

## FORAGE SUITABILITY GROUP

### Loamy and Clayey Soils on Knolls and Ridges of Mesic Uplands

**FSG No.: G138XA311FL**

**Major Land Resource Area (MLRA 138):** North  
Central Florida Ridge

#### Map Unit List

Orangeburg loamy fine sand, 2 to 5 percent slopes

#### Adapted Species List

The native forage species listed are considered adapted to grow on the soils in this group at their natural pH levels. All introduced grass and legume species will need native pH raised to min. 5.5 (unless noted) for best production. All forages listed are adapted to dryland conditions. Consult with state extension service for current cultivar recommendations (<http://agronomy.ifas.ufl.edu/foragesofflorida/>).

#### Perennial Species:

##### Grasses

Warm season (Introduced)

- Bahiagrass (*Paspalum notatum*, pH 5.0 – 6.5)
- Bermudagrass (*Cynodon dactylon*)

Warm season (Native)

- Big Bluestem (*Andropogon gerardii*)
- Chalky Bluestem (*Andropogon virginicus* var. *glaucus*)
- Splitbeard Bluestem (*Andropogon ternarius*)
- Yellow Indiangrass (*Sorghastrum nutans*,)
- Lopsided Indiangrass (*Sorghastrum secundum*)
- Switchgrass (*Panicum virgatum*)
- Eastern Gamagrass (*Tripsacum dactyloides*)

##### Legumes

Warm season

- Rhizoma Perennial Peanut (*Arachis glabrata*, pH 5.8-7.0)

#### Annual Species:

##### Grasses

Warm season

- Browntop Millet (*Urochloa ramosa*; =*Panicum ramosum*)
- Pearl Millet (*Pennisetum glaucum*)
- Sorghum (*Sorghum bicolor*; includes forage sorghum, sudangrass, and their hybrids)

##### Cool season

- Ryegrass, annual (*Lolium perenne* ssp. *multiflorum*; =*L. multiflorum*)
- Oat (*Avena sativa*)
- Rye (*Secale cereale*)
- Wheat (*Triticum aestivum*)
- Triticale (x *Triticosecale*)

##### Legumes

Warm season

- Hairy Indigo (*Indigofera hirsuta*)
- Alyceclover (*Alysicarpus vaginalis*)
- Cowpea (*Vigna unguiculata*)

Cool season

- White Clover (*Trifolium repens*, pH 6.0-7.5)
- Red Clover (*Trifolium pratense*, pH 6.0 – 8.0)
- Crimson Clover (*Trifolium incarnatum*)
- Arrowleaf Clover (*Trifolium vesiculosum*)
- Austrian Winter Pea (*Pisum sativum*, pH 6.0-7.5)
- Hairy Vetch (*Vicia villosa*)
- Medics (*Medicago* spp., pH 5.5-8.0)
- Alfalfa (*Medicago sativa*, pH 6.5-7.5)

#### Seasonal and Total Production Estimates

Warm season grass production should be similar to FSG G138XA321 during times of normal summer rainfall, but dry periods will effect plant growth more quickly due to greater depth to permanent water table. This will be particularly noticeable in the spring.

For this FSG, cool season forages such as annual ryegrass, oats, and wheat planted should be practical most years although lower water holding capacity means that production will more often be at the lower end FSG G138XA321. Overseeding annual ryegrass on a bahiagrass pasture also is recommended for this forage suitability group although planting may be delayed due to dry soil conditions in the fall.

Due to the clay and loam content of the soils in this FSG, cool season legumes should be relatively productive. White clover, red clover, and crimson clover planted in a prepared seedbed, should be considered on this FSG. Grazing management and fertilization need to favor the legume component for persistence, productivity, and seed production when natural reseeding of annual

species is desired. Grazing management for seed production also is important for white clover and red clover, which are normally considered a perennial species, function more as an annual in Florida and thus are heavily dependent upon reseeding to persist. Due to bloat issue, clovers should be used only in mixtures with cool season grasses, overseeded on bahiagrass pastures, or when a bloat preventative supplement is fed.

