

FORAGE SUITABILITY GROUP

Sandy Over Loamy Soils on Knolls and Ridges of Mesic Uplands

FSG No.: G138XA211FL

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

Map Unit List

- Kenansville loamy sand, 0 to 5 percent slopes
- Lowndes sand, 0 to 5 percent slopes
- Lowndes sand, 5 to 8 percent slopes
- Lucy loamy fine sand, 2 to 5 percent slopes
- Lucy 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. All forages listed are adapted to dryland conditions. Consult with state extension service for current cultivar or germplasm 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)

- Chalky Bluestem (*Andropogon virginicus* var. *glaucus*)
- Splitbeard Bluestem (*Andropogon ternarius*)
- Yellow Indiangrass (*Sorghastrum nutans*)
- Switchgrass (*Panicum virgatum*)

Legumes

Warm season (Introduced)

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

Annual Species:

Grasses

Warm season (Introduced)

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

Cool season

- Oat (*Avena sativa*)
- Rye (*Secale cereale*)
- Wheat (*Triticum aestivum*)
- Triticale (x *Triticosecale*)

Legumes

Warm season (Introduced)

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

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)

Seasonal and Total Production Estimates

Seasonal and total forage production is better for this FSG compared to G138XA111FL. Although depth to seasonal water table is in excess of 6 feet for the soils in this FSG, loamy sands occur at a depth of 20 to 40 inches below the surface. This makes the water holding capacity of the soils in this FSG somewhat higher than those in G138XA111FL, but lower than G138XA311FL. This will mitigate drought effects somewhat, but total annual production is still driven largely by rainfall. However reduced production can occur in years with below average rainfall. Irrigation is not recommended for these soils due to poor water holding capacity. Establishment of both annual and perennial warm season forages maybe delayed due to limited rainfall in the spring although short term drought periods in the summer months should be less severe than for G138XA111FL. Growth curves for warm season perennial forages will still be weighted more towards the later part of the growing season.

Due to more regular winter rainfall, dryland cool season forage production is recommended for this FSG in this MLRA although production will be less than G138XA311FL. Productivity of cool season annuals under dryland conditions will most commonly be at the lower range listed due to poor water holding capacity of the

soils in this FSG. If irrigation is available, production will more consistently fall at the upper end of the range listed.

When legumes are planted, grazing management and fertilization need to favor the legume component for persistence, productivity, and seed production when natural reseeding of annual species is desired. White clover and red clover are short term perennial species in Florida, but function more like annuals. Other species, like crimson clover, may reseed well if they are managed properly. 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.

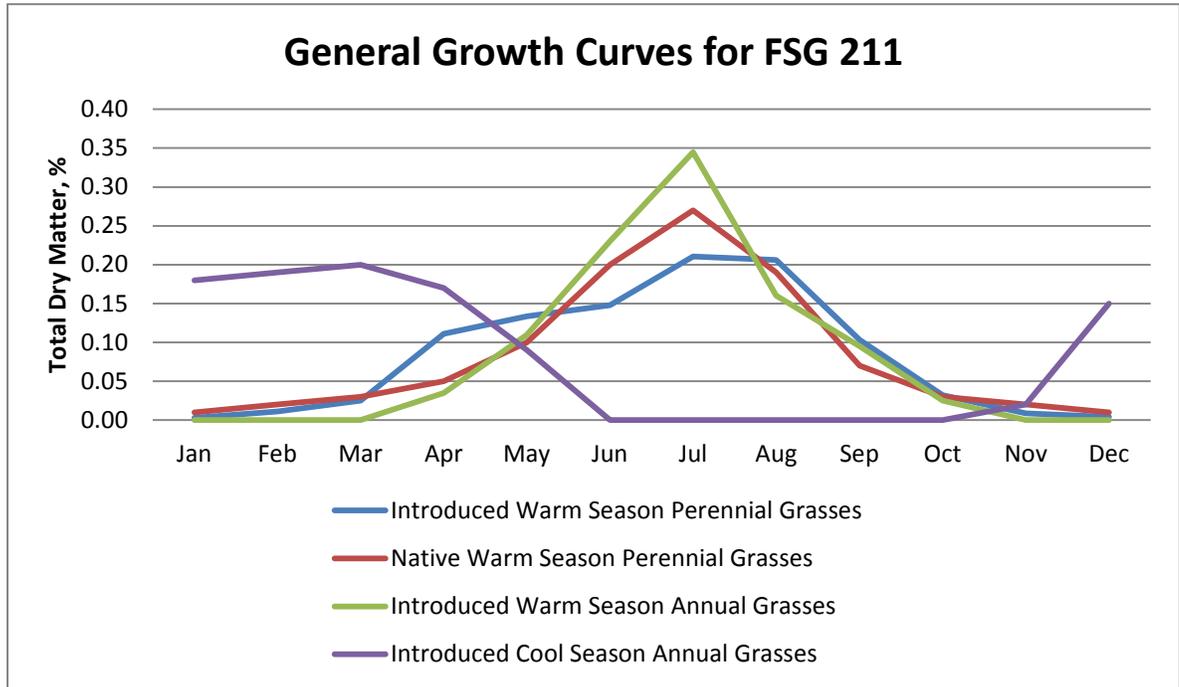
Expected Range in Dry Matter Production and Animal Unit Months (AUM) for Different Forages†				
Forage	Range in Dry Matter, lbs/acre		Range in AUM/acre‡	
Bahiagrass, Argentine (100-200 lb N/A) ^{4,5,6#}	3,300	8,200	2.1	5.2
Bahiagrass, Pensacola (100-200 lb N/A) ^{4,5,6}	3,075	7,600	2.0	4.9
Bahiagrass, Tifton 9 (100-200 lb N/A) ^{4,5,6}	5,100	8,600	3.3	5.5
Bermudagrass, Tifton 85 (100-200 lb N/A) ^{4,5,6}	4,700	8,800	3.0	5.6
Bermudagrass, Florakirk (100-200 lb N) ^{2,4,5,6}	4,900	8,460	3.2	5.4
Bermudagrass, Coastal (100-200 lb N/A) ^{4,5,6,7}	2,700	8,100	1.7	5.2
Big Bluestem (100-300 lb N/acre) ^{4,5,6}	650	1,350	0.4	0.9
Pearl Millet (200 lb N/acre) ^{4,5,6}	6,000	7,500	3.8	4.8
Sorghum - Sudangrass (200 lb N/acre) ^{4,5,6}	7,500	8,775	4.8	5.6
Small Grain Forage (oat, wheat, etc.; 120 lb N/acre) ¹	4,500	5,400	2.9	3.5
Rhizoma Perennial Peanut ²	2,625	4,250	1.7	2.7
Cool-Season Clovers, prepared seedbed ^{3,5}	1,000	2,700	0.6	1.7
Alyceclover ³	1,125	2,360	0.7	1.5
Hairy Indigo ³	1,500	4,050	1.0	2.6

