

# Cost of Pasture Establishment

## Bahia- and Bermudagrass Planting Steps

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Florida has approximately 3.5 million acres of improved pastures. Bahiagrass is planted in 2.5 million acres representing about 70% of this area and bermudagrass is prevalent in much of the remaining acreage. These grasses are used extensively for pasture grasses as well as for hay production supporting the livestock industry.

This paper presents a description of these two warm-season perennial grasses widely planted in the state, the detailed steps needed for establishment, and the costs involved in planting each of them. It also addresses the need to ‘stop and think’ about your reasons for planting or renewing your pastures. Two establishment cost budgets were considered and they are presented to serve as a template for establishment costs for other bermudagrass types, or other warm-season perennials grasses. They are also presented to guide your decision making when it comes to pasture establishment.

### Bahiagrass

In Florida, bahiagrass is planted more than any other improved grass. Two-thirds of improved pastures are planted with bahiagrass and some of its attractions to producers include its excellent adaptation, ease of management, persistence under low fertilization and close grazing, as well as its relatively simple planting and establishment practices. However, prospective growers need to be willing to compromise in quality and production because bahiagrass has some limitations compared to several of the hybrid bermudagrasses. In Florida, there are mainly three extensively used bahiagrass varieties: Pensacola, Tifton 9, and Argentine. Pensacola is more cold tolerant and produces more early and late season forage compared to Argentine. Tifton 9 is a selection from Pensacola

with better nutritive value and frost tolerance. It produces 25% more tonnage than Pensacola and also grows early in spring and later in the fall. Argentine is adapted to wetter soils and is less cold tolerant than the other varieties. Argentine is a good option for growers planning to overseed with oats or cool-season forages.

### Bermudagrass

Most of the bermudagrasses used in Florida are hybrids, or crosses between different bermudagrasses (See Table 1). These hybrids were made with the intent of increasing yield or response to fertilizer, quality, and cold tolerance. One downside of these hybrids is that they do not produce viable seeds and therefore must be propagated through vegetative material. The actual plants may put out some seed heads but the seeds in them are sterile or vain. One disadvantage of planting vegetative material is that it costs more to establish than those grasses planted from seed.

Although not commonly planted in Florida, there are some seeded bermudagrasses which have mainly been used in other Southeastern states. However, with the increase of small acreage operations in Florida seeded bermudagrasses will probably become more popular. These seeded types are commonly marketed as blends which usually contain varying percentages of ‘Giant,’ a seeded selection from Oklahoma, and ‘Common’ bermudagrass.

### Things to Consider Before Planting

When planning to plant a new pasture or renovate an old one, you may want to think about several items before proceeding any further. Your reasons for

planting are as critical as the selection of the actual forage species to plant because your goals will narrow your choices and will help determine the best plant or variety choice. This critical analysis will help you choose between planting bahiagrass (seed planting) or a high input hybrid bermudagrass (vegetative material planting) as well as help you consider the differences in establishment costs.

How long will you be using your pasture or hay meadow? Does your lease constrain you to produce hay in five years or less because you are surrounded by urban development? Or is the lease not a factor because you own the operation and sale of the ranch is not within sight? Are you new to the livestock production business and planning to get started soon, but working with limited time and labor? Or, are you a cow-calf or yearling producer who wants to maximize on animal production, but bahiagrass pastures are capping your daily gains and are not helping you meet your production goals? These are some examples which will influence your strategy and choice of species. Factors to consider before planting or establishment should include production goals, type of animal, management skills, and time and money available to manage the forage of choice.

## Steps for Pasture Establishment

### 1. Selection of site

To plant bahiagrass or bermudagrass you need to select sites that are well drained. If planting Tifton-9 bahiagrass, the ideal planting site would be one that has not already been planted with bahiagrass, such as a bermudagrass or crop field. This will help guarantee the purity of the stand.

### 2. Site preparation

Get your seedbed prepared ahead of time, if possible starting in the fall. Your planting site needs to be free from debris, trash, and weeds. Previous perennial vegetation will need to be destroyed. One approach is to apply herbicide; applying 5 quarts/acre of glyphosate (Roundup) and then following up with tillage will usually do the job. If you are renovating using this option, check with your county extension

agent or weed specialist for a complete listing of chemical alternatives and details of control procedure.

In many cases, your existing vegetation will require several disk passes. Use a disk harrow or other appropriate tillage tool to destroy the germinating grass. A common approach is to disk in November to cut the trash using a tandem disk, then disk again in January and/or February, as needed. Use a finishing disc or finishing tool to leave a smooth surface. Always take advantage of dry weather conditions to get your seedbed prepared and always plant in a well-prepared, weed-free, and moist seedbed.

Seed-bed preparation would also be a good time to soil test. Since you are four or five months ahead of planting and if your soil test calls for liming, you could put your lime in early enough to have the desired pH in the soil by the time you will actually plant. Remember lime and soil react when they come into contact, so you need to incorporate lime three to six months prior to planting to change the pH below that top inch of soil.

