

## FORAGE SUITABILITY GROUP

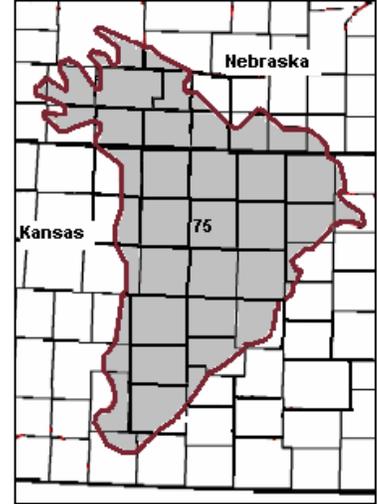
### Clayey

**FSG No.:** G073XY210KS  
**Major Land Resource Area:** 073X -Rolling Plains and Breaks

#### Physiographic Features

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

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	1600	3000
<b>Slope (percent):</b>	0	8
<b>Flooding:</b>		
<b>Frequency:</b>	None	Frequent
<b>Duration:</b>	None	Very Brief
<b>Ponding:</b>		
<b>Depth (inches):</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	Negligible	High



#### Climatic Features

Average annual precipitation for all climate stations listed below in MLRA 73 is about 24 inches. About 75 percent of that precipitation falls during the months of April through September. On average there are about 28 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 12 inches at Ness City, KS, to 28 inches at Culbertson, NE. Snow cover at depths greater than 1 inch range from a low of 5 days per year at Ness City to a high of 38 days at Culbertson.

Average January temperatures are about 26 degree F., and average July temperatures are about 79 degrees. Recorded temperature extremes for the listed climate stations during the years 1961 to 1990 are a low of -35 at Medicine Creek Dam in Nebraska and a high of 114 at Ness City, KS. The MLRA lies in USDA Plant Hardiness Zones 5a, 5b, and 6a.

It is cloudy an average of 124 days a year at Dodge City, KS, and 141 days at North Platte, NE. Average annual wind speeds are about 14 MPH at Dodge City and 10 at North Platte. At Dodge City in June average morning relative humidity is about 80 percent and average afternoon relative humidity is about 52 percent. At North Platte they are 84 percent 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>.

	<b>From</b>	<b>To</b>
<b>Freeze-free period (28 deg)(days):</b> (9 years in 10 at least)	143	196
<b>Last Killing Freeze in Spring (28 deg):</b> (1 year in 10 later than)	May 10	Apr 15
<b>Last Frost in Spring (32 deg):</b> (1 year in 10 later than)	May 21	Apr 29

	<b>From</b>	<b>To</b>
<b>First Frost in Fall (32 deg):</b> (1 year in 10 earlier than)	Sep 13	Oct 07
<b>First Killing Freeze in Fall (28 deg):</b> (1 year in 10 earlier than)	Sep 24	Oct 20
<b>Length of Growing Season (32 deg)(days):</b> (9 years in 10 at least)	122	170
<b>Growing Degree Days (40 deg):</b>	5276	6985
<b>Growing Degree Days (50 deg):</b>	3183	4392
<b>Annual Minimum Temperature:</b>	-20	-5
<b>Mean annual precipitation (inches):</b>	21	28

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

<b>2 years in 10:</b>	<b><u>Jan</u></b>	<b><u>Feb</u></b>	<b><u>Mar</u></b>	<b><u>Apr</u></b>	<b><u>May</u></b>	<b><u>Jun</u></b>	<b><u>Jul</u></b>	<b><u>Aug</u></b>	<b><u>Sep</u></b>	<b><u>Oct</u></b>	<b><u>Nov</u></b>	<b><u>Dec</u></b>
<b>Precip. Less Than</b>	0.11	0.12	0.37	0.99	1.77	1.48	1.58	1.54	0.80	0.50	0.21	0.20
<b>Precip. More Than</b>	0.80	1.27	3.10	3.51	5.56	5.22	5.44	5.14	5.37	3.13	1.81	1.16
<b>Monthly Average:</b>	0.45	0.59	1.78	2.14	3.63	3.59	3.22	2.90	2.49	1.57	0.96	0.60
<b>Temp. Min.</b>	9.9	15.3	23.2	33.9	44.9	55.1	61.2	58.6	48.0	34.1	22.2	13.0
<b>Temp. Max.</b>	41.8	48.0	57.9	69.6	78.4	88.6	94.3	91.9	82.8	72.5	56.1	44.4
<b>Temp. Avg.</b>	25.9	31.1	40.9	52.7	62.5	72.8	78.7	76.1	66.6	54.8	40.5	29.5

<b><u>Climate Station</u></b>	<b><u>Location</u></b>	<b><u>From</u></b>	<b><u>To</u></b>
KS0693	Beliot, KS	1961	1990
KS2164	Dodge City, KS	1961	1990
KS3100	Glen Elder Lake, KS	1961	1990
KS3218	Great Bend, KS	1961	1990
KS3527	Hays, KS	1961	1990
KS4357	Kirwin, KS	1961	1990
KS4857	Lovel Lake, KS	1961	1990
KS4982	Mankato, KS	1961	1990
KS5692	Ness City, KS	1961	1990
KS6374	Phillipsburg, KS	1961	1990
KS6435	Plainville, KS	1961	1990
KS8648	Webster Dam, KS	1961	1990
NE2065	Culbertson, NE	1961	1990
NE3035	Franklin, NE	1961	1990
NE5388	Medicine Creek Dam, NE	1961	1990

**Soil Interpretations**

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

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

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

	<u>Minimum</u>	<u>Maximum</u>
<b>Depth:</b>	60	
<b>Surface Fragments &gt;3" (% Cover):</b>	0	3
<b>Organic Matter (percent):</b> (surface layer)	1.0	4.0
<b>Electrical Conductivity (mmhos/cm):</b> (0 - 24 inches)	0	4
<b>Sodium Absorption Ratio:</b> (0 - 12 inches)	0	0
<b>Soil Reaction (1:1) Water (pH):</b> (0 - 12 inches)	5.1	8.4
<b>Available Water Capacity (inches):</b> (0 - 60 inches)	8	12
<b>Calcium Carbonate Equivalent (percent):</b> (0 - 12 inches)	0	8

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

Crete	Mento	New Cambria
Detroit	Missler	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/>

Note: Birdsfoot trefoil and red clover should only be planted north of the NE/KS border.

<u>Cool Season Grasses</u>	<u>Plant Symbol</u>	<u>Dryland</u>	<u>Irrigated</u>	<u>Note</u>
Canada wildrye	ELCA4	F	NS	
Creeping foxtail	ALAR	NS	G	
Crested wheatgrass	AGCR	F	NS	
Intermediate	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	Irrigated north of NE/KS border only
Tall wheatgrass	THPO7	F	F	
Western wheatgrass	PASM	G	NS	

<u>Warm Season</u>	<u>Plant Symbol</u>	<u>Dryland</u>	<u>Irrigated</u>
Big bluestem	ANGE	F	F
Indiangrass	SONU2	F	F
Little bluestem	SCSC	G	NS
Sideoats grama	BOCU	G	NS
Switchgrass	PAVIV	F	F

<u>Legumes</u>	<u>Plant Symbol</u>	<u>Dryland</u>	<u>Irrigated</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

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:** 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

<b><u>Percent Production by Month</u></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	15	35	30	15	5	0	0	0

**Growth Curve Number:** KS0005  
**Growth Curve Name:** Alfalfa  
**Growth Curve Description:** MLRAs 73, 72 dryland

<b><u>Percent Production by Month</u></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	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

<b><u>Percent Production by Month</u></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	10	40	35	0	5	10	0	0	0

### **Soil Limitations**

#### 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**

#### 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 Kansas and Nebraska counties in MLRA 73  
 Kansas and 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:

KS

NE

**Forage Suitability Group Approval:**

Original Author: Tim Nordquist

Original Date: 6/29/2002

Approval by: David Kraft

Approval Date: