

## FORAGE SUITABILITY GROUP

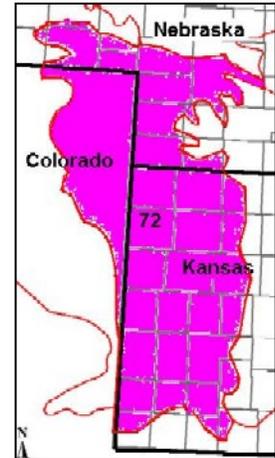
### Limy Upland

**FSG No.:** G072XY400KS

**Major Land Resource Area:** 072X - Central High Tableland

#### Physiographic Features

Most of the soils in this group are found in upland positions with a number located on hills, ridges, and side slopes. A few are located on fans and footslopes.



	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	2600	3900
<b>Slope (percent):</b>	0	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>	Negligible	Very high

#### Climatic Features

Average annual precipitation for all climate stations listed below in MLRA 72 is about 19 inches. About 77 percent of that precipitation falls during the months of April through September. On average there are about 24 days during that period that receive greater than .1 inches.

Average annual snowfall ranges from 17 inches at Syracuse, KS, to 37 inches at Lodgepole, NE. Snow cover at depths greater than 1 inch range from a low of 6 days per year at Burlington, CO to a high of 41 days at North Platte, NE.

Average January temperatures are about 28 degree F., and average July temperatures are about 77 degrees. Recorded temperature extremes for the listed climate stations during the years 1961 to 1990 are a low of -34 recorded at three Nebraska and one Kansas locations and a high of 113 recorded at Healy, KS. The MLRA lies in USDA Plant Hardiness Zones 5a, 5b, and 6a.

It is cloudy an average of 143 days a year at Goodland, KS. Average annual wind speeds are about 12.5 MPH with the highest averages occurring during the spring. Average morning relative humidity in June is about 82 percent and average afternoon humidity in June is about 42 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)	134	176
<b>Last Killing Freeze in Spring (28 deg):</b> (1 year in 10 later than)	May 14	Apr 28
<b>Last Frost in Spring (32 deg):</b> (1 year in 10 later than)	May 24	May 08
<b>First Frost in Fall (32 deg):</b> (1 year in 10 earlier than)	Sep 11	Oct 01

<b>First Killing Freeze in Fall (28 deg):</b> (1 year in 10 earlier than)	<b>From</b> Sep 16	<b>To</b> Oct 12
<b>Length of Growing Season (32 deg)(days):</b> (9 years in 10 at least)	118	152
<b>Growing Degree Days (40 deg):</b>	4880	6530
<b>Growing Degree Days (50 deg):</b>	2850	4420
<b>Annual Minimum Temperature:</b>	-20	-5
<b>Mean annual precipitation (inches):</b>	15	22

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

<b>2 years in 10:</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
<b>Precip. Less Than</b>	0.11	0.07	0.24	0.41	1.22	1.27	1.03	1.00	0.56	0.14	0.14	0.14
<b>Precip. More Than</b>	0.90	0.97	2.53	2.91	5.47	4.80	4.49	3.13	3.10	2.01	1.43	0.97
<b>Monthly Average:</b>	0.42	0.46	1.29	1.66	3.32	3.07	2.78	2.14	1.64	1.01	0.72	0.45
<b>Temp. Min.</b>	8.6	14.2	23.1	34.0	44.7	54.4	60.6	57.8	46.5	33.6	21.2	11.2
<b>Temp. Max.</b>	45.5	51.3	60.4	70.8	78.7	88.7	93.6	91.2	83.2	73.2	57.7	47.1
<b>Temp. Avg.</b>	27.9	33.2	40.8	51.4	61.0	71.2	77.2	74.8	65.4	53.8	39.7	30.1

