

FORAGE SUITABILITY GROUP

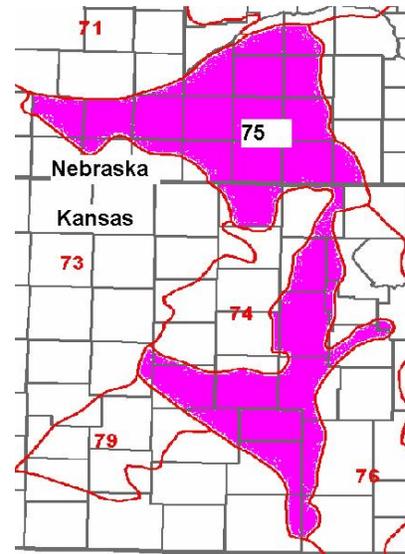
Clayey

FSG No.: G075XY210NE
Major Land Resource Area: 75 - Central Loess Plains

Physiographic Features

Most of the soils in this group are found on uplands and terraces with a few found on flood plains.

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1640	1970
Slope (percent):	0	25
Flooding:		
Frequency:	None	Occasional
Duration:	None	Brief
Ponding:		
Depth (inches):		
Frequency:	None	Occasional
Duration:	None	Brief
Runoff Class:	Very low	Very high



Climatic Features

Average annual precipitation for all climate stations listed below in MLRA 75 is about 30 inches. Most of the precipitation received occurs during midspring to midautumn. On average there are about 46 days a year with greater than .1 inches of precipitation.

Average annual snowfall ranges from 5.2 inches at Marion Lake, KS, to 29.4 inches at David City, NE. Snow cover at depths greater than 1 inch range from a low of just 2 days per year at Florence and Marion Lake in Kansas to a high of 44 days per year at Crete and Hebron in Nebraska.

Average daily temperatures in MLRA 75 increase from the north to the south. Average January temperatures range from the low 20s in the northern part of the MLRA to the low 30s in the south. Average July temperatures range from about 77 degrees in the north to about 81 degrees in the south. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -31 at Minden, NE and a high of 112 recorded at several locations in Kansas. The MLRA lies in USDA Plant Hardiness Zones 5a, 5b, and 6a.

Average annual wind speeds are about 12 MPH, with the highest wind speeds occurring during March and April. It is cloudy about 140 days a year. Average morning relative humidity in June is about 83 percent and average afternoon humidity in June is about 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>

	From	To
Freeze-free period (28 deg)(days): (9 years in 10 at least)	159	192
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)	May 02	Apr 16
Last Frost in Spring (32 deg): (1 year in 10 later than)	May 16	Apr 26

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First Frost in Fall (32 deg): (1 year in 10 earlier than)	From Sep 16	To Oct 08
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	Oct 02	Oct 20
Length of Growing Season (32 deg)(days): (9 years in 10 at least)	134	172
Growing Degree Days (40 deg):	5576	7337
Growing Degree Days (50 deg):	3406	4686
Annual Minimum Temperature:	-20	-5
Mean annual precipitation (inches):	25	35

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	0.17	0.18	0.54	0.95	1.63	1.69	1.74	1.07	1.12	0.53	0.22	0.21
Precip. More Than	1.43	1.76	4.11	4.58	6.18	8.64	5.15	5.18	6.11	4.88	3.21	1.96
Monthly Average:	0.64	0.86	2.27	2.67	4.29	4.58	3.38	3.40	3.44	2.36	1.46	0.98
Temp. Min.	10.4	15.3	26.0	38.5	49.8	59.6	64.9	62.1	52.6	40.5	27.5	14.9
Temp. Max.	43.6	49.7	60.7	71.7	79.2	88.1	93.9	92.6	83.9	73.6	58.3	46.6
Temp. Avg.	23.3	28.3	38.1	49.1	58.2	67.2	72.2	69.9	61.6	51.1	37.9	26.8

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
NE2020	Crete, NE	1961	1990
NE2205	David City, NE	1961	1990
NE3660	Hastings, NE	1961	1990
NE3735	Hebron, NE	1961	1990
NE5565	Minden, NE	1961	1990
KS0010	Abilene, KS	1961	1990
KS0682	Belleville, KS	1961	1990
KS2773	Florence, KS	1961	1990
KS3594	Herington, KS	1961	1990
KS5039	Marion Lake, KS	1966	1990
KS7796	Sterling, KS	1961	1990
KS8964	Winfield, KS	1961	1990

Soil Interpretations

This group consists of somewhat poorly to well drained, fine to moderately fine textured soils formed mostly from loess and alluvium. They are moderately deep to very deep, permeability is very slow to moderately slow, and available water capacity is low to high.