Initial growth of perennial warm season grasses and legumes or establishment of warm season annual grasses

may be delayed in the spring due to low rainfall. Once normal summer rainfall begins, plant production should resume. Warm season legumes such as hairy indigo or alyceclover can be planted in a prepared seedbed. They also can be oversown onto warm season grasses in this forage suitability group, although fertilization (no N fertilizer) and grazing management needs to favor legume establishment and persistence. Additional lime may be needed to maintain a pH of 5.5 to 6.0

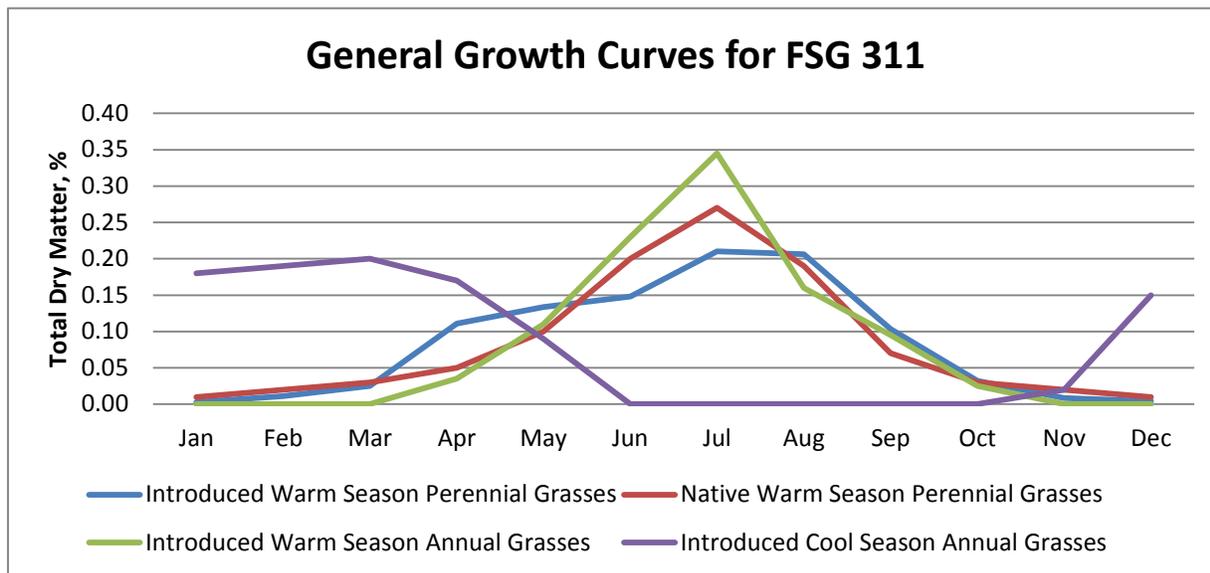
| <b>Expected Range in Dry Matter Production and Animal Unit Months (AUM) for Different Forages†</b> |                                      |        |                           |     |
|--|--------------------------------------|--------|---------------------------|-----|
| <b>Forage</b>  | <b>Range in Dry Matter, lbs/acre</b> |        | <b>Range in AUM/acre‡</b> |     |
| Bahiagrass, Argentine (100-200 lb N/A) <sup>5,6,7#</sup>   | 4,400                                | 10,900 | 2.8                       | 7.0 |
| Bahiagrass, Pensacola (100-200 lb N/A) <sup>5,6,7</sup>  | 4,100                                | 10,150 | 2.6                       | 6.5 |
| Bahiagrass, Tifton 9 (100-200 lb N/A) <sup>5,6,7</sup>   | 6,800                                | 11,500 | 4.4                       | 7.4 |
| Bermudagrass, Tifton 85 (100-200 lb N/A) <sup>5,6,7</sup>  | 6,270                                | 11,700 | 4.0                       | 7.5 |
| Bermudagrass, Florakirk (100-200 lb N) <sup>2,5,6,7</sup>  | 6,570                                | 11,300 | 4.2                       | 7.2 |
| Bermudagrass, Coastal (100-200 lb N/A) <sup>5,6,7,10</sup>   | 3,600                                | 10,800 | 2.3                       | 6.9 |
| Eastern Gamagrass, Pete (100-300 lb N/A) <sup>5,6,7</sup>  | 4,000                                | 6,750  | 2.6                       | 4.3 |
| Big Bluestem (100-300 lb N/acre) <sup>5,6,7</sup>  | 870                                  | 1,800  | 0.6                       | 1.2 |
| Ryegrass (120 lb N/A) <sup>3,4</sup>   | 3,530                                | 7,200  | 2.3                       | 4.6 |
| Small Grain Forage (oat, wheat, etc.; 120 lb N/acre) <sup>1</sup>                                  | 6,000                                | 7,200  | 3.8                       | 4.6 |
| Pearl Millet (200 lb N/acre) <sup>5,6,7</sup>  | 8,000                                | 10,000 | 5.1                       | 6.4 |
| Sorghum - Sudangrass (200 lb N/acre) <sup>5,6,7</sup>  | 10,000                               | 11,700 | 6.4                       | 7.5 |
| Rhizoma Perennial Peanut <sup>2</sup>  | 3,500                                | 5,650  | 2.2                       | 3.6 |
| Alfalfa <sup>8,9</sup>   | 9,000                                | 11,700 | 5.8                       | 7.5 |
| Cool-Season Clovers, overseeded on bahiagrass <sup>4,6,7</sup>                                     | 300                                  | 1,100  | 0.2                       | 0.7 |
| Cool-Season Clovers, prepared seedbed <sup>4,6</sup>   | 1,330                                | 3,600  | 0.9                       | 2.3 |
| Alyceclover <sup>4</sup>   | 1,500                                | 3,150  | 1.0                       | 2.0 |
| Hairy Indigo <sup>4</sup>  | 2,000                                | 5,400  | 1.3                       | 3.5 |

