FORAGE SUITABILITY GROUP

Loamy and Clayey Soils on Flats of Hydric or Mesic Lowlands

FSG No.: G154XB341FL

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

Map Unit List

Bradenton fine sand
Eaton loamy sand
Emeralda fine sandy loam
Eureka loamy fine sand
Eureka loamy sand, thick-surface variant
Manatee loamy fine sand
Meggett loamy sand
Paisley fine sand
Paisley fine sand, bouldery subsurface
Paisley fine sand, stony subsurface
Paisley loamy fine sand
Rains loamy fine sand

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, but irrigation may be warranted for cool season forages in this FSG. 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*)
- Stargrass (*Cynodon nlemfuensis*, adapted on these soils only south of I-4*)*
- Limpograss (*Hemarthria altissima*)

Warm season (Native)

- Big Bluestem (*Andropogon gerardii*, northern half of MLRA)
- Purple Bluestem (*Andropogon glomeratus* var. *glaucopsis*)
- 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; additional management required for high water table)
- 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

- Aeschynomene (*Aeschynomene americana*)
- Hairy Indigo (*Indigofera hirsuta*)

Cool season

- White Clover (*Trifolium repens*, pH 6.0-7.5)
- Berseem Clover (*Trifolium alexandrinum*, pH 6.5 – 8.0)
- Ball Clover (*Trifolium nigrescens,* pH >6.5*)*

Seasonal and Total Production Estimates

Soils in this FSG are similar to FSG G155X241FL in all characteristics except the surface texture runs from fine sand to clay and depth to finer textured material is less than 20. Spring production should be better than either FSG G155XB141FL or FSG G155X241FL due to better water holding capacity, particularly in the southern half of the MLRA where temperatures should not be limiting to warm season grass growth.

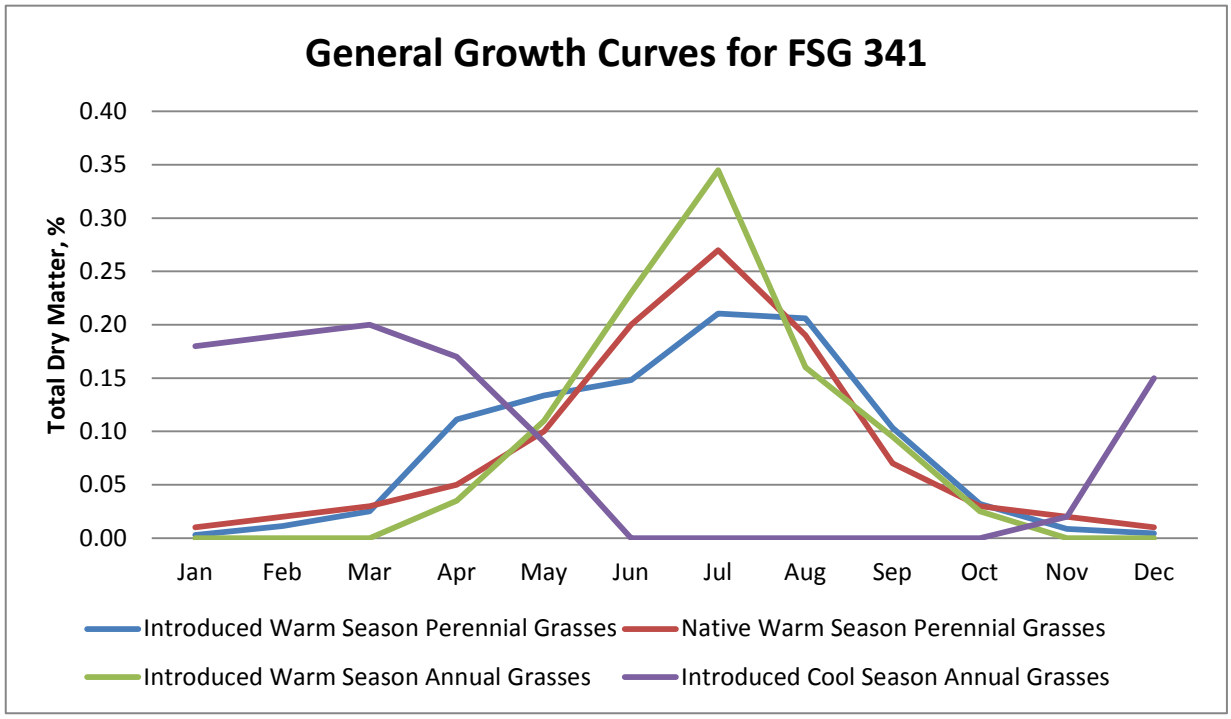
For this FSG, production of cool season forages such as annual ryegrass, oats, and wheat planted in a prepared seedbed should be equal to or better than FSG G155XB241FL due to the better water holding capacity of the subsoil. Limited and sporadic rainfall during fall and winter months, particularly in the southern half of this MLRA, will still limit use of cool season annuals. 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 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. While in more northerly locations in the MLRA, planting winter annual forages for use as a winter feed supply for the whole cow herd should be practical most years. In years of above average winter rainfall (El Niño winters), cool season forage growth may be limited on this FSG throughout the MLRA due to saturated soil conditions. Overseeding annual ryegrass on a bahiagrass pasture should be practical in this FSG throughout the MLRA.

