

FORAGE SUITABILITY GROUP

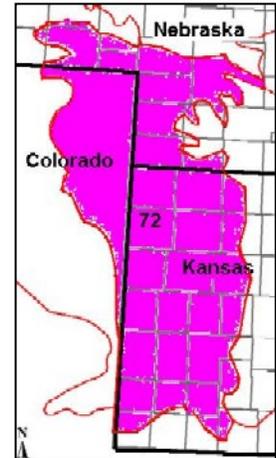
Clayey

FSG No.: G072XY210KS

Major Land Resource Area: 072X -Central High Tableland

Physiographic Features

The soils in this group are found on upland slopes, alluvial fans, terraces, low benches surrounding large enclosed basins or playas, and flood plains.



	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	2600	3900
Slope (percent):	0	12
Flooding:		
Frequency:	None	Occasional
Duration:	None	Brief
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Low	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. 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 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>

	From	To
Freeze-free period (28 deg)(days): (9 years in 10 at least)	134	176
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)	May 14	Apr 28
Last Frost in Spring (32 deg): (1 year in 10 later than)	May 24	May 08

	From	To
First Frost in Fall (32 deg): (1 year in 10 earlier than)	Sep 11	Oct 01
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	Sep 16	Oct 12
Length of Growing Season (32 deg)(days): (9 years in 10 at least)	118	152
Growing Degree Days (40 deg):	4880	6530
Growing Degree Days (50 deg):	2850	4420
Annual Minimum Temperature:	-20	-5
Mean annual precipitation (inches):	15	22

Monthly precipitation (inches) and temperature (F):

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

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
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

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

Some of these soils have medium surface textures, but all have clayey subsoils. Also, some of these soils are slightly saline.

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

	<u>Minimum</u>	<u>Maximum</u>
Depth:	20	
Surface Fragments >3" (% Cover):	0	0
Organic Matter (percent): (surface layer)	0.5	4.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	0	8
Sodium Absorption Ratio: (0 - 12 inches)	0	10
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	6.6	8.4
Available Water Capacity (inches): (0 - 60 inches)	5	11
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	12

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

Iliff	Limon	Razor	Weld
Kanorado	Platner	Ryus	
Lebsack	Rago	Spearville	

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>	<u>Note</u>
Creeping foxtail	ALAR	NS	G	
Crested wheatgrass	AGCR	G	NS	
Intermediate wheatgrass	THIN6	G	F	
Meadow brome	BRBI2	NS	G	
Orchardgrass	DAGL	NS	G	
Pubescent wheatgrass	THIN6	G	F	
Reed canarygrass	PSJU3	NS	F	
Russian wildrye	PSJU3	F	NS	
Smooth brome	BRINI2	NS	G	
Tall fescue	LOAR10	NS	F	North of NE/KS border only
Tall wheatgrass	THPO7	F	F	
Western wheatgrass	PASM	G	NS	
 <u>Warm Season Grasses</u>				
Big bluestem	ANGE	F	F	
Indiangrass	SONU2	F	F	
Little bluestem	SCSC	G	NS	
Sideoats grama	BOCU	G	NS	
Switchgrass	PAVIV	F	F	

PASTURE AND HAYLAND INTERPRETATIONS

Page 4

<u>Legumes</u>	<u>Plant Symbol</u>	<u>Dryland</u>	<u>Irrigated</u>	<u>Note</u>
Alfalfa	MESA	G	G	
Birdsfoot trefoil	LOCO6	NS	F	North of NE/KS border only
Cicer milkvetch	ASCI4	F	F	
Red clover	TRPR2	NS	F	North of NE/KS border only

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.

<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)
Alfalfa	1400	10000	3900	18000
Alfalfa/Cool Season Grass	1400	10000	3900	18000
Intermediate wheatgrass	1400	4300		
Little bluestem	900	2900		
Sideoats grama	600	2000		
Smooth brome grass			3900	15400
Western wheatgrass	1400	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: KS0001

Growth Curve Name: Alfalfa

Growth Curve Description: 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	0	30	30	20	15	5	0	0	0

Growth Curve Number: KS0002
Growth Curve Name: Cool-season grass fertilized early
Growth Curve Description: 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	40	30	5	5	10	0	0	0

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

Water Holding Capacity

- Water holding capacity ranges from moderate to high on these soils. Forage production on soils of 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

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