

# Forage Alternatives For Florida Cattle

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Grasses are the backbone of the Florida livestock industry. Different grasses are used for different purposes depending on season of year (warm or cool season), soil conditions (dry or wet), age of livestock utilizing the forage (mature cattle or weaned calves), management methods used (continuous or rotational grazing), fertilization program, etc. These are some of the management factors that need to be considered when selecting a grass. This paper will specifically address warm season grasses best suited for Florida.

## Warm Season Perennial Grasses

### *Bahiagrass*

**Cultivars recommended:** Tifton 9, Pensacola, Argentine, and Paraguay 22.

**Seedbed preparation:** There are various methods to prepare a clean seedbed for pasture or hay field establishment.

1. Pasture renovation via winter annual forages (ryegrass or small grains). Plowing, rototilling or discing of an old pasture followed by a single chopping or discing to level field (if needed), seeding, cover seed, (use grove disc in closed position) and roll.
2. Pasture renovation via complete vegetation control (Roundup<sup>®</sup>) followed by sod seeding.
3. Pasture renovation after a vegetable crop. Periodic discing immediately after completion of vegetable removal or Tifleaf

millet (March to June) followed by complete tillage.

4. Complete tillage (March to April) as indicated in one above without winter annual, followed by periodic discing.
5. Complete vegetation control (Glyphosate) followed by tillage practices described in one.

**Establishment:** Bahiagrass is established from seed. Seedbed should be well prepared and should be 100% free of vegetation at least 2 months prior to seeding. Seeding can be done using a grain drill or cyclone seeder attached to the back of a truck or tractor. Bahiagrass seeding rate should be about 35 lb/acre. Seed should be applied uniformly over the soil and covered by discing, with grove disc in the closed position. The objective is to cover the seed with about 0.5" soil followed by a firm packing with a roller. No herbicides are cleared for use to control broadleaf weeds and sedges growing in newly seeded bahiagrass pastures. Weed control is accomplished by mowing each time weeds attain a height of 6", back to a 2 to 3" stubble. The broadleaf herbicide Weedmaster<sup>®</sup> can be applied at 1 qt/acre after bahiagrass plants have tillered usually 40 days after planting. The fertility program for establishing bahiagrass consists of 300 lb/acre of a 16-8-16, N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O + 2.0 lb/acre Zn, Cu, Mn, and Fe (sulfate form) + 0.2 lb/acre boron. Grasses should be ready for grazing 90 to 100 days after seeding.

**Management and utilization:** Bahiagrass can be grazed rotationally utilizing a 2 to 3 wk rest period or grazed continually. Rotational

grazing generally provides better utilization of the forage grass and improves persistence in some grasses. Research studies indicate Pensacola bahiagrass had an average gain of 0.6 lb/day with a live weight gain of 365 lb/acre when utilizing a stocking rate of 4 heifers (550 lb)/acre. Under grazing the fertilization program in both north and south Florida should be at least 100 lb N/acre/yr in a split application. The fertilization program for north Florida is different from south Florida. In north Florida with a medium N option (100 lb N/acre) and a soil test low to very low in P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O should receive about 25 lb/acre P<sub>2</sub>O<sub>5</sub> and 50 lb/acre K<sub>2</sub>O. In south Florida IFAS recommends only N on bahiagrass under grazing with no additional P or K. The application of 2 lb/acre/yr elemental Fe from sulfate will help keep bahiagrass from turning yellow in spring. Be sure to monitor bahiagrass pastures for mole cricket damage especially during August to October.

#### **Advantages:**

1. Low fertility input.
2. Will persist even when fertilizer is omitted or reduced.
3. Established from seed.
4. Persistent and long lived.
5. Good quality when properly grazed continuously or 2 to 3 wk rotation.
6. Will persist under continuous close grazing.
7. Can provide additional income with harvest of seed and/or sod.

#### **Disadvantages:**

1. Susceptible to mole crickets.
2. Average animal performance about 300 to 350 lb/acre live wt gain.

3. Produces 90% of its yield between April and September (warm season).
4. Little forage production during short days.
5. Not a good grass for hay.