Drainage Class:	Somewhat poorly drained	To	Well drained
Permeability Class: (0 - 40 inches)	Moderately slow	To	Very slow
Frost Action Class:	Low	To	High

	<u>Minimum</u>	<u>Maximum</u>
Depth:	20	
Surface Fragments >3" (% Cover):	0	3
Organic Matter (percent): (surface layer)	1.0	6.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	0	4

	<u>Minimum</u>	<u>Maximum</u>
Sodium Absorption Ratio: (0 - 12 inches)	0	15
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	5.1	8.4
Available Water Capacity (inches): (0 - 60 inches)	4	12
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	15

<u>Mapunit Component</u>	(Some phases of these soils may also occur in other FSGs)		
Benfield	Dwight	Longford	Solomon
Chase	Goessel	Mayberry	Sutphen
Clime	Irwin	Rosehill	Tabler
Crete	Labette	Smokyhill	Tully
Detroit	Ladysmith	Smolan	Wymore

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/>

<u>Cool Season Grasses</u>	<u>Symbol</u>		<u>Warm Season</u>	<u>Symbol</u>	
Canada wildrye	ELCA4	F	Bermudagrass	CYDA	G
Intermediate	THIN6	G	Big bluestem	ANGE	G
Meadow bromegrass	BRBI2	F	Eastern gamagrass	TRDA3	F
Orchardgrass	DAGL	F	Indiangrass	SONU2	G
Pubescent wheatgrass	THIN6	G	Little bluestem	SCSC	F
Smooth bromegrass	BRINI2	G	Sideoats grama	BOCU	F
Tall fescue	LOAR10	G	Switchgrass	PAVIV	G
Tall wheatgrass	THPO7	F	<u>Legumes</u>		
Western wheatgrass	PASM	G	Alfalfa	MESA	G
			Birdsfoot trefoil	LOCO6	F
			Cicer milkvetch	ASCI4	F
			Red clover	TRPR2	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	<u>Dryland</u>		<u>Irrigated</u>	
	Management Intensity		Management Intensity	
	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)
Alfalfa	14300	4900	20000	7700
Alfalfa/Cool Season Grass	14300	3400	18600	7100
Big bluestem	11400	2900	17100	6600
Eastern gamagrass			23000	6600
Smooth brome	10000	3100	17100	77100
Switchgrass	11400	2900	15700	5100
Tall fescue	9100	3400	15700	6600

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: NE0601

Growth Curve Name: Alfalfa

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

<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	25	25	20	15	5	0	0	0

Growth Curve Number: NE0602

Growth Curve Name: Cool-season grass

Growth Curve Description: Cool-season grass fertilized early - MLRAs 107, 106, 75, irrigated 73, 72

<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	5	10	35	30	5	5	10	0	0	0

Growth Curve Number: NE0603

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	5	15	30	30	15	5	0	0	0

Growth Curve Number: NE0604

Growth Curve Name: Eastern gamagrass

Growth Curve Description: Eastern gamagrass - 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	35	40	15	0	0	0	0	0

Soil Limitations

Water Holding Capacity

- Water holding capacity ranges from low to high on these soils. Forage production on soils of low and moderate water holding capacity will be noticeably affected during dry growing seasons.

Drainage

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

Permeability

- The very slow to moderately 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

Water holding capacity

- When establishing new stands on soils with moderate available water holding capacity select forage species that are tolerant to periods of drought and inadequate soil moisture.

Drainage

- On somewhat poorly and moderately well drained soils 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 and Kansas counties in MLRA 75
Nebraska and Kansas 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:

KS
NE

Forage Suitability Group Approval:

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