†Production data based on 10% reduction in upper yield range of FSG G138XA321FL.

‡Animal Unit Month based on 50% grazing efficiency and 2.6% intake per day.

#Superscript numbers refer to references.

**Production Curves:**



| Dry Matter Production Distribution by Month     |      |      |      |      |      |      |      |      |      |      |      |      |
|---|------|------|------|------|------|------|------|------|------|------|------|------|
| Forage  | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  |
| <b>Introduced Warm Season Perennial Grasses</b> |      |      |      |      |      |      |      |      |      |      |      |      |
| Bahiagrass (Pensacola)                          |      | 0.01 | 0.03 | 0.14 | 0.14 | 0.17 | 0.19 | 0.17 | 0.14 | 0.03 |      |      |
| Bahiagrass (Argentine)                          |      | 0.01 | 0.04 | 0.08 | 0.09 | 0.18 | 0.25 | 0.22 | 0.11 | 0.02 |      |      |
| Bermudagrass (Tifton 85)                        |      | 0.02 | 0.02 | 0.13 | 0.15 | 0.13 | 0.21 | 0.22 | 0.08 | 0.03 | 0.01 | 0.00 |
| Bermudagrass (Coastal)                          | 0.01 | 0.01 | 0.02 | 0.13 | 0.14 | 0.13 | 0.21 | 0.22 | 0.09 | 0.02 | 0.01 | 0.01 |
| <b>Native Warm Season Perennial Grasses</b>     |      |      |      |      |      |      |      |      |      |      |      |      |
| Native Warm Season Grasses (Generic)            | 0.01 | 0.02 | 0.03 | 0.05 | 0.1  | 0.2  | 0.27 | 0.19 | 0.07 | 0.03 | 0.02 | 0.01 |
| Eastern Gamagrass                               | 0.01 | 0.02 | 0.04 | 0.16 | 0.18 | 0.2  | 0.16 | 0.13 | 0.06 | 0.02 | 0.01 | 0.01 |
| Switchgrass                                     | 0.01 | 0.02 | 0.03 | 0.07 | 0.15 | 0.19 | 0.2  | 0.19 | 0.09 | 0.03 | 0.01 | 0.01 |
| <b>Legumes or Legume/Grass Combinations</b>     |      |      |      |      |      |      |      |      |      |      |      |      |
| Rhizoma Perennial Peanut                        |      |      | 0.05 | 0.15 | 0.14 | 0.15 | 0.20 | 0.18 | 0.14 |      |      |      |
| White Clover/Argentine Bahiagrass               | 0.01 | 0.02 | 0.07 | 0.14 | 0.17 | 0.21 | 0.18 | 0.12 | 0.09 | 0.02 |      |      |
| <b>Cool Season Annual Grasses</b>               |      |      |      |      |      |      |      |      |      |      |      |      |
| Annual Ryegrass                                 | 0.18 | 0.18 | 0.2  | 0.18 | 0.1  |      |      |      |      |      | 0.02 | 0.14 |
| Small Grains (Wheat, Rye, etc.)                 | 0.18 | 0.2  | 0.2  | 0.16 | 0.08 |      |      |      |      |      | 0.02 | 0.16 |
| <b>Warm Season Annual Grasses</b>               |      |      |      |      |      |      |      |      |      |      |      |      |
| Sorghum-Sudangrass                              |      |      |      |      | 0.07 | 0.2  | 0.3  | 0.25 | 0.15 | 0.03 |      |      |
| Millet (Pearl and Browntop)                     |      |      |      | 0.07 | 0.15 | 0.26 | 0.39 | 0.07 | 0.04 | 0.02 |      |      |

