FORAGE SUITABILITY GROUP

Loamy and Clayey Soils on Flats of Hydric or Mesic Lowlands

FSG No.: G133AA341FL

Major Land Resource Area (MLRA 133A):

Southern Coastal Plain

Map Unit List

Bladen loam, rarely flooded
Grady loam, drained
Pansey sandy loam
Pansey sandy loam, 1 to 3 percent slopes
Rains fine sandy loam
Weston fine sandy loam, 0 to 2 percent

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. 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*)
- Limpograss (*Hemarthria altissima*)

Warm season (Native)

- Big Bluestem (*Andropogon gerardii*)
- Purple Bluestem (*Andropogon glomeratus* var. *glaucopsis*)
- Yellow Indiangrass (*Sorghastrum nutans*)
- 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)

Annual Species:

Grasses

Warm season

- Browntop Millet (*Urochloa ramosa*; =*Panicum ramosum*)
- Pearl Millet (*Pennisetum glaucum*)
- Sorghum (*Sorghum bicolor*; includes forage sorghums, 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 G133AA241FL in all characteristics except the surface texture runs from fine sand to clay and depth to finer textured material is less than 20 inches. Spring production should be better than either FSG G133AA141FL or FSG G133AA241FL due to better water holding capacity.

For this FSG, production of cool season forages such as annual ryegrass and small grains planted in a prepared seedbed should be equal to or better than FSG G133AA241FL due to the better water holding capacity of the subsoil. 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 annual grass forage growth may be limited on this FSG due to saturated soil conditions. Overseeding annual ryegrass on a bahiagrass pasture should be practical in this FSG throughout the MLRA.

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For similar reasons, winter legumes should be more productive than in the other FSG. Several clovers and other legumes should be considered on this FSG. 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, which is weak a perennial in Florida and 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.

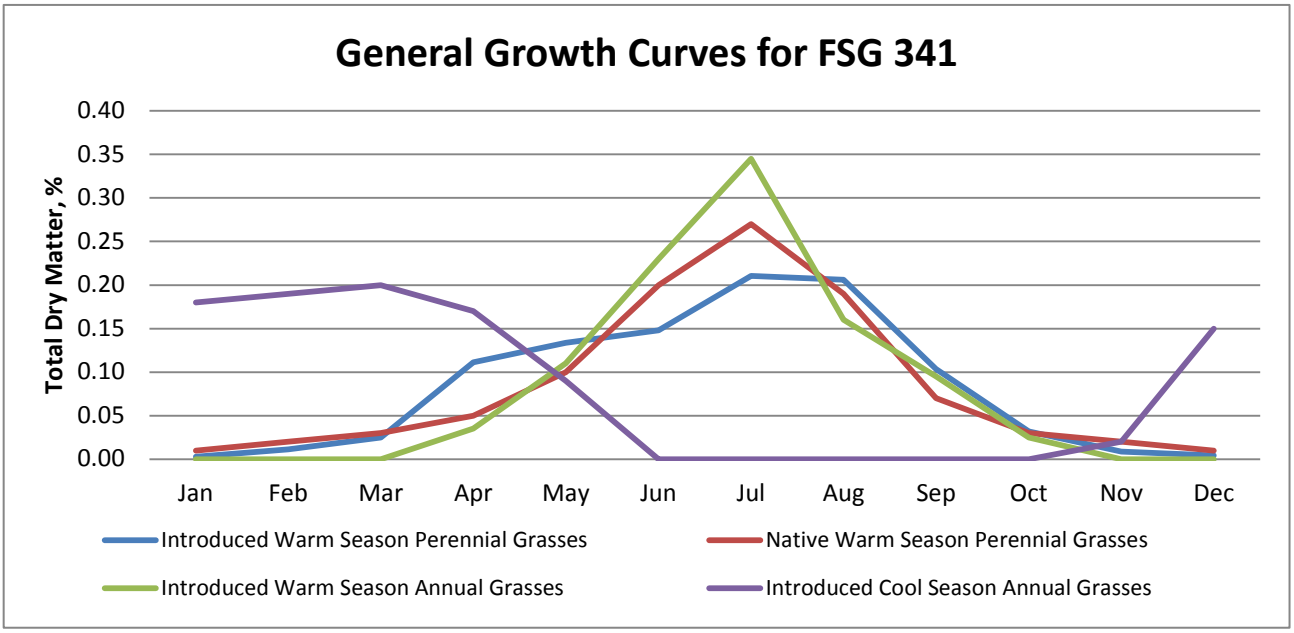
Initial growth of perennial warm season grasses and legumes or establishment of warm season annual grasses may be delayed in the spring due to low rainfall. Better water holding capacity of the subsoil should mitigate the effects of the typical April/May dry period. Once normal summer rainfall begins, plant production should resume. Warm season legumes such as aeschynomene 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. 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) [15,16]#	3,750	6,000	2.4	3.8
Bahiagrass (60 lb N/acre)[16]	8,750	10,000	5.6	6.4
White clover/bahiagrass[15]	7,500	8,000	4.8	5.1
Bermudagrass, (200 lb N/acre)[12]	12,500	14,000	8.0	9.0
Limpograss (≈400 lb N/acre)[9,14]	10,000	13,000	6.4	8.3
Eastern Gamagrass, Pete (100-300 lb N/A)[5,6,7]	4,000	6,750	2.5	4.3
Big Bluestem (100-300 lb N/acre)[5,6,7]	900	1,800	0.6	1.2
Pearl Millet (225 to 300 lb N/acre)[1,8]	7,500	12,000	4.8	7.7
Sorghum X Sudangrass (225 to 300 lb N/acre)[1,8]	12,500	24,000	8.0	15.4
Ryegrass (120 lb N/A)[3,4]	3,500	7,200	2.2	4.6
Small Grain Forage (oat, wheat, etc.; 120 lb N/acre)[2]	6,000	7,200	3.8	4.6
Rhizoma Perennial Peanut[13]	10,000	14,000	6.4	9.0
Aeschynomene[11]	2,500	3,000	1.6	1.9
Hairy Indigo[10]	2,500	3,000	1.6	1.9
Cool-Season Clovers, overseeded on bahiagrass[4,6,7]	300	1,080	0.2	0.7
Cool-Season Clovers, prepared seedbed[4,6]	1,300	3,600	0.8	2.3

