FORAGE SUITABILITY GROUP

Sandy Soils on Strongly Sloping to Steep Side Slopes of Xeric Uplands

FSG No.: G154XB113FL

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

Soil Series List

Due to the large list of map units in this group, please refer to Appendix 1.

Apopka
Astatula
Candler
Lake
Paola

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. 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:

Annual species are not recommended due to erosion hazard associated with steep slope.

Seasonal and Total Production Estimates

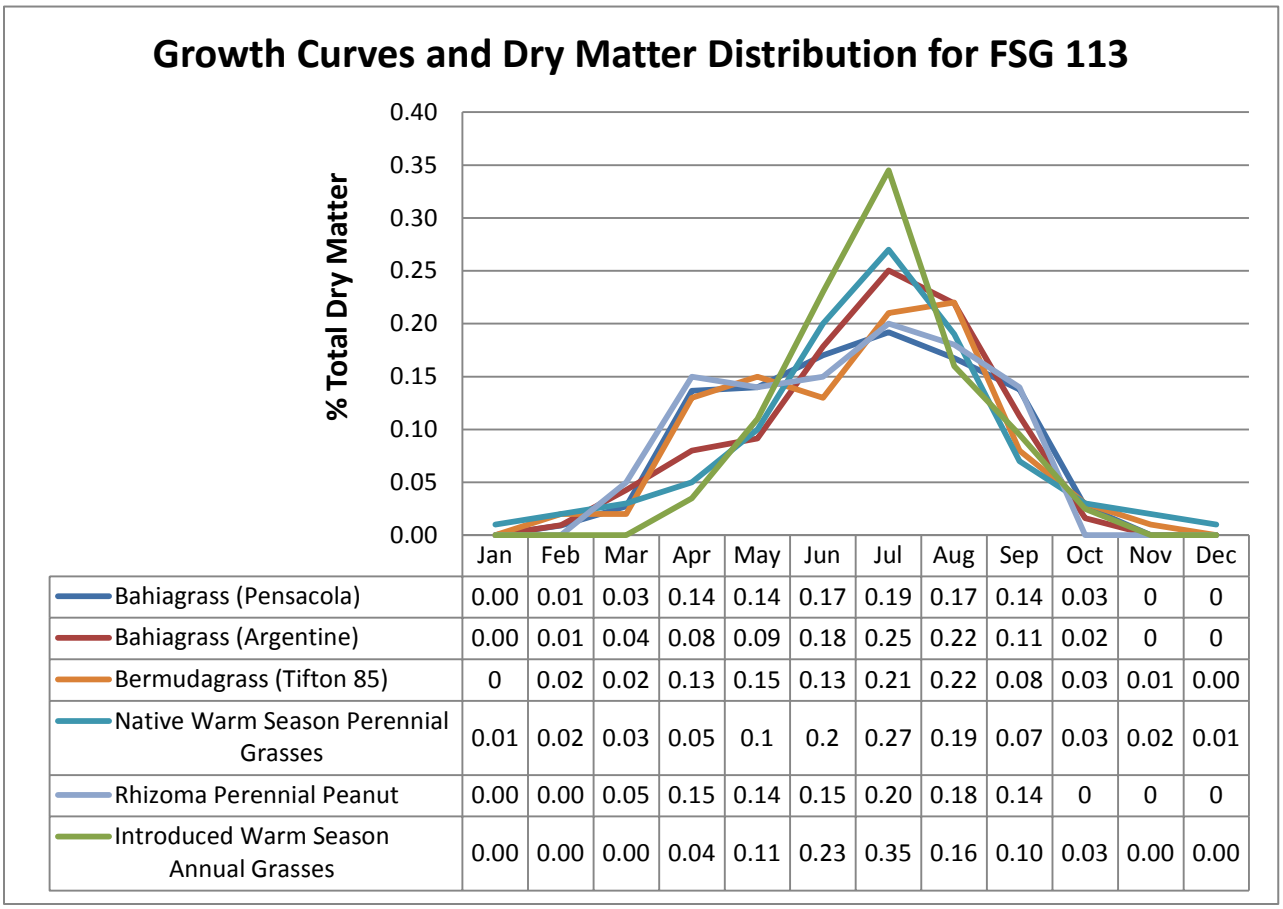
Seasonal and total forage production is limited in this group due to soils being somewhat excessively to excessively drained. Surface and subsurface texture is predominantly sandy with low or very low available water capacity, and a seasonal high water table greater than 6 feet. Strong slopes (dominantly 8-30 percent) also further inhibit forage production by decreasing rainfall infiltration and increasing surface runoff. These factors increase drought effects. Total annual production 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, steep slopes, decreased water infiltration, and increased soil erosion potential. 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 considerably less than other FSG, with a general growth curve 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), 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)[4]#	1,900	2,600	1.2	1.7
Bahiagrass (60 lb N/acre)[4,6]	3,000	4,500	1.9	2.9
Bermudagrass (400 lb N/acre)[3]	10,500	15,000	6.7	9.6
Switchgrass, Alamo[1]	4,500	6,000	2.9	3.8
Rhizoma Perennial Peanut, Florigraze[2,5]	5,250	7,500	3.4	4.8

† Production data based on a 25% decrease from FSG G154XB111FL due to steeper slopes.
‡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, strongly sloping to very steep, somewhat excessively or excessively drained soils formed in eolian or sandy marine deposits. These soils occur on back slopes of marine terraces. These soils have 40 inches to greater than 80 inches of fine sand or sand. Diagnostic subsurface horizon is an argillic horizon below 40 inches or is absent. The organic matter content of the surface layer is dominantly very low or 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: Dominantly 8 to 30 percent, but ranges between 5 and 85 percent

Surface Texture: Fine sand, sand, loamy sand

Sand Content of Surface Layer: 84 to 99 percent

Clay Content of Surface Layer: 0.2 to 8 percent

Organic Matter Content of Surface Layer: 0.5 to 3 per cent

Cation Exchange Capacity of Surface Layer (meq/100g): 0.2 to 3.2

Effective Cation Exchange Capacity of Surface Layer (meq/100g): 0.1 to 4.2

Bulk Density of Surface Layer (g/cc): 1.3 to 1.7

Saturated Hydraulic Conductivity of Surface Layer: Rapid or very rapid

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

Available Water Capacity (0 to 30 inches): 0.1 to 0.6 inch per inch

Depth to Finer Textured Material: 40 to more than 80 inches

Depth to Bedrock: Greater than 80 inches

Drainage Class (Agronomic): Well, somewhat excessive, excessive

Depth to Seasonal High Water Table (during wet periods): More 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
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 2)

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. 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.
3. 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.
4. 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.
5. 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.
6. 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

Tom Weber, State Soil Scientist

Appendix 1: Map Unit List
Apopka sand, 5 to 12 percent slopes
Astatula and Candler sands, 12 to 20 percent slopes
Astatula and Candler sands, 5 to 12 percent slopes
Astatula fine sand, rolling
Astatula sand, 12 to 20 percent slopes
Astatula sand, 5 to 12 percent slopes
Astatula sand, dark surface, 8 to 17 percent slopes
Candler fine sand, 8 to 12 percent slopes
Candler sand, 12 to 40 percent slopes
Candler sand, 5 to 12 percent slopes
Candler sand, 8 to 12 percent slopes
Lake sand, 12 to 22 percent slopes
Lake sand, 5 to 12 percent slopes
Paola sand, 5 to 12 percent slopes
Paola sand, 8 to 17 percent slopes

Appendix 2: 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