Studies are being conducted trying to develop a new Pensacola bahiagrass that will produce at least 1 ton/acre additional forage during the winter (October to March) 6 months. Presently the first cross of the new bahiagrass has been developed and is being tested at Ona and Marianna. Clipping studies have been initiated to compare the new cross with Pensacola. Studies will continue over a 2 yr period on a year round basis to monitor dry forage yield, nutritional value, persistence, and cold tolerance.

### ***Bermudagrass And Stargrass***

**Bermudagrass cultivars recommended:** Tifton 85, Florakirk, Coastal, Jiggs.

**Stargrass cultivars recommended:** Ona, Florona, Florico and Okeechobee.

**Seedbed preparation:** See bahiagrass

**Preparation of vegetative material:** Good quality vegetative material must be produced or purchased for rapid grass establishment. Clean, 100% weed free (common bermudagrass free) plant material should be fertilized in late March with 100-50-100 lb/acre N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O + 2.0 lb/acre Zn, Cu, Mn, Fe (sulfate form) and 0.2 lb/acre Boron. Allow grass to grow about 90 days. About 3 wk before grass is cut for plant material apply 50 lb/acre N to encourage stem bud development. Perennial grasses treated with this 50 lb/acre N show signs of top growth and good root development within 5 to 7 days. Remember grasses cut for plant material (90 days) and grasses cut for hay (28 to 35 days) are different.

**Establishment:** Bermudagrasses and stargrasses must be vegetatively planted from tops (1500 lb/acre) on a clean (common bermudagrass free) seedbed. Preparation of the seedbed is similar to that discussed for bahiagrass. Good quality vegetative material can be crimped into the soil 3 to 4" deep or by discing to cover 50% of each stem, followed immediately by a firm packing. Seven days after planting, when signs of new growth appear, fertilize with 250 lb/acre of 16-8-16, N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O or equivalent plus 1.25 lb/acre Zn, Cu, Mn, Fe (sulfate form), and 0.12 lb/acre Boron. Also spray using 1.0 qt/acre Weedmaster® or equivalent 7 days after planting to control broadleaf weeds and sedges. About 35 days after planting apply a second application of fertilizer (50 lb/acre N). Grass should be ready to graze or cut for hay 65 days after planting.

**Management and utilization:** Both bermudagrass and stargrass produce high dry forage yields (7 to 8 ton/acre) during the warm season and 1.5 ton/acre during the cool season. Forage nutritive value is excellent when allowed a 4 to 5 wk rest period between grazing or hay cuts. A minimum stubble height of 3 to 4" needs to be maintained for bermudagrass and 6 to 8" for stargrass. Continuous close grazing of stargrass could jeopardize species persistence. Florona stargrass is very persistent and will tolerate continuous clipping at a 4" stubble. Florico stargrass will **not** tolerate close clipping or grazing or a frequent (2 wk) grazing period and requires a stubble height of 6 to 8". Therefore, Florico stargrass is not recommended for hay harvest. The fertility program for both stargrass and bermudagrass should consist of 200-30-60 lb/acre N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O for grazing (N split into four applications) and 75-30-60 lb/acre per hay harvest. Bermudagrass cultivars are generally low in hydrocyanic acid potential (HCN-p) whereas Florona, Florico, and Ona stargrass cultivars are high. Palatability and forage nutritive value of both bermudagrass and stargrass decreases rapidly after a freeze. Both

grasses will express a slow decline in CP (-3 percentage units) up to 4 wk following a freeze. However, IVOMD will drop immediately 5 to 6 percentage units 1 wk after a freeze and 15 to 18 units 4 wk after a freeze. Little difference exists in CP between cynodon cultivars harvested at the same time, averaging 17, 15, 13, 11, and 8% for grazing frequencies of 2, 3, 4, 5, and 7 wk. However large differences exist in digestibility between stargrasses and bermudagrasses with Florico stargrass and Tifton-85 and Florakirk bermudagrass having high digestibility similar to pangolagrass, and all four grasses being higher than Florona stargrass, Coastal, Jiggs, and Alicia bermudagrass. Both bermudagrasses and stagrasses respond well to N, yielding about 70 lb dry matter/acre/yr/lb of applied N, when harvested at a 4 to 5 wk frequency. Yearling steers grazing Florona and Florico stargrass had average daily gains of 0.9 and 1.2 lb and live weight gains of 590 and 720 lb/acre at a stocking rate of 3 (500 lb) animals/acre.

