FORAGE SUITABILITY GROUP

Loamy and Clayey Soils on Knolls and Ridges of Mesic Uplands

FSG No.: G154XB311FL

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

Map Unit List

Kendrick sand, thin subsurface
Zuber loamy sand, 2 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 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*)
- 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 greater depth to permanent water table. 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.

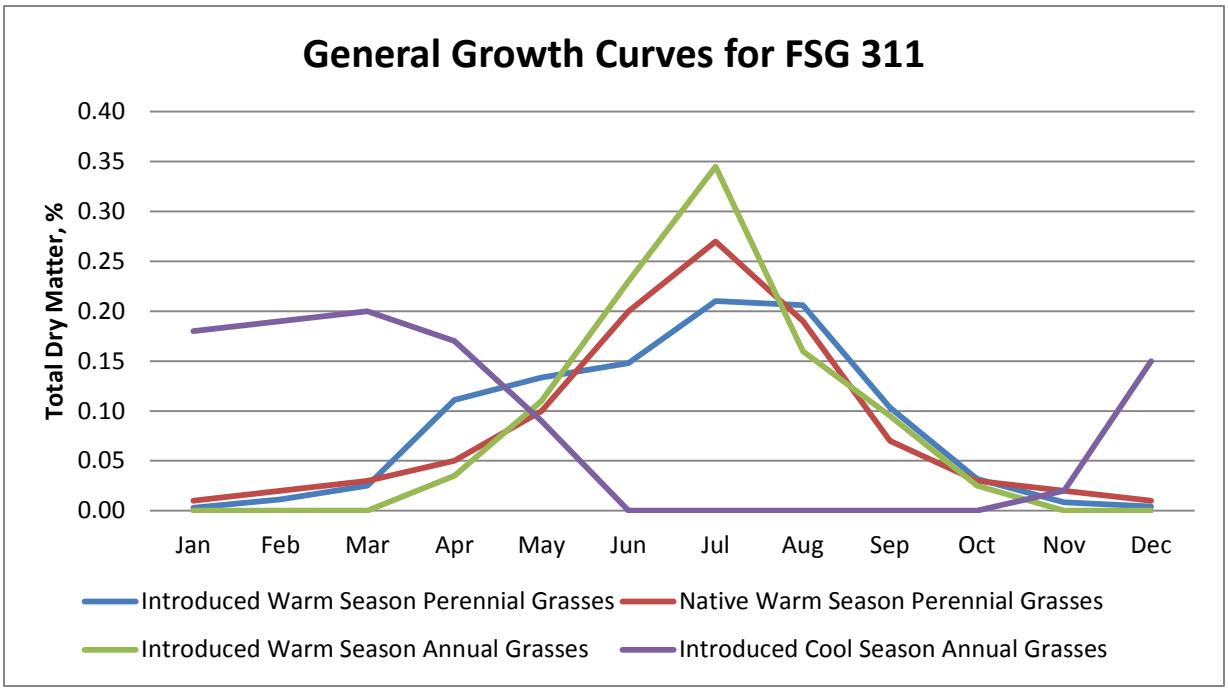
For this forage suitability group with a depth to permanent water >6 ft, use of cool season forages such as annual ryegrass, oats, and wheat planted in a prepared seedbed should be similar to FSG G154XB321FL only during years of above average rainfall (El Niño winters). Additionally in the southern portion of the MLRA, warm temperatures persisting into the fall and returning quickly in the spring greatly shorten the production period for cool season forages. Thus in the southern portion of the MLRA, cool season forages in this forage suitability group generally will still only produce sufficient winter grazing in years with average rainfall for specialized management uses such as creep grazing, early weaning, or purebred operations. In more northerly locations in the MLRA or throughout the MLRA when above average rainfall occurs (El Niño winters), planting winter annual forages for use as a winter feed supply for the whole cow herd may be practical. Overseeding annual ryegrass on a bahiagrass pasture is not recommended for this forage suitability group, except 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. White clover, red clover, and crimson clover planted in a prepared seedbed, 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 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)[5,6,7]#	4,400	10,900	2.8	7.0
Bahiagrass, Pensacola (100-200 lb /A)[5,6,7]	4,100	10,150	2.6	6.5
Bahiagrass, Tifton 9 (100-200 lb N/A)[5,6,7]	6,800	11,500	4.4	7.4
Bermudagrass, Tifton 85 (100-200 lb N/A)[5,6,7]	6,270	11,700	4.0	7.5
Bermudagrass, Florakirk (100-200 lb N)[2,5,6,7]	6,570	11,300	4.2	7.2
Bermudagrass, Coastal (100-200 lb N/A)[5,6,7,10]	3,600	10,800	2.3	6.9
Eastern Gamagrass, Pete (100-300 lb N/A)[5,6,7]	4,000	6,750	2.6	4.3
Big Bluestem (100-300 lb N/acre)[5,6,7]	870	1,800	0.6	1.2
Ryegrass (120 lb N/A)[3,4]	3,530	7,200	2.3	4.6
Small Grain Forage (oat, wheat, etc.; 120 lb N/acre)[1]	6,000	7,200	3.8	4.6
Pearl Millet (200 lb N/acre)[5,6,7]	8,000	10,000	5.1	6.4
Sorghum - Sudangrass (200 lb N/acre)[5,6,7]	10,000	11,700	6.4	7.5
Rhizoma Perennial Peanut[2]	3,500	5,650	2.2	3.6
Alfalfa[8,9]	9,000	11,700	5.8	7.5
Cool-Season Clovers, overseeded on bahiagrass[4,6,7]	300	1,100	0.2	0.7
Cool-Season Clovers, prepared seedbed[4,6]	1,330	3,600	0.9	2.3
Alyceclover[4]	1,500	3,150	1.0	2.0
Hairy Indigo[4]	2,000	5,400	1.3	3.5

†Production data based on 10% reduction in upper yield range of FSG G154B321FL.
‡Animal Unit Month based on 50% grazing efficiency and 2.6% intake per day.
#Superscript numbers refer to references.



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
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
Legumes or Legume/Grass Combinations												
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		
Cool Season Annual Grasses												
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
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 or gently sloping, well drained soils formed in loamy and/or clayey marine deposits. These soils occur on summits, 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 very low to medium. 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: 0 to 5 percent

Surface Texture: Dominantly loamy sand, loamy fine sand, sandy loam or fine sandy loam. A few members are loam, sandy clay, clay, sand, or fine sand.

Sand Content of Surface Layer: 32 to 95 percent

Clay Content of Surface Layer: 4 to 42 percent

Organic Matter Content of Surface Layer: 0.5 to 4 percent

Cation Exchange Capacity of Surface Layer (meq/100g): 1.2 to 13.6

Effective Cation Exchange Capacity of Surface Layer (meq/100g): 0.3 to 7.8

Bulk Density of Surface Layer (g/cc): 1.35 to 1.68

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 1.1 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 40 and 80 inches.

Drainage Class (Agronomic): Well

Depth to Seasonal High Water Table (during wet periods): Greater 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 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.
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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

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