

FORAGE SUITABILITY GROUP

Sandy Over Loamy Soils on Flats of Hydric or Mesic Lowlands

FSG No.: G155XB241FL

Major Land Resource Area (MLRA 155): Southern Florida Flatwoods

Soil Series List

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

Boca	Pineda
Felda	Pinellas
Floridana	Pople
Ft. Green	Riviera
Heights	Wauberg
Mulat	Wauchula

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*)
- 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 rimpau*)

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 G155XB141FL in all characteristics except the presence of a loamy sand subsoil at 20 to 40 inches. Total production of warm season forage species is expected to be more consistent than for FSG G155XB141FL. Better production can be expected during the spring due to better water holding capacity of the subsoil, particularly in the southern half of the MLRA where temperatures should not be limiting to warm season grass growth.

For this FSG, use of cool season forages such as annual ryegrass, oats, and wheat planted in a prepared seedbed can be more productive than FSG G155XB141FL 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 and above average rainfall (El Niño winters) 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 may be practical most years. Overseeding annual ryegrass on a bahiagrass pasture also is not recommended in the southern end of this MLRA, due to excessive competition from bahiagrass for soil moisture, but should be a better option in the northern portions of the MLRA.

For similar reasons, winter legumes should be more productive, particularly in the northern portion of the MLRA. White clover, berseem clover, and ball clover 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 is desired. Grazing management for seed production also is important for white clover, normally considered a perennial species, 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, or when a bloat preventative supplement is fed.

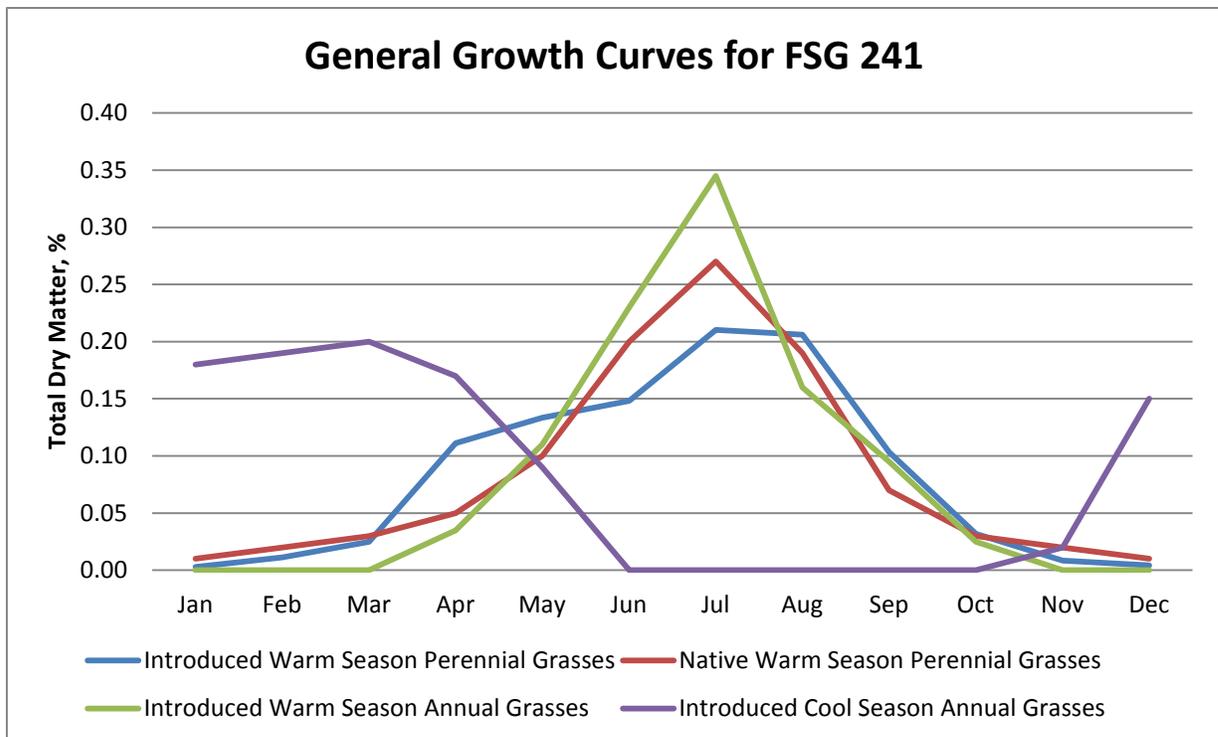
Initial growth of perennial warm season grasses and legumes or establishment of warm season annual grasses may be delayed in the spring due to low rainfall. Better water holding capacity of the subsoil should mitigate the effects of the typical April/May dry period. Once normal summer rainfall begins, 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.

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} #	3,750	6,000	2.4
Bahiagrass (60 lb N/acre) ¹³	8,750	10,000	5.6	6.4
Carpon desmodium/Bahiagrass ⁶	8,100	8,500	5.2	5.4
White clover/bahiagrass ¹²	7,500	8,000	4.8	5.1
Bermudagrass, (200 lb N/acre) ⁸	12,500	14,000	8.0	9.0
Stargrass (≈400 lb N/acre) ¹¹	13,750	15,000	8.8	9.6
Limpograss (≈400 lb N/acre) ^{4,11}	10,000	13,000	6.4	8.3
Rhizome Perennial Peanut ⁹	10,000	14,000	6.4	9.0
Pearl Millet (225 to 300 lb N/acre) ^{1,3}	7,500	12,000	4.8	7.7
Sorghum X Sudangrass (225 to 300 lb N/acre) ^{1,3}	12,500	24,000	8.0	15.4
Aeschynomene ⁷	2,500	3,000	1.6	1.9
Hairy Indigo ⁵	2,500	3,000	1.6	1.9
Annual Ryegrass ^{2,10}	2,500	7,000	1.6	4.5

†Production data based on 25% increase in lower range values for FSG G155XB141FL.