<b><u>Climate Station</u></b>	<b><u>Location</u></b>	<b><u>From</u></b>	<b><u>To</u></b>
KS8038	Syracuse, KS	1961	1990
NE6065	North Platte, NE	1961	1990
KS0439	Atwood, KS	1961	1990
KS5127	McDonald, KS	1961	1990
CO4082	Holyoke, CO	1961	1990
NE4110	Imperial, NE	1961	1990
NE4900	Lodgepole, NE	1961	1990
KS3554	Healy, KS	1961	1990
KS3837	Hoxie, KS	1961	1990
KS7397	Sharon Springs, KS	1961	1990
CO1121	Burlington, CO	1961	1990
KS7922	Sublette, KS	1961	1990

**Soil Interpretations**

These are moderately deep to very deep, well drained, medium to moderately fine textured soils with elevated calcium carbonate levels near the soil surface. Permeability ranges from moderately slow to moderate, and available water capacities are mostly moderate to high.

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

	<b><u>Minimum</u></b>	<b><u>Maximum</u></b>
<b>Depth:</b>	20	
<b>Surface Fragments &gt;3" (% Cover):</b>	0	0
<b>Organic Matter (percent):</b> (surface layer)	0.0	3.0
<b>Electrical Conductivity (mmhos/cm):</b> (0 - 24 inches)	0	4
<b>Sodium Absorption Ratio:</b> (0 - 12 inches)	0	9

	<u>Minimum</u>	<u>Maximum</u>
<b>Soil Reaction (1:1) Water (pH):</b> (0 - 12 inches)	6.6	8.4
<b>Available Water Capacity (inches):</b> (0 - 60 inches)	4	13
<b>Calcium Carbonate Equivalent (percent):</b> (0 - 12 inches)	0	25

**Mapunit Component List** (Some phases of these soils may also occur in other FSGs)

Atchison	Elkader	Manvel	Sully
Campus	Keota	Minnequa	Wagonbed
Colby	Kim	Penden	
Coly	Kimst	Sidney	
Dioxice	Mansic	Sulco	

**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>Adaptation</u>
Crested wheatgrass	AGCR	G
Intermediate wheatgrass	THIN6	F
Pubescent wheatgrass	THIN6	F
Russian wildrye	PSJU3	F
Tall wheatgrass	THPO7	F
Western wheatgrass	PASM	G

**Warm Season Grasses**

Little bluestem	SCSC	F
Sideoats grama	BOCU	G
Switchgrass	PAVIV	F

**Legumes**

Alfalfa	MESA	G
Cicer milkvetch	ASCI4	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.

PASTURE AND HAYLAND INTERPRETATIONS

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	
	Low (lbs/ac)	High (lbs/ac)
Alfalfa	1300	10000
Alfalfa/Cool Season Grass	1300	10000
Intermediate wheatgrass	1300	4300
Little bluestem	800	2900
Sideoats grama	500	2000
Western wheatgrass	1300	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:** KS0003  
**Growth Curve Name:** Warm-season grass  
**Growth Curve Description:** 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	15	35	30	15	5	0	0	0

**Growth Curve Number:** KS0005  
**Growth Curve Name:** Alfalfa  
**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	0	35	35	20	10	0	0	0	0

**Growth Curve Number:** KS0006  
**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**

Lime

- The primary limitation to the soils in this group is the high lime content close to the soil surface. This reduces species choices and yield potential.

**Management Interpretations**

Lime

- When establishing new stands select forage species that are tolerant to the high lime levels inherent to these soils.

Slope

- Safe equipment operation is needed on steeper slopes.

Water erosion

- Include sod forming grass species in new seedings on steeper slopes to reduce sheet and rill erosion. Incorporate erosion control practices during the establishment period. Locate fences, lanes, water

**FSG Documentation**

**Similar FSGs:**

**FSG ID**

G072XY100KS

**FSG Narrative**

Loamy soils do not have as high a lime content near the surface and are more productive.

**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 Kansas, Nebraska, and Colorado counties in MLRA 72

Kansas, Nebraska, and Colorado NRCS Field Office Technical Guides

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:

CO

KS

NE

**Forage Suitability Group Approval:**

Original Author: Tim Nordquist

Original Date:

Approval by:

\_\_\_\_\_  
State Range Management Specialist

\_\_\_\_\_  
Date

\_\_\_\_\_  
State Range Management Specialist

\_\_\_\_\_  
Date