE0003

Growth Curve Name: Warm-season grass

Growth Curve Description: 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	15	35	30	15	5	0	0	0

Growth Curve Number: NE0005

Growth Curve Name: Alfalfa

Growth Curve Description: MLRAs 73, 72 dryland

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	35	35	20	10	0	0	0	0

Growth Curve Number: NE0006
Growth Curve Name: Cool-season grass fertilized early
Growth Curve Description: MLRAs 73, 72 dryland

<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	35	0	5	10	0	0	0

Soil Limitations

Drainage

- Moderately well drained soils will be prone to compaction and plant damage if grazed or machinery is operated on them during wet periods.

Permeability

- The very slow to slow permeability results in high and very high runoff potential on sloping soils. These heavy clay soils provide a less than ideal rooting zone.

Management Interpretations

Drainage

- Exclude livestock and machinery during extended wet periods to reduce compaction.

Permeability

- Include sod-forming species in plantings to reduce runoff. Select species adapted to heavy, clayey soils.

FSG Documentation

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) database for soil surveys in Nebraska counties in MLRA 71
Nebraska NRCS Field Office 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:
NE

Forage Suitability Group Approval:

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