†Production data based on 25% increase in lower range values for FSG G133AA141FL for introduced warm season species and production similar to FSG G133AA231 for warm season natives and cool season species.
‡Animal Unit Month based on 50% grazing efficiency and 2.6% intake per day.
#Superscript numbers refer to references.

Production Curves:



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
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
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			
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 255 d (range 243-273 d)

Length of growing season (>32° F 9 years in 10 at least): averages 224 d (range 205-247 d)

Annual minimum temperature (° F in month of January): averages 38.2 (range 36.7-39.7)

USDA Plant Hardiness Zone: 8b (15-20° F, Tallahassee)

Mean annual precipitation (inches): averages 62.14 (range 53.18-69.48)

Group Soil Properties (Statewide)

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	4.80	6.37	3.78	4.45	6.36	7.04	6.32	5.24	3.31	4.16	4.09	4.80
Avg Min	38.2	40.8	46.9	99.8	60.8	67.8	70.7	70.3	66.4	54.6	46.5	41.3
Avg Temp	51.6	54.9	61.2	67.0	74.4	80.2	82.1	81.8	78.7	69.9	61.5	54.4
Avg Max	62.2	66.1	72.5	78.7	85.3	90.1	91.5	91.0	88.0	80.3	71.9	64.5

Climate Station Locations (averages from 1971 to 2000; see Appendix 1)

