

FORAGE SUITABILITY GROUP

Sandy Soils, on Flats on Mesic and Hydric Lowlands

FSG No.: G155XB141FL

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.

.Adamsville, variant	.Holopaw	.Pomona
.Ankona	.Immokalee	.Pottsburg
.Basinger	.Jupiter	.Punta
.Browart, variant	.Lokosee	.Smyrna
.Captiva	.Malabar	.St. Johns
.Delray	.Myakka	.Tocoi
.EauGallie	.Myakka, variant	.Valkaria
.Ellzey	.Oldsmar	.Wabasso
.Farmton	.Ona	.Wabasso, variant
.Ft. Drum	.Palmetto	.Waveland
.Hallandale	.Placid	

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*)
- 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. *glaucoopsis*)
- Yellow Indiangrass (*Sorghastrum nutans*, northern half of MLRA)
- Lopsided Indiangrass (*Sorghastrum secundum*)
- Switchgrass (*Panicum virgatum*)

Legumes

Warm season (Introduced)

- Rhizoma Perennial Peanut (*Arachis glabrata*, pH 5.8-7.0; additional management required for high water table)
- Carpon desmodium (*Desmodium heterocarpum*)

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 rimpaui*)

Legumes and Forbs

Warm season

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

Cool season

- White Clover (*Trifolium repens*, pH 6.0-7.5)

Seasonal and Total Production Estimates

This soil group is the widest and most utilized for improved pastures in peninsular Florida, often referred to as a "Flatwoods" or "Prairie" soil. Surface and subsurface texture is predominantly fine sand or sandy soils with moderate water holding capacity, and a seasonal high water table ranging from 0 - 1 foot during wet periods. Soils are generally flat with a slope no greater than 5%, with very brief ponding following large seasonal rainfall events on some soils in this series. The ponding usually lasts less than 14 days with minimum to no negative impacts on production of adapted forage species. Irrigation and drainage is commonly used for crop production on these soils and can be found on old abandoned crop land converted to improved pastures; however, increases in forage yield related to drainage and irrigation are not well documented for these soils. Total production of all forage species is expected to be higher than other groups due to increased available water during the growing season.

For this FSG, use of cool season forages such as annual ryegrass, oats, and wheat planted in a prepared seedbed is dependent upon the location in the MLRA. Forage production is usually at the middle to lower end of the production range due to limited and sporadic rainfall during fall and winter months, particularly in the southern half of this MLRA. 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 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 due to better winter rainfall. 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 may be an option in the northern portions of the MLRA.

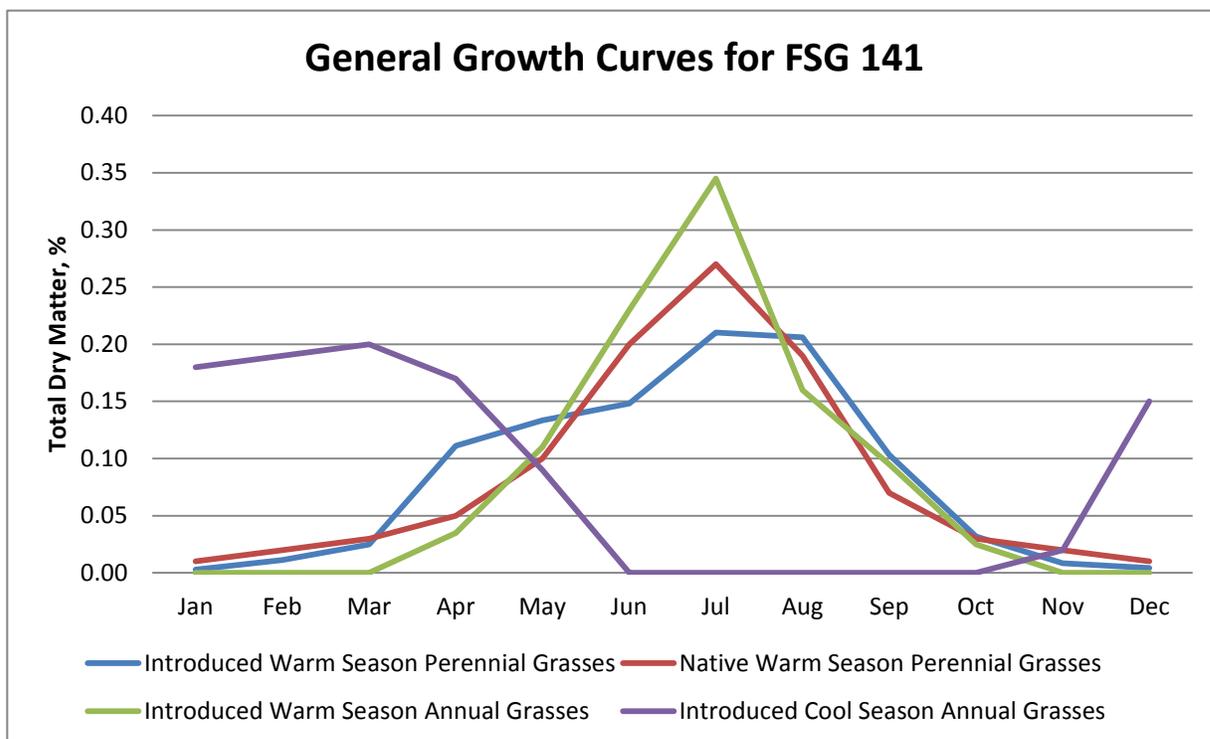
Similarly winter legumes are less productive the further south in the MLRA the site is located. White clover is the only winter legume recommended for this FSG due to its better tolerance to saturated soil conditions. Grazing management and fertilization need to favor the legume component for persistence. Even then, reseeding every other year may be necessary. White clover, which is 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, white clover should be used only in mixtures unless bloat preventative treatments 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. Often production of perennial species also dips during the 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} ‡	3,000	6,000	1.9
Bahiagrass (60 lb N/acre) ¹³	7,000	10,000	4.5	6.4
Carpon desmodium/Bahiagrass ⁶	6,500	8,500	4.2	5.4
White Clover/Bahiagrass ¹²	6,000	8,000	3.8	5.1
Bermudagrass, (200 lb N/acre) ⁸	10,000	14,000	6.4	9.0
Stargrass (≈400 lb N/acre) ¹¹	11,000	15,000	7.1	9.6
Limpograss (≈400 lb N/acre) ^{4,11}	8,000	13,000	5.1	8.3
Rhizome Perennial Peanut ⁹	8,000	14,000	5.1	9.0
Pearl Millet (225 to 300 lb N/acre) ^{1,3}	6,000	12,000	3.8	7.7
Sorghum X Sudangrass (225 to 300 lb N/acre) ^{1,3}	10,000	24,000	6.4	15.4
Aeschynomene ⁷	2,000	3,000	1.3	1.9
Hairy Indigo ⁵	2,000	3,000	1.3	1.9
Annual Ryegrass ^{2,10}	2,000	7,000	1.3	4.5