#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 (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 20 to 40 inches of sandy marine deposits over loamy or clayey marine deposits. These soils are on flats, slight depressions, or interfluves of marine terraces. Diagnostic subsurface horizon is an argillic horizon. The organic matter content of the surface layer is dominantly low to high. 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 337 d (range 290-365 d)

Length of growing season (>32° F 9 years in 10 at least): averages 309 d (range 253-365 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)

10a (30-35° F, Ft. Myers)

Mean annual precipitation (inches): averages 51.89 (range 45.66-69.53)

Soil Properties

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

Sand Content of Surface Layer: 82 to 98 percent

Clay Content of Surface Layer: 0.3 to 10 percent

Organic Matter Content of Surface Layer: 0.5 to 12 percent

Cation Exchange Capacity of Surface Layer (meq/100g): 1.4 to 9.9

Effective Cation Exchange Capacity of Surface Layer (meq/100g): 0.3 to 4.9

Bulk Density of Surface Layer (g/cc): 1.25 to 1.6

Saturated Hydraulic Conductivity of Surface Layer: Rapid

Soil Reaction of Surface Layer: 3.5 to 6.5 (unless limed). A few members have a pH between 6.5 and 8.4.

Available Water Capacity (0 to 30 inches): 0.3 to 2.4 inch per inch

Depth to Finer Textured Material: 20 TO 40 inches

Depth to Bedrock: Dominantly 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 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	2.70	2.59	3.37	2.39	3.90	7.26	6.98	7.14	6.75	3.50	2.66	2.24
Avg Min	50.2	51.4	55.7	59.6	65.5	70.8	72.3	72.7	71.6	63.9	58.9	53.0
Avg Temp	62.3	63.5	67.8	70.5	77.1	81.1	82.0	82.3	81.1	75.8	69.6	63.9
Avg Max	72.7	74.4	78.6	82.7	87.5	90.2	91.5	91.3	89.5	84.8	79.2	74.0

Climate Station Locations (averages from 1971 to 2000; see Appendix 2)

FSG Documentation

Inventory Data References:

1. Adjei, M.B., and P. Mislevy. 1988. Forage yield and quality of summer annual grasses and legumes in central Florida. Gainesville, FL, USA: University of Florida, Range Cattle Agricultural Research and Education Center. RC-1988-3. 6 p.
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State Correlation: (NA)

Forage Suitability Group Approval:



Greg Hendricks, State Resource Conservationist



Tom Weber, State Soil Scientist

Appendix 1: Map Unit List
Boca fine sand
Boca fine sand, slough
Boca fine sand, slough
Boca sand
Felda fine sand
Floridana fine sand
Ft. Green fine sand
Ft. Green fine sand, 2 to 5 percent slopes
Heights fine sand
Mulat fine sand
Pineda fine sand
Pineda fine sand, limestone substratum
Pineda sand
Pineda sand, limestone substratum
Pineda-Pinellas fine sands
Pinellas fine sand
Pople fine sand
Riviera fine sand
Riviera sand, limestone substratum
Wauberg fine sand
Wauchula fine sand

Appendix 2: Climate Station Locations		
COOP ID (FL=08)	Location	County
8942	Titusville	Brevard
3163	Fort Lauderdale	Broward
7397	Punta Gorda	Charlotte
2850	Everglades	Collier
4210	Immokalee	Collier
228	Arcadia	DeSoto
5895	Moore Haven Lock	Glades
9401	Wauchula	Hardee
1654	Clewiston US Engin.	Hendry
2298	Devils Garden	Hendry
4662	La Belle	Hendry
236	Archbold Biol. Station	Highlands
369	Avon Park	Highlands
7205	Plant City	Hillsborough
8788	Tampa Intl. Air.	Hillsborough
9214	Vero Beach Muni. Air.	Indian River
9219	Vero Beach	Indian River
1641	Clermont	Lake
5076	Lisbon	Lake
3186	Fort Myers	Lee
6880	Parrish	Manatee
8620	Stuart	Martin
2137	Fort Drum	Okeechobee
6485	Okeechobee	Okeechobee
6628	Orlando Intl. Air.	Orange
4625	Kissimmee	Osceola
611	Belle Glade Exp. Stn.	Palm Beach
1276	Canal Point USDA	Palm Beach
5182	Loxahatchee	Palm Beach
9525	West Palm Beach Intl. Air.	Palm Beach
7851	St. Leo	Pasco
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
6065	Myakka River State Park	Sarasota
9176	Venice	Sarasota
7982	Sanford Orlando	Seminole
3874	Hastings ARC	St. Johns
7826	St. Augustine WFOY	St. Johns
3207	Fort Pierce	St. Lucie
1163	Bushnell	Sumter
2158	Daytona Beach Inter. Air.	Volusia
2229	Deland	Volusia