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. Univ. Florida, Range Cattle AREC. Research Rep. RC-1988-3. 6 p.
2. 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. Univ. Florida, IFAS, Florida Coop. Ext. Ser. SS-AGR-46.
3. Dunavin, L.S. 1997. Cool-Season Forage Trials, 1996-1997. Univ. Florida, IFAS, Florida Agric. Exp. Stn., WFREC Res. Rep. WF97-5.
4. --------, and C.G. Chambliss. 2000. Cool-Season Forage Variety Trials, WFREC, Jay, FL 1999-2000. Univ. Florida, IFAS, Florida Exp. Stn. SS-AGR-85.
5. --------, and D.W. Gorbet. 2000. Variety and Other Trials of Several Forage Grasses and Legumes, Temperate Corn and Grain Sorghum. Univ. Florida, IFAS, Florida Agric. Exp. Stn., WFREC Res. Rep. WF00-03.
6. -------. 2001. Variety and Other Trials of Several Forage Grasses and Legumes, Temperate Corn and Grain Sorghum. Univ. Florida, IFAS, Agric. Exp. Stn., WFREC Res. Rep. WF01-03.
7. -------. 2002. Variety and Other Trials of Several Forage Grasses and Legumes and Grain Sorghum. Univ. Florida, IFAS, Florida Agric. Exp. Stn., WFREC Res. Rep. WF02-03.
8. Green, V.E., Jr., D.W. Gorbet, L.S. Dunavin ,Jr., H.A. Peacock, J.T. Johnson, R.S. Kalmbacher, C.G. Chambliss, R.J. Allen, Jr., G.M. Prine, A.M. Akhanda, B.R. Tyree, and P.H. Everett. 1978. Statewide uniform tests with grain sorghums, silage sorghums, annual summer grasses (sorghum x sudangrasses and pearl millets) and sweet sorghums (sorgos). Dep. Agron., Univ. Florida. Agron. Res. Rep. AG 78-7. 95 p.
9. Kalmbacher, R.S., P.H. Everett, F.G. Martin, K.H. Quesenberry, E.M. Hodges, O.C. Ruelke, and S.C. Schank. 1987. Yield and Persistence of Perennial Grasses at Immokalee, Florida: 1981 to 1984. Univ. Florida, IFAS, Agric. Exp. Stn., Bull. 865. (http://ufdc.ufl.edu/UF00027614/00001?search=kalmbacher, accessed August 22, 2011).
10. Kalmbacher, R.S., E.M. Hodges, and F.G. Martin. 1980. Effect of Plant and Cutting Height on Yield and Quality of *Indigofera hirsuta*. Tropical Grassld. 14:14-18.
11. Mislevy, P., R.S. Kalmbacher, and F.G. Martin. 1981. Cutting Management of the Tropical Legume American Jointvetch. Agron. J. 73:771-775 (https://www.agronomy.org/publications/aj/abstracts/73/5/AJ0730050771, accessed September 29, 2011).
12. Mislevy P., O.P. Miller, and F.G. Martin. 2008. Influences of Grazing on *Cynodon* Grasses in Peninsular Florida. Online. Forage and Grazinglands doi: 10.1094/FG-2008-0429-01-RS. (http://www.plantmanagementnetwork.org/pub/fg/research/2008/cynodon; accessed August 19, 2011).
13. Mislevy, P., M.J. Williams, A.S. Blount, and K.H. Quesenberry. 2007. Influence of Harvest Management on Rhizoma Perennial Peanut Production, Nutritive Value, and Persistence on Flatwoods Soils. Online. Forage and Grazinglands. doi:10.1094/FG-2007-1108-01-RS. (http://www.plantmanagementnetwork.org/pub/fg/research/2007/harvest/; accessed August 19, 2011).
14. Newman Y.C., A. Agyin-Birikorang, M.B. Adjei, J.M. Silveira, J.M.B. Vendramini, J.E. Rechcigl, and L.E. Sollenberger. 2009. Nitrogen Fertilization Effect on Phosphorus Recommendation Potential of Three Perennial Warm-Season Forages. Agron. J. 101:1243-1248. (https://www.soils.org/publications/aj/pdfs/101/5/1243, accessed August 22, 2011).
15. Prine, G.M., C. Ruelke, C.E. Dean, and D.D. Baltensperger. 1984. Performance of Winter Forage Legumes at Gainesville, Florida Over Eight Growing Seasons 1975-76 to 1982-83. Univ. Florida, IFAS. Agron. Res. Rep. AY 84-10. 32 p.
16. Sumner S., W. Wayne, J. Selph, J. Southwell, V. Hoge, P. Hogue, E. Jennings, P. Miller, and T. Seawright. 1991. Fertilization of Established Bahiagrass Pasture in Florida. Univ. Florida, IFAS, Agric. Exp. Stn., Cir. 916. (http://rcrec-ona.ifas.ufl.edu/pdf/publications/fertilization-established-bahia-pasture-FL.pdf; accessed August 20, 2011).

State Correlation: Pending

Forage Suitability Group Approval:

Rosalind Moore, Acting State Resource Conservationist

Tom Weber, State Soil Scientist

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Appendix 1: Climate Station Locations		
COOP ID (FL=08)	**Location**	**County**
1544	Chipley	Washington
1986	Crestview	Okaloosa
2220	De Funiak Springs	Walton
3230	Fountain	Bay
5275	Madison	Madison
5793	Milton Exp. Stn.	Santa Rosa
5879	Monticello	Jefferson
6240	Niceville	Okaloosa
7429	Quincy	Gadsden
8758	Tallahassee Mun. Air.	Leon