#### Advantages:

1. Florico and Florona stargrass and Tifton-85 bermudagrass produce excellent cattle average daily gains and live weight gains/acre, when allowed a 4 wk rest period between grazing.
2. Florakirk bermudagrass is a good yielding, high quality, fine stemmed grass used **for hay only**.
3. Florakirk, Jiggs, and Florona, make excellent growth during cool, frost-free, short-day conditions.
4. Grasses are very persistent with proper management.
5. Florona, Florakirk, Tifton-85, and Jiggs produce good yields of quality forage when harvested for hay every 4 to 5 wk.

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- 6. Rapid establishment from vegetative cuttings.
  - 7. Hay cures rapidly during favorable weather.
  - 8. Tolerant to spittle bugs, chinch bugs, mole crickets, etc.

**Disadvantages:**

- 1. Requires higher fertility than bahiagrass, limpograss, and pangolagrass.
- 2. Forage quality drops rapidly after 5 wk regrowth and after a freeze.
- 3. Top growth easily killed by frost.
- 4. Stargrasses should not be grown north of Orlando, however bermudagrasses have cold tolerance to middle Georgia.
- 5. Vegetatively propagated from stem pieces.

***Digitgrasses***

**Cultivars:** Pangolagrass, slenderstem, Transvala, and Taiwan

**Seedbed preparation:** See bahiagrass

**Preparation of vegetative plant material:**  
See bermudagrass and stargrass

**Establishment:** All digitgrasses must be vegetatively established from above ground stems or tops (See bermudagrass/stargrass establishment).

**Management and utilization:** Pangolagrass should be fertilized with 100-30-60 lb/acre N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O split into two applications for grazing. Each hay harvest should receive 75-30-60 lb/acre N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O. Pangolagrass should be rotationally grazed or harvested every 4 to 5 wk. Total seasonal dry forage yields averaged 3 and 6 ton/acre when harvested at 5 and 7 wk, respectively.

Pangolagrass averaged 14% (5wk) and 11% (7wk) crude protein and in vitro organic matter digestion of 62 and 59% for 5 and 7 wk, respectively, when averaged over June and September harvests. Pangolagrass produces little forage during late fall, winter, and early spring in central Florida. However in the Immokalee area studies showed pangolagrass produced 24% of total seasonal yield during the October to March period. Pangolagrass has poor persistence, due to a weak root system, consequently under grazing, pangolagrass is easily invaded by common bermudagrass, smutgrass, dog fennels, etc. This grass needs to be monitored closely during July to October for the presence of spittle bugs. These insects can completely destroy a pangolagrass stand. Plants will take on a brown bronze color in August, which is evidence of spittle bug damage. Burning the previous years stubble in January is the best control.

**Advantages:**

- 1. Excellent forage quality.
- 2. Excellent animal performance.
- 3. Good cattle consumption after stockpiled and/or frosted.
- 4. Grass holds quality and remains palatable when mature.
- 5. Makes excellent horse hay.

**Disadvantages:**

- 1. Not persistent, susceptible to invasion by common bermudagrass and other weeds.
- 2. Vegetatively planted.
- 3. Susceptible to spittle bug and yellow sugarcane aphid.
- 4. Weak root system.

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5. Little winter production in central Florida.

### **Limpograss (*Hemarthria*)**

**Cultivars recommended:** Floralta

**Seedbed preparation:** See bahiagrass

**Preparation of vegetative plant material:**  
See bermudagrass and stargrass

**Establishment:** The establishment of limpograss is similar to other vegetatively planted grasses like pangolagrass, bermudagrass, and stargrass, except limpograss must be sprayed with Banvel® and **not** Weedmaster 7 days after planting. The establishment of limpograss is slower than other grasses requiring about 90 to 120 days.

