

## FORAGE SUITABILITY GROUP

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

**FSG No.:** G154XB322FL

**Major Land Resource Area (MLRA 154):** South-Central Florida Ridge

#### Map Unit List

- Micanopy fine sand, 5 to 8 percent slopes
- Norfolk loamy fine sand, 5 to 8 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. Irrigation is not recommended in these soils, and 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*, northern half of MLRA)
- Chalky Bluestem (*Andropogon virginicus* var. *glaucus*)
- Splitbeard Bluestem (*Andropogon ternarius*)
- Yellow Indiangrass (*Sorghastrum nutans*, northern half of MLRA)
- Lopsided Indiangrass (*Sorghastrum secundum*)
- Switchgrass (*Panicum virgatum*)
- Eastern Gamagrass (*Tripsacum dactyloides*)

##### Legumes

###### Warm season

- Rhizoma Perennial Peanut (*Arachis glabrata*, pH 5.8-7.0))
- Carpon desmodium (*Desmodium heterocarpon*)

#### Annual Species:

##### Grasses

###### Warm season

- Browntop Millet (*Urochloa ramosa*; =*Panicum ramosum*)
- Pearl Millet (*Pennisetum glaucum*)
- Forage Sorghum (*Sorghum bicolor*)
- 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*)
- Alfalfa (*Medicago sativa*, pH 6.5-7.5)

## Seasonal and Total Production Estimates

Warm season grass production should be similar to FSG G154XB321FL during times of normal summer rainfall, but dry periods will effect plant growth more quickly due to increased runoff and less infiltration associated with steeper slope. This will be particularly noticeable in the spring, especially so in the southern half of the MLRA where temperatures should not be limiting to warm season grass growth.

Cool season annual grasses should practical most years for all classes of livestock throughout the MLRA. Due to erosion concerns, cool season annual forages such as rye, oats, and wheat should only be used when no-till is an option. Overseeding annual ryegrass on a bahiagrass pasture is recommended for this forage suitability group, particularly in the northern portion of the MLRA.

For similar reasons, cool season legumes should be more productive, particularly in the northern portion of the MLRA. As with the annual cool season grasses, white clover, red clover, and crimson clover planted no-till or overseeded, should be considered on

this FSG, particularly in the northern half of the MLRA. 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.

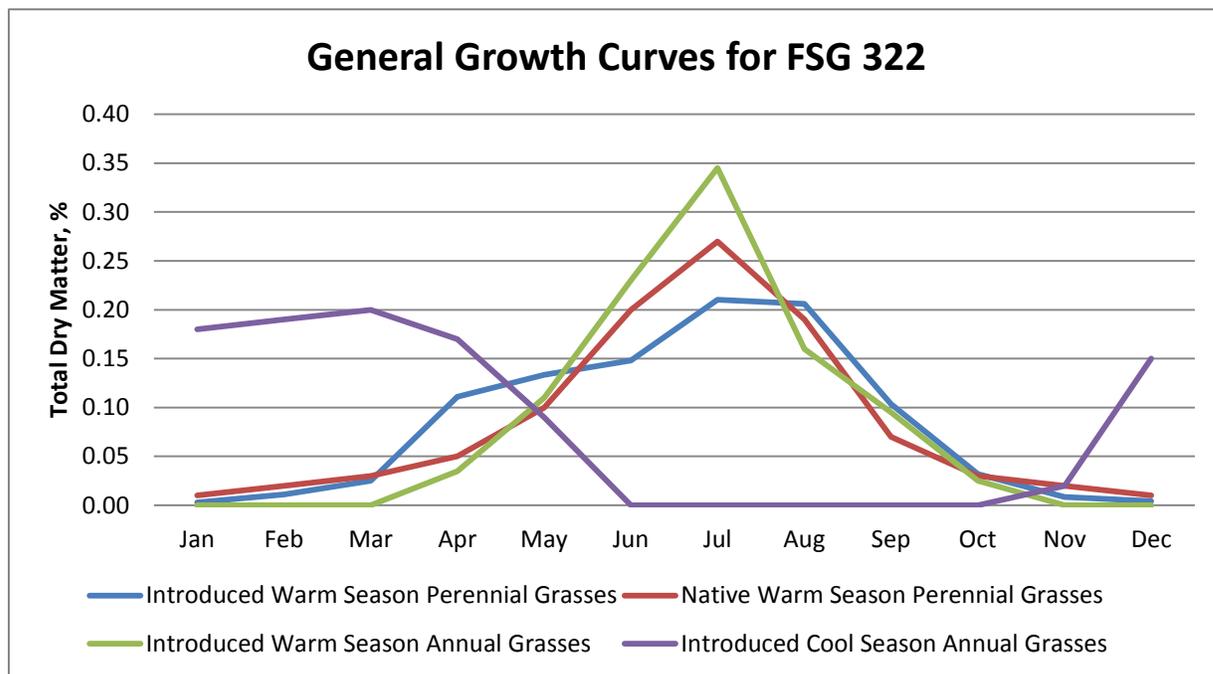
Initial growth of perennial warm season grasses and legumes or establishment of warm season annual grasses may be delayed in the spring due to low rainfall. Once normal summer rainfall begins, plant production should resume. Warm season legumes such as hairy indigo or alyceclover can be planted no-till. They also can be over-sown 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.

