

FORAGE SUITABILITY GROUP

Loamy, coarse

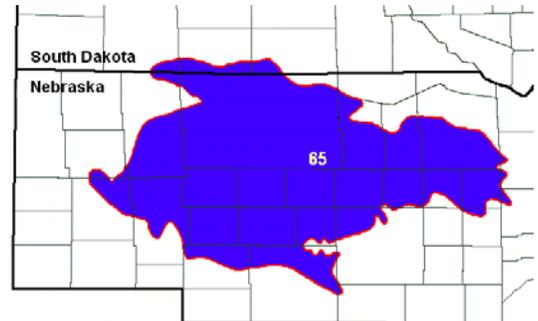
FSG No.: G065XY120NE

Major Land Resource Area: 065X - Nebraska Sand Hills

Physiographic Features

The soils in this group are found on upland slopes, in sandhill valleys, and on stream terraces.

| | <u>Minimum</u> | <u>Maximum</u> |
|--------------------------|----------------|----------------|
| Elevation (feet): | 1970 | 3900 |
| Slope (percent): | 0 | 30 |
| Flooding: | | |
| Frequency: | None | None |
| Duration: | None | None |
| Ponding: | | |
| Depth (inches): | | |
| Frequency: | None | None |
| Duration: | None | None |
| Runoff Class: | Low | High |



Climatic Features

This group occurs in a mid-continental climate characterized by wide seasonal temperature and precipitation fluctuations and extremes.

Annual precipitation varies widely from year to year in MLRA 65. Average annual precipitation for all climate stations listed below is about 21 inches, and ranges from about 17 inches in the west to about 24 inches in the east. About 78 percent of the annual precipitation occurs during the months of April through September. On average there are about 28 days with greater than .1 inches of precipitation during that same time period. 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 23 inches at Burwell, NE to 44 inches at Newport, NE. Days with snow cover at depths greater than 1 inch range from 13 at Ellsworth, NE to 74 at Newport, NE.

Average July temperatures for the listed stations are about 74 degrees F., and average January temperatures are about 22 degrees F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -42 at Ellsworth and a high of 114 recorded at Valentine. The MLRA lies almost wholly in USDA Plant Hardiness Zone 4b.

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) | 133 | 151 |
| Last Killing Freeze in Spring (28 deg): (1 year in 10 later than) | May 17 | May 10 |
| Last Frost in Spring (32 deg): (1 year in 10 later than) | Jun 04 | May 18 |
| First Frost in Fall (32 deg): (1 year in 10 earlier than) | Sep 08 | Sep 21 |

PASTURE AND HAYLAND INTERPRETATIONS

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| | | |
|--|-----------------------|---------------------|
| First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than) | From Sep 15 | To Sep 29 |
| Length of Growing Season (32) (9 years in 10 at least) | 105 | 133 |
| Growing Degree Days (40 deg): | 4584 | 4963 |
| Growing Degree Days (50 deg): | 3038 | 3061 |
| Annual Minimum Temperature: | -25 | -20 |
| Mean annual precipitation (inches): | 17 | 24 |

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 | 0.15 | 0.13 | 0.41 | 0.98 | 1.79 | 1.94 | 1.67 | 1.14 | 0.66 | 0.37 | 0.19 | 0.17 |
| Precip. More Than | 0.65 | 0.83 | 1.88 | 2.92 | 4.71 | 4.63 | 4.43 | 3.48 | 2.97 | 1.68 | 1.22 | 0.78 |
| Monthly Average: | 0.39 | 0.50 | 1.22 | 2.01 | 3.34 | 3.36 | 3.14 | 2.39 | 1.92 | 1.07 | 0.73 | 0.49 |
| Temp. Min. | 9.4 | 14.4 | 22.5 | 33.6 | 44.4 | 54.1 | 60.1 | 57.6 | 47.0 | 35.0 | 22.6 | 12.2 |
| Temp. Max. | 34.4 | 39.7 | 48.4 | 61.5 | 71.8 | 82.0 | 88.4 | 86.3 | 76.4 | 65.2 | 48.5 | 36.9 |
| Temp. Avg. | 21.9 | 27.0 | 35.4 | 47.6 | 58.1 | 68.1 | 74.2 | 72.0 | 61.7 | 50.1 | 35.6 | 24.6 |

| <u>Climate Station</u> | <u>Location</u> | <u>From</u> | <u>To</u> |
|------------------------|-----------------|-------------|-----------|
| NE0050 | Ainsworth | 1960 | 1990 |
| NE0365 | Arthur | 1960 | 1990 |
| NE1130 | Brewster | 1960 | 1990 |
| NE2647 | Ellsworth | 1960 | 1990 |
| NE3540 | Halsey | 1960 | 1990 |
| NE4100 | Hyannis | 1960 | 1990 |
| NE5700 | Mullen | 1960 | 1990 |
| NE5929 | Newport | 1960 | 1990 |
| NE6385 | Oshkosh | 1960 | 1990 |
| NE8650 | Tryon | 1960 | 1990 |
| NE8760 | Valentine | 1960 | 1990 |

Soil Interpretations

This group consists mostly of very deep, moderately well and well drained, moderately coarse textured soils. Permeability is moderately rapid, and available water capacity is moderate to high.