†Production data based on 25% reduction yield range of FSG G138XA311FL.

‡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
Introduced Warm Season Perennial Grasses												
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
Native Warm Season Perennial Grasses												
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
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
Legumes or Legume/Grass Combinations												
Rhizoma Perennial Peanut			0.05	0.15	0.14	0.15	0.20	0.18	0.14			
Cool Season Annual Grasses												
Small Grains (Wheat, Rye, etc.)	0.18	0.2	0.2	0.16	0.08						0.02	0.16
Warm Season Annual Grasses												
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 to sloping, well drained soils formed 20 to 40 inches of sandy marine deposits over loamy marine deposits. These soils occur on summits, shoulders, and back slopes of marine terraces. Diagnostic subsurface horizon is an argillic horizon. The organic matter content of the surface layer is dominantly very low or low. Unless limed, the reaction in the surface layer ranges from very strongly 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: Dominantly 0 to 8 percent

Surface Texture: Fine sand, sand, loamy fine sand, loamy sand

Sand Content of Surface Layer: 83 to 97 percent

Clay Content of Surface Layer: 1 to 8 percent

Organic Matter Content of Surface Layer: 0.5 to 4 percent

Cation Exchange Capacity of Surface Layer (meq/100g):
 1.3 to 5.7

Effective Cation Exchange Capacity of Surface Layer (meq/100g): 0.3 to 3.1

Bulk Density of Surface Layer (g/cc): 1.2 to 1.6

Saturated Hydraulic Conductivity of Surface Layer: Rapid or very rapid

Saturated Hydraulic Conductivity of Surface Layer: Rapid or very rapid

Soil Reaction of Surface Layer: 4.5 to 6.5 (unless limed)

Available Water Capacity (0 to 30 inches): 0.4 to 1.5 inch per inch

Depth to Finer Textured Material: 20 to 40 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 below the surface

Flooding: None. A few members are rarely or very rarely flooded with brief duration.

Ponding: None

Monthly precipitation (inches) and temperature (F):

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Precip avg	4.89	3.82	5.09	3.28	3.27	6.23	6.84	7.12	4.86	2.98	2.69	3.34
Avg Min	41.1	43.6	49.4	54.3	62.0	68.5	71.1	70.8	67.9	57.7	50.0	43.2
Avg Temp	55.1	56.3	62.3	67.5	74.4	79.6	81.6	81.2	78.4	69.8	62.4	55.4
Avg Max	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, L.S. 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. -----, and C.G. Chambliss. 2000. Cool-Season Forage Variety Trials, WFREC, Jay, FL 1999-2000. Univ. Florida, IFAS, Florida Exp. Stn. SS-AGR-85.
4. -----, 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. WF00-03
5. ----- . 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. WF01-03.
6. ----- . 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.
7. 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-

State Correlation: (NA)

Forage Suitability Group Approval:



Greg Hendricks, State Resource Conservationist



Tom Weber, State Soil Scientist

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