## Physiographic Features

Dominantly very deep, nearly level or gently sloping, well drained soils formed in loamy and/or clayey marine deposits. These soils occur on summits, shoulders, and back slopes of marine terraces. Diagnostic subsurface horizon is an argillic horizon above 20 inches. The organic matter content of the surface layer is dominantly very low to medium. Unless limed, the reaction in the surface layer ranges from extremely acid to slightly acid.

## Climatic Features

**Freeze-free period (>28° F 9 years in 10 at least):**  
 averages 270 d (range 266-278 d)

**Length of growing season (>32° F 9 years in 10 at least):** averages 234 d (range 225-247 d)

**Annual minimum temperature (° F in month of January):**  
 averages 41.1 (range 38.6-43.5)

**USDA Plant Hardiness Zone:**  
 8b (15-20° F, Jacksonville)  
 8a (10-15° F, Glen St. Mary)

**Mean annual precipitation (inches):**  
 averages 54.40 (range 52.24-59.65)

## Soil Properties

**Percent Slope:** 0 to 5 percent

**Surface Texture:** Dominantly loamy sand, loamy fine sand, sandy loam or fine sandy loam. A few members are loam, sandy clay, clay, sand, or fine sand.

**Sand Content of Surface Layer:** 32 to 95 percent

**Clay Content of Surface Layer:** 4 to 42 percent

**Organic Matter Content of Surface Layer:** 0.5 to 4 percent

**Cation Exchange Capacity of Surface Layer (meq/100g):**  
 1.2 to 13.6

**Effective Cation Exchange Capacity of Surface Layer (meq/100g):** 0.3 to 7.8

**Bulk Density of Surface Layer (g/cc):** 1.35 to 1.68

**Saturated Hydraulic Conductivity of Surface Layer:**  
 Moderate to rapid

**Soil Reaction of Surface Layer:** 3.5 to 6.5 (unless limed)

**Available Water Capacity (0 to 30 inches):** 0.3 to 1.1 inch per inch

**Depth to Finer Textured Material:** Less than 20 inches

**Depth to Bedrock:** Greater than 80 inches. A few members have bedrock between 40 and 80 inches.

**Drainage Class (Agronomic):** Well

**Depth to Seasonal High Water Table (during wet periods):** Greater than 6 feet

**Flooding:** None

**Ponding:** None

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

|                   | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  |
|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>Precip avg</b> | 4.89 | 3.82 | 5.09 | 3.28 | 3.27 | 6.23 | 6.84 | 7.12 | 4.86 | 2.98 | 2.69 | 3.34 |
| <b>Avg Min</b>    | 41.1 | 43.6 | 49.4 | 54.3 | 62.0 | 68.5 | 71.1 | 70.8 | 67.9 | 57.7 | 50.0 | 43.2 |
| <b>Avg Temp</b>   | 55.1 | 56.3 | 62.3 | 67.5 | 74.4 | 79.6 | 81.6 | 81.2 | 78.4 | 69.8 | 62.4 | 55.4 |
| <b>Avg Max</b>    | 65.7 | 68.9 | 75.2 | 80.5 | 86.8 | 90.7 | 92.0 | 91.5 | 88.9 | 82.1 | 74.7 | 67.6 |