| | | | |
|---|---------------|----|------------------|
| Drainage Class: | None selected | To | None selected |
| Permeability Class: (0 - 40 inches) | Moderate | To | Moderately rapid |
| Frost Action Class: | Moderate | To | Moderate |

| | <u>Minimum</u> | <u>Maximum</u> |
|---|----------------|----------------|
| Depth: | 72 | 0 |
| Surface Fragments >3" (% Cover): | 0 | 0 |
| Organic Matter (percent): (surface layer) | 0.5 | 4.0 |
| Electrical Conductivity (mmhos/cm): (0 - 24 inches) | 0 | 2 |
| Sodium Absorption Ratio: (0 - 12 inches) | 0 | 5 |
| Soil Reaction (1:1) Water (pH): (0 - 12 inches) | 5.1 | 8.4 |

| | | |
|--|---------------------|---------------------|
| Available Water Capacity (inches): (0 - 60 inches) | <u>Minimum</u> 6 | <u>Maximum</u> 9 |
| Calcium Carbonate Equivalent (0 - 12 inches) | 0 | 14 |

Soil Series

| | | |
|----------|--------|-------|
| Anselmo | Hersh | Vetal |
| Doughboy | Jansen | |

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> |
|----------------------------|---------------------|----------------|------------------|
| Crested wheatgrass | AGCR | G | NS |
| Green needlegrass | NAVI4 | G | NS |
| Intermediate wheatgrass | THIN6 | G | G |
| Meadow bromegrass | BRBI2 | F | G |
| Orchardgrass | DAGL | NS | G |
| Pubescent wheatgrass | THIN6 | G | G |
| Russian wildrye | PSJU3 | G | NS |
| Smooth bromegrass | BRINI2 | F | G |
| Western wheatgrass | PASM | G | NS |
| <u>Warm Season Grasses</u> | | | |
| Big bluestem | ANGE | G | G |
| Indiangrass | SONU2 | F | G |
| Little bluestem | SCSC | G | NS |
| Prairie sandreed | CALO | G | NS |
| Sand bluestem | ANHA | G | NS |
| Sand lovegrass | ERTR3 | F | NS |
| Sideoats grama | BOCU | G | NS |
| Switchgrass | PAVIV | F | G |
| <u>Legumes</u> | | | |
| Alfalfa | MESA | G | G |
| Birdsfoot trefoil | LOCO6 | NS | G |
| Cicer milkvetch | ASCI4 | G | F |
| Purple prairieclover | DAPUP | G | NS |
| Red Clover | TRPR2 | NS | G |
| Sainfoin | ONVI | F | NS |
| White prairieclover | DACAC | F | NS |

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.

PASTURE AND HAYLAND INTERPRETATIONS

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 | 2300 | 3700 | | |
| Alf/Intermediate wheatgrass | 1700 | 2900 | 6900 | 11400 |
| Alf/Smooth brome grass | 1700 | 2900 | 6900 | 11400 |
| Crested wheatgrass | 1400 | 2600 | | |
| Intermediate wheatgrass | 1400 | 2600 | 6900 | 11400 |
| Smooth brome grass | 1400 | 2600 | 6900 | 11400 |

Forage Growth Curves

Growth Curve Number: SD0001

Growth Curve Name: Alfalfa

Growth Curve Description: Alfalfa, MLRAs 107, 102B, 63B, 66, 65

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 | 5 | 30 | 25 | 20 | 15 | 5 | 0 | 0 | 0 |

Growth Curve Number: SD0004

Growth Curve Name: Cool season grass

Growth Curve Description: Cool season grass, state wide

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 | 10 | 5 | 5 | 0 | 0 | 0 |

Growth Curve Number: SD0005

Growth Curve Name: Warm season grass

Growth Curve Description: Warm season grass, state wide

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 | 10 | 40 | 35 | 15 | 0 | 0 | 0 | 0 |

Growth Curve Number: SD0003

Growth Curve Name: Irrigated Alfalfa

Growth Curve Description: Irrigated Alfalfa, state wide

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 | 5 | 25 | 25 | 20 | 15 | 10 | 0 | 0 | 0 |

Soil Limitations

Available water capacity

- Moderate available water capacity limits plant growth during periods of moisture deficit.

Water erosion

- A potential problem during establishment, and in thin, open established stands

Livestock trail erosion

- A potential problem in established stands.

Wind erosion

- A potential problem during stand establishment on moderately coarse textured soils, and in heavy use areas.

Management Interpretations

Available water capacity

- When establishing new stands select forage species that are tolerant to periods of drought and inadequate soil moisture.

Wind and water erosion

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

Livestock trail erosion

- Locate fences, lanes, water developments, and mineral areas to reduce livestock trailing perpendicular to steeper slopes.

FSG Documentation

Similar FSGs:

FSG ID

G065XY100NE

FSG Narrative

Loamy soils have greater available water capacity and greater production potential.

G065XY300NE

Sands soils typically have coarser textures and lower available water holding capacity.

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) for soil surveys in South Dakota and Nebraska counties in MLRA 65

South Dakota and Nebraska NRCS Field Office Technical Guides

NRCS National Range and Pasture Handbook

Various South Dakota and Nebraska 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

SD

Forage Suitability Group Approval:

Original Author: Tim Nordquist

Original Date: 4/1/2003

Approval by: Dana Larsen

Approval Date: