FORAGE SUITABILITY GROUP

Sandy Over Loamy Soils on Knolls and Ridges of Mesic Uplands

FSG No.: G154XB211FL

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

Map Unit List

Hague sand, 5 to 8 percent slopes
Kendrick fine sand, 0 to 5 percent slopes
Kendrick fine sand, 5 to 8 percent slopes
Kendrick loamy sand, 0 to 5 percent slopes
Kendrick loamy sand, 5 to 8 percent slopes
Kendrick sand, 0 to 5 percent slopes
Kendrick sand, 2 to 5 percent slopes
Kendrick sand, 5 to 8 percent slopes
Wicksburg 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 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 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)

Legumes
- Warm season (Introduced)
  - Alyceclover (*Alysicarpus vaginalis*)
  - Cowpea (*Vigna unguiculata*)
  - Hairy Indigo (*Indigofera hirsuta*)

Seasonal and Total Production Estimates

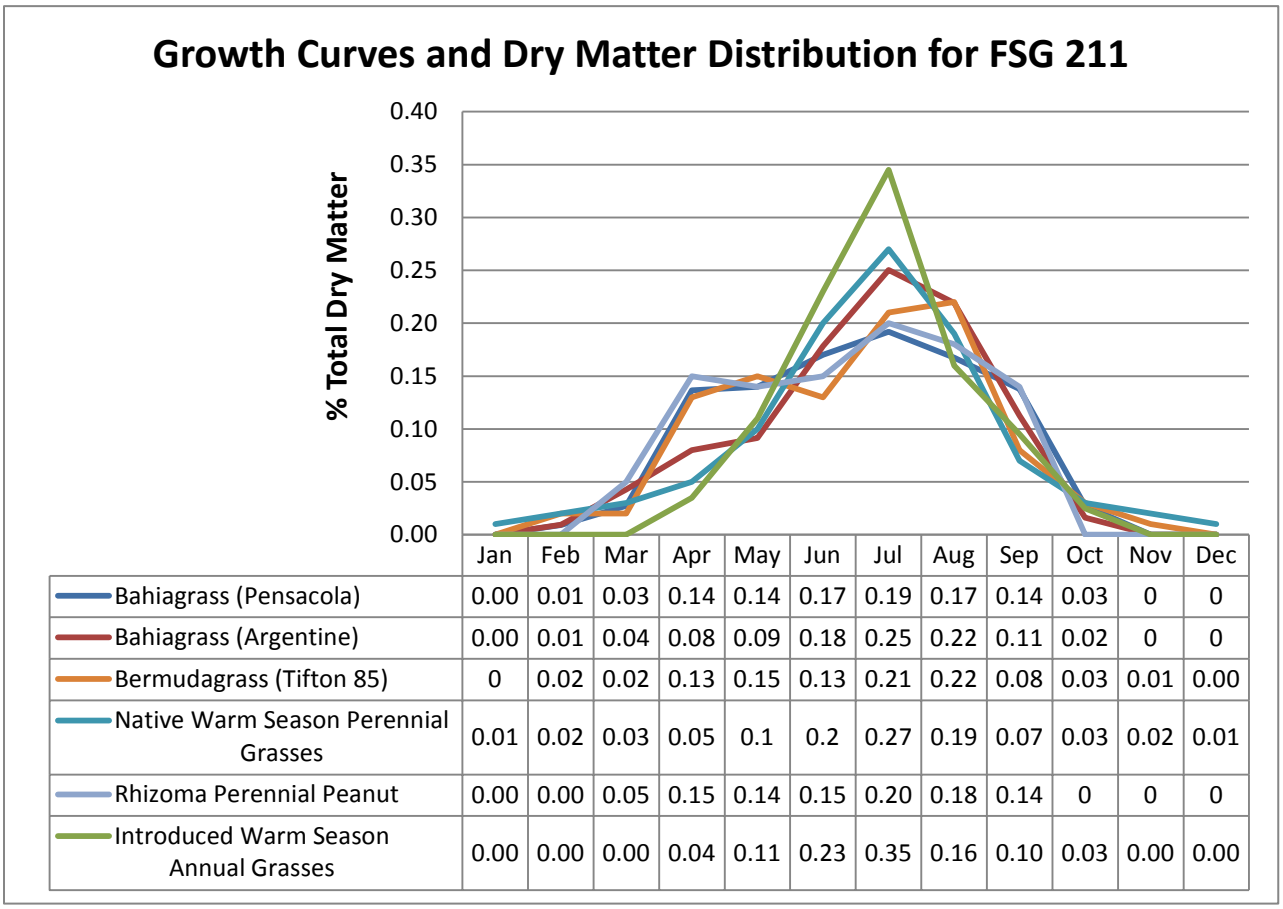
Seasonal and total forage production is better for this FSG compared to FSG G154XB111FL. Although depth to seasonal water table is in excess of 6 feet for the soils in this FSG, loamy sands occur at a depth of 20 to 40 inches below the surface. This makes the water holding capacity of the soils in this FSG somewhat higher than those in FSG G154XB111FL. 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 FSG G154XB111FL. Growth curves for warm season perennial forages will still be weighted more towards the later part of the growing season.

Cool season forage production is very limited due to decreased and sporadic rainfall during winter months (November-March) and depth to water table, therefore no cool season forages are recommended and no production data is given.