| Expected Range in Dry Matter Production and Animal Unit Months (AUM) for Different Forages† |                               |        |                    |     |
|---|-------------------------------|--------|--------------------|-----|
| Forage  | Range in Dry matter, lbs/acre |        | Range in AUM/acre‡ |     |
| Bahiagrass, Argentine (100-200 lb N/A) <sup>5,6,7</sup> #                                   | 3,900                         | 10,900 | 2.5                | 7.0 |
| Bahiagrass, Pensacola (100-200 lb /A) <sup>5,6,7</sup>                                      | 3,700                         | 10,150 | 2.4                | 6.5 |
| Bahiagrass, Tifton 9 (100-200 lb N/A) <sup>5,6,7</sup>                                      | 6,100                         | 11,500 | 3.9                | 7.4 |
| Bermudagrass, Tifton 85 (100-200 lb N/A) <sup>5,6,7</sup>                                   | 5,600                         | 11,700 | 3.6                | 7.5 |
| Bermudagrass, Florakirk (100-200 lb N) <sup>2,5,6,7</sup>                                   | 5,900                         | 11,300 | 3.8                | 7.2 |
| Bermudagrass, Coastal (100-200 lb N/A) <sup>5,6,7,10</sup>                                  | 3,200                         | 10,800 | 2.1                | 6.9 |
| Eastern Gamagrass, Pete (100-300 lb N/A) <sup>5,6,7</sup>                                   | 3,600                         | 6,750  | 2.3                | 4.3 |
| Big Bluestem (100-300 lb N/acre) <sup>5,6,7</sup>   | 800                           | 1,800  | 0.5                | 1.2 |
| Ryegrass (120 lb N/A) <sup>3,4</sup>  | 3,200                         | 7,200  | 2.0                | 4.6 |
| Small Grain Forage (oat, wheat, etc.; 120 lb N/acre) <sup>1</sup>                           | 5,400                         | 7,200  | 3.5                | 4.6 |
| Pearl Millet (200 lb N/acre) <sup>5,6,7</sup>   | 7,200                         | 10,000 | 4.6                | 6.4 |
| Sorghum - Sudangrass (200 lb N/acre) <sup>5,6,7</sup>                                       | 9,000                         | 11,700 | 5.8                | 7.5 |
| Rhizoma Perennial Peanut <sup>2</sup>   | 3,150                         | 5,700  | 2.0                | 3.6 |
| Alfalfa <sup>8,9</sup>  | 8,100                         | 11,700 | 5.2                | 7.5 |
| Cool-Season Clovers, overseeded on bahiagrass <sup>4,6,7</sup>                              | 250                           | 1,100  | 0.2                | 0.7 |
| Cool-Season Clovers, prepared seedbed <sup>4,6</sup>  | 1,200                         | 3,600  | 0.8                | 2.3 |
| Alyceclover <sup>4</sup>  | 1,350                         | 3,150  | 0.9                | 2.0 |
| Hairy Indigo <sup>4</sup>   | 1,800                         | 5,400  | 1.2                | 3.5 |

†Production data based on 10% decrease from FSG G154XB321FL due to slope.

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

#Superscript numbers refer to references.



| <b>Dry Matter Production Distribution by Month</b> |            |            |            |            |            |            |            |            |            |            |            |            |
|--|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| <b>Forage</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>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       |            |            |            |
| Carpon Desmodium/Bahiagrass                        |            | 0.01       | 0.03       | 0.14       | 0.16       | 0.15       | 0.15       | 0.13       | 0.10       | 0.06       | 0.03       | 0.03       |
| 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, sloping to very steep, moderately well drained or well drained soils formed in loamy and/or clayey marine deposits. These soils occur on 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 low or very low. 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 316 d (range 278-365 d)

**Length of growing season (>32° F 9 years in 10 at least):** averages 285 d (range 243-365 d)

**Annual minimum temperature (° F in month of January):**  
 average 50.2 (range 45.2-59.2)

**USDA Plant Hardiness Zone:**  
 9a (20-25° F, Ocala)  
 9b (25-30° F, Orlando)

**Mean annual precipitation (inches):**  
 averages 51.09 (range 47.70-67.03)

## Soil Properties

**Percent Slope:** 5 to 12 percent, but ranges to 60 percent

**Surface Texture:** Loamy sand, loamy fine sand, sandy loam, fine sandy loam, or their gravelly analogs. A few members are clay loam or fine sand.

**Sand Content of Surface Layer:** 37 to 95 percent

**Clay Content of Surface Layer:** 2 to 33 percent

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

**Cation Exchange Capacity of Surface Layer (meq/100g):**  
 0.3 to 5.9

**Effective Cation Exchange Capacity of Surface Layer (meq/100g):** 0.3 to 5.7

**Bulk Density of Surface Layer (g/cc):** 1.2 to 1.65

**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 1.7 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 60 and 80 inches.

**Drainage Class (Agronomic):** Moderately well, Well

**Depth to Seasonal High Water Table (during wet periods):** 3 to 5 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> | 3.04 | 2.89 | 3.69 | 2.40 | 3.52 | 6.86 | 7.17 | 7.36 | 6.22 | 2.79 | 2.38 | 2.47 |
| <b>Avg Min</b>    | 48.1 | 49.6 | 54.4 | 58.5 | 65.0 | 70.7 | 72.3 | 72.5 | 71.0 | 61.0 | 56.6 | 51.0 |
| <b>Avg Temp</b>   | 60.0 | 61.5 | 66.4 | 68.6 | 76.6 | 80.8 | 81.8 | 81.8 | 80.4 | 74.2 | 67.5 | 61.5 |
| <b>Avg Max</b>    | 70.8 | 72.9 | 77.9 | 82.4 | 87.7 | 90.6 | 91.7 | 91.4 | 89.5 | 84.0 | 77.9 | 72.2 |

## 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. Gainesville, FL, USA: University of Florida, Institute of Food and Agricultural Sciences, Florida Cooperative Extension Service, SS-AGR-46.
2. Dunavin, L.S. 1996. Fertility trials with Florakirk bermudagrass and chicory and harvest date trial with Florigraze rhizoma peanut. Gainesville, FL, USA: University of Florida, Institute of Food and Agricultural Sciences, Agriculture Experiment Station, West Florida Research and Education Center Research Report, WF96-4.
3. ----- . 1997. Cool-season forage trials, 1996-1997. Gainesville, FL, USA: University of Florida, Institute of Food and Agricultural Sciences, Agriculture Experiment Station, West Florida Research and Education Center Research Report, WF97-5.
4. -----, and C.G. Chambliss. 2000. Cool-season forage variety trials, WFREC, Jay, FL 1999-2000. Gainesville, FL, USA: University of Florida, Institute of Food and Agricultural Sciences, Agriculture Experiment Station, SS-AGR-85.
5. -----, and D.W. Gorbet. 2000. Variety and Other Trials of several forage grasses and legumes, temperate corn and grain sorghum. Gainesville, FL, USA: University of Florida, Institute of Food and Agricultural Sciences, Agriculture Experiment Station, West Florida Research and Education Center Research Report, WF00-03.
6. ----- . 2001. Variety and other trials of several forage grasses and legumes, temperate corn and grain sorghum. Gainesville, FL, USA: University of Florida, Institute of Food and Agricultural Sciences, Agriculture Experiment Station, West Florida Research and Education Center Research Report, WF01-03.
7. ----- . 2002. Variety and other trials of several forage grasses and legumes and grain sorghum. Gainesville, FL, USA: University of Florida, Institute of Food and Agricultural Sciences, Agriculture Experiment Station, West Florida Research and Education Center Research Report, 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. Gainesville, FL, USA: University of Florida, Institute of Food and Agricultural Sciences, Agriculture Experiment Station, Jay, Agricultural Research and Education Center Research Report, WF91-2.
9. ----- . 1993. Variety trials of warm-season perennial grasses, grain sorghum, summer annual grasses, alfalfa, and summer legumes. Gainesville, FL, USA: University of Florida, Institute of Food and Agricultural Sciences, Agriculture Experiment Station, Jay, Agricultural Research and Education Center Research Report, WF93-2.
10. Rhoads, F.M., and R.L. Stanley, Jr. 1989. Coastal bermudagrass yield, soil-pH, and ammonium sulfate-nitrate rates. Gainesville, FL, USA: University of Florida, Institute of Food and Agricultural Sciences, Agriculture Experiment Station, North Florida Research and Education Center-Quincy Research Report 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> |
| 945  | Bradenton           | Manatee       |
| 6414   | Ocala               | Marion        |
| 6628   | Orlando Intl. Air.  | Orange        |
| 7851   | St. Leo             | Pasco         |
| 7886   | St. Petersburg      | Pinellas      |
| 8824   | Tarpon Springs      | Pinellas      |
| 478  | Bartow              | Polk          |
| 4707   | Lake Alfred Exp Stn | Polk          |
| 4797   | Lakeland            | Polk          |
| 5973   | Mountain Lake       | Polk          |
| 9707   | Winter Haven        | Polk          |
| 1978   | Crescent City       | Putnam        |
| 2915   | Federal Point       | Putnam        |
| 6753   | Palatka             | Putnam        |
| 7982   | Sanford Orlando     | Seminole      |
| 1163   | Bushnell            | Sumter        |
| 2229   | Deland              | Volusia       |