**Management and utilization:** Limpograss should be planted on heavy, wet soils. **Do not plant on deep, well drained sandy soils.** This grass will not persist under intensive grazing management. For best persistence, maintain an 8 to 10" stubble. Limpograss is an excellent forage for stockpiling from August to December, followed by winter grazing in lieu of hay. Grass holds digestibility well even when mature, however, crude protein is usually low. Digestibility averaged 57 and 63, 57 and 64, 57 and 60, 54 and 59% when grazed at 2, 4, 6, and 8 wk frequency, during August and October, respectively. Crude protein averaged 11.5 and 13.1, 7.9 and 10.7, 7.2 and 10.4, 4.4 and 7.1 when grazed at 2, 4, 6, and 8 wk frequency, during August and October, respectively. Fall stockpiled studies have shown that forage CP concentration will drop about 1 percentage unit between time of freeze and 4 wk post freeze and digestibility about 4 percentage units after 1 wk and an additional 5 percentage units 4 wk after a freeze. Fertility program is similar to pangolagrass, except Fe should be applied at 2 lb/acre elemental (sulfate form) with each fertilization.

### **Advantages:**

1. Can be stockpiled (September to December) and consumed during the cool season.
2. Has good digestibility even after plants mature.
3. Good yielder.
4. Prefers wet sites and will tolerate water logged conditions.
5. Will make good growth during the cool season.
6. Has considerable frost tolerance.
7. Will drop less in digestibility after a freeze than most grasses.

### **Disadvantages:**

1. Will not persist under close grazing.
2. Forage contains low protein concentration.
3. Plants susceptible to spittle bugs, chinch bugs, and mole crickets (dry sites).
4. Grass must be vegetatively planted.
5. Not adapted to dry, deep, sandy soils.
6. Requires 2 to 3 days longer to dry for hay compared with bermudagrass and stargrass.

### **Rhodesgrass**

**Cultivar recommended:** Callide

**Seedbed preparation:** See bahiagrass

**Establishment:** Plants establish from seed (10 to 12 lb/acre) when seeding is made on a clean, vegetative free, well prepared seedbed. Rhodesgrass germinates and establishes

rapidly. Plants can be lightly grazed 75 days after seeding.

**Management and utilization:** Forage yields are generally 20 to 30% lower than that obtained for bermudagrass and stargrass. Harvesting Callide at a 4 to 5 wk frequency produced a total warm season yield of 3.8 ton/acre DM or 37% increase above a 2 wk grazing frequency. Callide averaged 66% (4 wk grazing frequency) and 57% IVOMD (5 wk grazing frequency) which was 22 and 10% higher than bermudagrass and stargrass, respectively. No difference was found in CP concentration between rhodesgrass, bermudagrass, and stargrass. Allowing plants to attain seed head stage before harvesting or grazing results in low quality forage. Productivity of a stand is generally short, lasting only 3 to 5 years. Maximum yield is obtained the second year after planting. Plants generally respond to P fertilizers especially when N is applied. Plants are generally low in K and Mg and high in sodium. Rhodesgrass is affected by *Bipolaris* leaf spot, which causes leaf dieback and by *Fusarium graminium*, which attacks spikelets and causes seed loss. Observations in recent years indicate spittle bug (*Prosapia bicincla*) and southern chinch bug (*Blissus insularis*) will destroy Callide rhodesgrass stands. Broadleaf weed control on well developed plants can be accomplished by applying 1.5 lb/acre Weedmaster® or

equivalent. Fertility requirements similar to pangolagrass.

**Advantages:**

1. Warm season grass, which will make some vegetative growth during the cool season and will survive at temperatures down to 22 to 24° F.
2. Tolerates high salt and alkaline soils.
3. Shows good drought tolerance.
4. Establishes rapidly from seed.
5. Good forage quality when harvested at 4 to 5 wk rest period.

**Disadvantages:**

1. Short lived perennial grass.
2. Forage quality drops rapidly when plants are allowed to develop mature inflorescence or heads.
3. Seriously affected by spittle bugs, chinch bugs, lesser corn stalk borer, and leaf spot diseases.

**Notes:**

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