†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 in sandy marine deposits. These soils are on flats, slight depressions, or interfluves. These soils have 40 inches to greater than 80 inches of fine sand or sand. Diagnostic subsurface horizons are either a spodic horizon within 30 inches, an argillic horizon below 40 inches or both. Some soils lack a diagnostic subsurface horizon. A few members have either a mollic or umbric horizon. The organic matter content of the surface layer is dominantly medium or 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

Percent S: 0 to 2 percent, but ranges to 5 percent

Surface Texture: Fine sand, sand, loamy fine sand

Sand Content of Surface Layer: 86 to 99 percent

Clay Content of Surface Layer: 0.4 and 7 percent

Organic Matter Content of Surface Layer: 0.5 to 6 percent, a few members may range up to 10 percent

Cation Exchange Capacity of Surface Layer (meq/100g): 0.1 to 6.5

Effective Cation Exchange Capacity of Surface (meq/100g): 0.1 to 11.2

Bulk Density of Surface Layer (g/cc): 1.2 to 1.6

Saturated Hydraulic Conductivity of Surface: Rapid or very rapid

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

Available Water Capacity (0 to 30 inches): 0.2 to 2.5 inch per inch

Depth to Finer Textured: 40 to more than 80 inches

Depth to Bedrock: Dominantly more than 80 inches. A few 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	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:

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State Correlation: (NA)

Forage Suitability Group Approval:



Greg Hendricks, State Resource Conservationist



Tom Weber, State Soil Conservationist

Appendix 1: Map Unit List

Adamsville variant fine sand (FL081)†	Myakka fine sand, shell substratum
Ankona fine sand	Myakka sand
Basinger fine sand	Myakka variant fine sand
Basinger sand	Oldsmar fine sand
Broward variant fine sand	Oldsmar fine sand, limestone substratum
Captiva fine sand	Oldsmar sand
Captiva fine sand	Oldsmar sand, limestone substratum
Delray complex	Ona fine sand
Delray-EauGallie complex	Ona fine sand, orstein substratum
Delray-Pomona complex	Palmetto fine sand
EauGallie and Immokalee fine sands	Palmetto sand
EauGallie and Myakka fine sands	Placid fine sand
EauGallie fine sand	Pomona fine sand
EauGallie sand	Pomona sand
Ellzey fine sand	Pompano fine sand
Farmton fine sand	Pompano sand
Ft. Drum fine sand	Pottsburg fine sand
Hallandale fine sand	Punta fine sand
Hallandale fine sand, slough	Smyrna fine sand
Hallandale sand	Smyrna sand
Holopaw fine sand	St. Johns and EauGallie fine sands
Holopaw sand	St. Johns fine sand
Holopaw sand, limestone substratum	St. Johns fine sand, 2 to 5 percent slopes
Immokalee fine sand	St. Johns-Myakka complex
Immokalee sand	Tocoi fine sand
Jupiter fine sand	Valkaria fine sand
Lokosee fine sand	Valkaria sand
Malabar fine sand	Wabasso fine sand
Malabar fine sand, high	Wabasso fine sand, rarely flooded
Malabar sand	Wabasso sand
Myakka and EauGallie fine sands	Wabasso sand, limestone substratum
Myakka fine sand	Wabasso variant fine sand
Myakka fine sand, 0 to 2 percent slopes	Waveland fine sand
Myakka fine sand, 2 to 5 percent slopes	

†Number in parenthesis refers to soil survey code where map unit occurs.

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