## Climate Station Locations (averages from 1971 to 2000; see Appendix 1)

## FSG Documentation

### Inventory Data References:

1. Barnett, R.D., D.L. Wright, A.R. Soffes Blount, and R.L. Stanley. 1997. Small Grain Production Recommendations for the 1997-98 Growing Season. Univ. Florida, IFAS, Florida Coop. Ext. Ser. SS-AGR-46.
2. Dunavin, LS. 1996. Fertility Trials with Florakirk Bermudagrass and Chicory and Harvest Date Trial with Florigraze Rhizoma Peanut. Univ. Florida, IFAS, Agric. Exp. Stn., WFREC Res. Rep. WF96-4.
3. ----- . 1997. Cool-Season Forage Trials, 1996-1997. Univ. Florida, IFAS, Florida Agric. Exp. Stn., WFREC Res. Rep. WF97-5.
4. -----, and C.G. Chambliss. 2000. Cool-Season Forage Variety Trials, WFREC, Jay, FL 1999-2000. Univ. Florida, IFAS, Florida Exp. Stn. SS-AGR-85.
5. -----, and D.W. Gorbet. 2000. Variety and Other Trials of Several Forage Grasses and Legumes, Temperate Corn and Grain Sorghum. Univ. Florida, IFAS, Florida Agric. Exp. Stn., WFREC Res. Rep. WF 00-03.
6. ----- . 2001. Variety and Other Trials of Several Forage Grasses and Legumes, Temperate Corn and Grain Sorghum. Univ. Florida, IFAS, Agric. Exp. Stn., WFREC Res. Rep. WFREC Res. Rep. WF01-03.
7. ----- . 2002. Variety and Other Trials of Several Forage Grasses and Legumes and Grain Sorghum. Univ. Florida, IFAS, Florida Agric. Exp. Stn., WFREC Res. Rep. WF02-03.
8. -----, H.A. Peacock, and D.W. Gorbet. 1991. Variety Trials of Warm-Season Perennial Grasses, Grain Sorghum, Millet and Sorghum X Sudangrass Hybrids, and Alfalfa, 1990. Univ. Florida, IFAS, Florida Agric. Exp. Stn., Jay, AREC Res. Rep. WF91-2.
9. ----- . 1993. Variety Trials of Warm-Season Perennial Grasses, Grain Sorghum, Summer Annual Grasses, Alfalfa, and Summer Legumes. Univ. Florida, IFAS, Florida Agric. Exp. Stn., Jay AREC Res. Rep. Jay, AREC Res. Rep. WF93-2.
10. Rhoads, F.M., and R.L. Stanley, Jr. 1989. Coastal Bermudagrass Yield, Soil-pH, and Ammonium Sulfate-Nitrate Rates. Univ. Florida, IFAS, Florida Agric. Exp. Stn., NFREC-Quincy Res. Rep. 89-9.

**State Correlation: (NA)**

### Forage Suitability Group Approval:



Greg Hendricks, State Resource Conservationist



Tom Weber, State Soil Scientist

| <b>Appendix 1: Climate Station Locations</b> |                 |               |
|--|-----------------|---------------|
| <b>COOP ID (FL=08)</b>                       | <b>Location</b> | <b>County</b> |
| 4731   | Lake City       | Columbia      |
| 4394   | Jasper          | Hamilton      |
| 5539   | Mayo            | LaFayette     |
| 9120   | Usher Tower     | Levy          |
| 5275   | Madison         | Madison       |
| 5099   | Live Oak        | Suwannee      |