For similar reasons, winter legumes should be more productive, particularly in the northern portion of the MLRA during years of normal winter rainfall. White clover, ball clover, and berseem clover should be considered on this FSG, particularly in the northern half of the MLRA. Although in years with above normal winter rainfall (El Niño winters), high water table may reduce yield . Grazing management and fertilization need to favor the legume component for persistence, productivity, and seed production when natural reseeding of annual clovers is desired. Grazing management for seed production also is important for white clover, which is normally considered a perennial species, but functions more as an annual in Florida and thus is 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 when grazed, or when bloat preventative supplements are 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. Better water holding capacity of the subsoil should mitigate the effects of the typical April/May dry period. Once normal summer rainfall begins, plant production should resume. Warm season legumes such as aeschynomene and carpon desmodium can also 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. Improved grass varieties such as stargrass and limpograss may also be grown on these soils although stargrass is generally limited to the part of the MLRA south of the US I-4 corridor. Limpograss should be limited to soils where drainage has not been altered. Only bermudagrass cultivars known to be tolerant of saturated soil conditions should be used in this FSG.

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 (0 lb N/acre) [12, 13]#	3,300	6,600	2.1	4.2
Bahiagrass (60 lb N/acre)[13]	7,700	11,000	4.9	7.1
Carpon desmodium/Bahiagrass[6]	7,150	9,350	4.6	6.0
White clover/bahiagrass[12]	6,600	8,800	4.2	5.6
Bermudagrass, (200 lb N/acre)[8]	11,000	15,400	7.1	9.9
Stargrass (≈400 lb N/acre)[11]	12,100	16,500	7.8	10.6
Limpograss (≈400 lb N/acre)[4,11]	8,800	14,300	5.6	9.2
Rhizome Perennial Peanut[9]	8,800	15,400	5.6	9.9
Pearl Millet (225 to 300 lb N/acre)[1,3]	6,600	13,200	4.2	8.5
Sorghum X Sudangrass (225 to 300 lb N/acre)[1,3]	11,000	26,400	7.1	16.9
Aeschynomene[7]	2,200	3,300	1.4	2.1
Hairy Indigo[5]	2,200	3,300	1.4	2.1
Annual Ryegrass[2,10]	2,200	7,700	1.4	4.9

† Production data based on 10% increase from FSG G154XB141FL due to better winter/spring moisture.
‡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 (Jiggs)	0.01	0.01	0.02	0.13	0.14	0.13	0.21	0.22	0.09	0.02	0.01	0.01
Limpograss	0.01	0.01	0.02	0.13	0.14	0.13	0.21	0.22	0.09	0.02	0.01	0.01
Stargrass		0.01	0.02	0.06	0.14	0.15	0.19	0.19	0.11	0.09	0.03	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, poorly drained or very poorly drained soils formed in loamy and clayey marine deposits. These soils are on flats, slight depressions, or interfluves of marine terraces. Diagnostic subsurface horizon is an argillic horizon above 20 inches. A few members have either a mollic or umbric horizon. The organic matter content of the surface layer is dominantly 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: Dominantly 0 to 2 percent, but ranges to 3 percent

Surface Texture: Dominantly loamy fine sand, fine sandy loam, sandy loam, or their mucky analogs. A few members are sand, fine sand, clay, silty clay loam, sandy clay loam, silt loam, or loam.

Sand Content of Surface Layer: 3 to 95 percent

Clay Content of Surface Layer: 1 to 50 percent

Organic Matter Content of Surface Layer: 1.3 to 12 percent

Cation Exchange Capacity of Surface Layer (meq/100g): 3.5 to 14.4

Effective Cation Exchange Capacity of Surface Layer (meq/100g): 1.0 to 9.4

Bulk Density of Surface Layer (g/cc): 1.1 to 1.65

Saturated Hydraulic Conductivity of Surface Layer: Moderate to very rapid

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

Available Water Capacity (0 to 30 inches): 0.3 to 2.3 inch per inch

Depth to Finer Textured Material: Less than 20 inches

Depth to Bedrock: Greater than 80 inches. Some members have bedrock at less than 80 inches.

Drainage Class (Agronomic): Poorly, very poorly

Depth to Seasonal High Water Table (during wet periods): 0 to 1 foot

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:

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State Correlation: (NA)

Forage Suitability Group Approval:

Greg Hendricks, State Resource Conservationist

Tom Weber, State Soil Conservationist

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