

FORAGE SUITABILITY GROUP

Sandy Over Loamy Soils on Rises, Knolls, and Ridges of Mesic Uplands

FSG No.: G138XA221FL

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

Map Unit List

- Bonneau fine sand, 0 to 5 percent slopes
- Bonneau fine sand, 2 to 5 percent slopes
- Bonneau fine sand, 5 to 8 percent slopes
- Bonneau sand, 0 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 the pH level 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*)
 - Big Bluestem (*Andropogon gerardii*)
 - 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 sorghums, 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*)
- Hairy Vetch (*Vicia villosa*)
- Medics (*Medicago* spp., pH 5.5-8.0)

Seasonal and Total Production Estimates

Seasonal and total forage production is expected to be less variable than FSG G138XA121FL because finer textures soils are closer to the surface, which will improve water holding capacity. This will decrease drought effects, but total annual production still is driven largely by rainfall. Yields can increase by > 1,000 lbs/acre in years with above average rainfall. However greatly reduced production and even stand loss associated with over grazing 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 and short term drought periods in the summer months. Total production of all forage species is expected to be higher than FSG G138XA121FL but less than other groups, with a general growth curve still 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 G138XA321FL. 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, see FSG G138XA321FL for production information

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 ba-

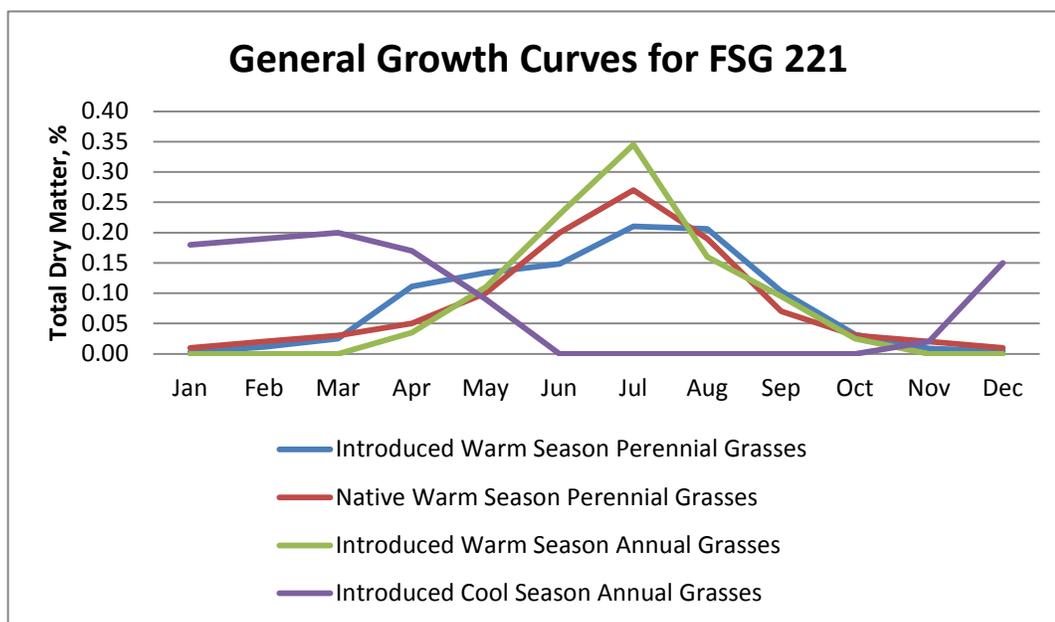
hiagrass pastures, or when a bloat preventative supplement is fed.

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,#}	3,950	10,900	2.5	7.0
Bahiagrass, Pensacola (100-200 lb N/A) ^{4,5,6}	3,700	10,150	2.4	6.5
Bahiagrass, Tifton 9 (100-200 lb N/A) ^{4,5,6}	6,100	11,500	3.9	7.4
Bermudagrass, Tifton 85 (100-200 lb N/A) ^{4,5,6}	5,640	11,750	3.6	7.5
Bermudagrass, Florakirk (100-200 lb N) ^{2,4,5,6}	5,900	11,277	3.8	7.2
Bermudagrass, Coastal (100-200 lb N/A) ^{4,5,6,7}	3,250	10,800	2.1	6.9
Big Bluestem (100-300 lb N/acre) ^{4,5,6}	780	1,800	0.5	1.2
Rhizoma Perennial Peanut ²	3,150	5,670	2.0	3.6
Pearl Millet (200 lb N/acre) ^{4,5,6}	7,200	10,000	4.6	6.4
Sorghum - Sudangrass (200 lb N/acre) ^{4,5,6}	9,000	11,700	5.8	7.5
Small Grain Forage (oat, wheat, etc.; 120 lb N/acre) ¹	5,400	7,200	3.5	4.6
Cool-Season Clovers, prepared seedbed ^{3,5}	1,200	3,600	0.8	2.3
Alyceclover ³	1,350	3,150	0.9	2.0
Hairy Indigo ³	1,800	5,400	1.2	3.5

†Production data based on 10% reduction 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
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, moderately well drained or 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, but ranges to 10 percent

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

Sand Content of Surface Layer: 82 to 95 percent

Clay Content of Surface Layer: 1 to 7 percent

Organic Matter Content of Surface Layer: 0.5 to 4.0

Cation Exchange Capacity of Surface Layer (meq/100g):
 0.3 to 4.8

Effective Cation Exchange Capacity of Surface Layer (meq/100g): 0.2 to 3.1

Bulk Density of Surface Layer (g/cc): 1.38 to 1.65

Saturated Hydraulic Conductivity of Surface Layer: Rapid

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

Available Water Capacity (0 to 30 inches): 0.3 to 2.0 inch per inch

Depth to Finer Textured: 20 to 40 inches

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

Drainage Class (Agronomic): Moderately well, well

Depth to Seasonal High Water Table (during wet periods): 3.0 to 5.0 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. 89-9.

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