Expected Range in Dry Matter Production and Animal Unit Months (AUM) for Different Forages†				
Forage	**Range in Dry Matter Yield, lb/acre**		**Range in AUM/acre‡**	
Bahiagrass (0 lb N/acre)[5]#	3,100	3,500	2.0	2.2
Bahiagrass (60 lb N/acre)[5,9]	5,000	6,000	3.2	3.8
Bermudagrass (400 lb N/acre)[4]	17,500	20,000	11.2	12.8
Switchgrass, Alamo[1]	7,500	8,000	4.8	5.1
Rhizoma Perennial Peanut, Florigraze[3,7]	8,750	10,000	5.6	6.4
Pearl Millet (limited irrigation,≈400 lb N/acre) [6]	10,000	16,000	6.4	10.3
Alyceclover[8]	3,750	5,000	2.4	3.2
Hairy Indigo[2]	7,500	12,000	4.8	7.7

† Production data based on 25% increase in lower yield range values from FSG G154XB111FL.
‡Animal Unit Month based on 50% grazing efficiency and 2.6% intake per day.
#Superscript numbers refer to references.

Production Curves:



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bahiagrass (Pensacola)	0.00	0.01	0.03	0.14	0.14	0.17	0.19	0.17	0.14	0.03	0	0
Bahiagrass (Argentine)	0.00	0.01	0.04	0.08	0.09	0.18	0.25	0.22	0.11	0.02	0	0
Bermudagrass (Tifton 85)	0	0.02	0.02	0.13	0.15	0.13	0.21	0.22	0.08	0.03	0.01	0.00
Native Warm Season Perennial Grasses	0.01	0.02	0.03	0.05	0.1	0.2	0.27	0.19	0.07	0.03	0.02	0.01
Rhizoma Perennial Peanut	0.00	0.00	0.05	0.15	0.14	0.15	0.20	0.18	0.14	0	0	0
Introduced Warm Season Annual Grasses	0.00	0.00	0.00	0.04	0.11	0.23	0.35	0.16	0.10	0.03	0.00	0.00

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 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: 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	3.04	2.89	3.69	2.40	3.52	6.86	7.17	7.36	6.22	2.79	2.38	2.47
Avg Min	48.1	49.6	54.4	58.5	65.0	70.7	72.3	72.5	71.0	61.0	56.6	51.0
Avg Temp	60.0	61.5	66.4	68.6	76.6	80.8	81.8	81.8	80.4	74.2	67.5	61.5
Avg Max	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. -------. 2000. Plant materials adaption study final report, Belleview-Perry sprayfield. Brooksville, FL, USA: US Department of Agriculture, Natural Resources Conservation Service, Brooksville Plant Material Center Brooksville, Florida. 25 p.
2. Baltensperger, D.D., E.C. French, G.M. Prine, O.C. Ruelke, and K.H. Quesenberry. Hairy indigo a summer legume for Florida. Gainesville, FL, USA: University of Florida, Institute of Food and Agricultural Sciences, Agriculture Experiment Station, Circular S-318. 12 p. Available at: http://ufdc.ufl.edu/UF00055246/00001. Accessed 17 December 2012.
3. Beltranena, R., J. Breman, and G. Prine. 1981. Yield and quality of Florigraze rhizoma peanut (*Arachis glabrata* Benth.) as affected by cutting height and frequency. Proceedings Soil Crop Science Society Florida 40:153-156.
4. Coleman, S., and M. Williams. 2007. Bermudagrass yield and quality through the grazing season. In: Proceedings USDA-ARS STARS Field Day; 25 May 2007; Brooksville, FL, USA. Brooksville, FL, USA: US Department of Agriculture, Agriculture Research Service.
5. Engibous, J.C., W.J. Friedmann, and M.B. Gillis. 1958. Yield and quality of pangolagrass and bahiagrass as affected by rate and frequency of fertilization. Soil Science Society of America Journal. 22:423-425. Available at: https://www.agronomy.org/publications/sssaj/abstracts/22/5/SS0220050423. Accessed 17 December 2012.
6. Green, V.E., Jr., D.W. Gorbet, L.S. Dunavin, Jr., H.A. Peacock, J.T. Johnson, R.S. Kalmbacher, C.G. Chambliss, R.J. Allen, Jr., G.M. Prine, A.M. Akhanda, B.R. Tyree, and P.H. Everett. 1978. Statewide uniform tests with grain sorghums, silage sorghums, annual summer grasses (sorghum x sudangrasses and pearl millets) and sweet sorghums (sorgos). Gainesville, FL, USA: Department of Agronomy, University of Florida, Agronomy Research Report AG 78-7. 95 p.
7. Williams, M.J. 1994. Growth characteristics of rhizoma peanut and nitrogen-fertilized bahiagrass swards. Agronomy Journal 86:819-823. Available at: https://www.agronomy.org/publications/aj/abstracts/86/5/AJ0860050819. Accessed 17 December 2012.
8. Williams, M.J., C.G. Chambliss, and J.D. Brolmann. 1993. Potential of 'Savanna' stylo as a stockpiled forage for the subtropical USA. Journal of Production Agric. 6:553-556.
9. Williams, M.J., and R.S. Kalmbacher. 1996. Renovation effects on bahiagrass productivity. Agronomy Journal 88:191-198. Available at: (https://www.agronomy.org/publications/aj/abstracts/88/2/AJ0880020191. Accessed 17 December 2012.

State Correlation: (NA)

Forage Suitability Group Approval:

Greg Hendricks, State Resource Conservationist

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FL NRCS
December 2012

Appendix 1: Climate Station Locations		
COOP ID (FL=08)	**Location**	**County**
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