### 3. Contact seed source

#### ■ Bermudagrass

Hybrid bermudagrasses are established vegetatively from stem pieces (sprigs), not from seed. The seed is sterile. If planting in spring, do your planning and contact your sprig provider and sprigger in the fall, particularly if you are using sprigs as vegetative material. Try to obtain pure, clean planting material. Whenever possible, plant fresh, pure live sprigs or freshly cut tops, also known as 'green tops.' Never dig or cut more material that you would be able to plant in a day.

#### ■ Bahiagrass

This grass is established from seed and you can contact your seed store to see what cultivars are available. If planting in the spring, do your planning and contact your seed provider in the fall. If you wait until the spring, the seed providers will be booked and will put you at the end of their list, so you may miss the time when your soil is ready for the seed.

#### 4. Time to plant

##### ■ Bermudagrass

If using sprigs, the window for planting runs from the middle of February through July.

If using plant tops or 'green tops', the window for planting is reduced to June through July; during this time of year the weather is cloudy and rainy, and conditions that might desiccate green tops are minimized.

##### ■ Bahiagrass

Cost effective planting of this grass uses seed and not vegetative material. Because seed is used, this grass can be planted from mid February to mid August. However, late March through early May are drier months in Florida compared to late spring and summer and should be avoided, especially in south central Florida.

#### 5. How to plant?

##### ■ Bermudagrass

Use vegetative material that has been pre-conditioned. Pre-conditioned material is a nursery of bermudagrass planting material that is fertilized at the initiation of rains using 100-50-100 lb/acre  $N-P_2O_5-K_2O + 2$  lb/acre Zn, Cu, Mn, Fe, and 0.2 lb/acre of Boron. Let it grow for three months, and three weeks prior to cutting, apply 50 lb/acre to promote growing points (buds).

Plant the vegetative material two to three inches deep, using a commercial sprig planter, a crimper, or a disk covering 50% of the runners. Do not plant the material too deep or the sprigs will use all their energy trying to emerge from the soil and be left without reserves for growth.

##### ■ Bahiagrass

After the seedbed is prepared and before putting the seed in, pack the soil with a roller to seal in the moisture. Next, plant the seed  $\frac{1}{4}$  to  $\frac{1}{2}$  of an inch deep. Beware that a common mistake with bahiagrass planting is to bury the seed too deep. Using a cultipacker planter or any precision seeder helps in placing the seed at a uniform depth.

#### 6. Planting rate

##### ■ Bermudagrass

- Sprigs: The recommended planting rate is 30-40 bushels of dug sprigs/acre.
- Tops: 1,500 lb of tops/acre.
- Seeded Bermudas: 10 lb/acre (for non-coated seed) or 20 lb/acre (for coated seed)

##### ■ Bahiagrass

- Tifton 9: 15-20 lb/acre
- Pensacola: 20-30 lb/acre
- Argentine: 25-30 lb/acre

#### 7. Roller pack seedbed

After sprigging or planting tops, pack the soil with a roller to seal the moisture in the soil.

#### 8. Weed control and fertilization

##### ■ Bermudagrass

Seven to no more than ten days after planting, control the weeds and do a light fertilization using 30 lb of N/acre and the recommended phosphorus and potassium as indicated in the soil test.

After 30 to 40 days, about the time when the runners (or stolons) start to grow, do a second N fertilization of 70 lb/acre.

##### ■ Bahiagrass

Light fertilization of bahiagrass should be done once the seedlings have emerged about seven to ten days later. Unlike bermudagrass, the weed control in bahiagrass at seedling stage needs to be done mechanically by mowing. Seedlings of bahiagrass do not tolerate phenoxy-type herbicides like 2,4 D, or Banvel. These herbicides can be used once the grass is established and has reached eight inches in height.

#### 9. Utilization

Well fertilized grasses (either bahiagrass or bermudagrass) will form a dense plant stand in 60 to 90 days.

## 10. Cost of Establishment

### ■ Bahiagrass

(See Table 2).

### ■ Bermudagrass

(See Table 3).

## Concluding Remarks

The costs involved in pasture planting or renovation will affect your profit. Stop and consider your reasons for wanting to plant a seeded or vegetative type grass. The establishment cost budgets are tools for planning purposes that help the decision making.

Success in establishing a pasture or hay meadow is mainly determined by:

- a. Choosing an adapted variety to your area, management skills, and production goals.
- b. Guaranteeing the right field conditions where the newly planted material is weed free, and has all the moisture available.
- c. Providing adequate fertilization and management as the plant develops.

Table 1. Comparison of bermudagrass hybrid varieties recommended or with potential for Florida.

Grass	Winter survival	Rhizomes	Rust	Digestibility	Protein
Tifton 85*	3.5	Some	N	1	1
Tifton 44*	1	V many	N	4	3
Jiggs*†	1	NA	Y	6	5
Russell*†	2	V many	N	6	NA
Coastal*	3	Many	N	6	3
Florakirk (Callie hybrid)	4	NA	Y	3	3
Alicia ‡	3.5	V many	Y	9	3

Ratings: 1 = best, 9 = poorest (adapted from Glen Burton, Univ. of Georgia).

NA = not available.

\* Adaptation or potential for north-central Florida.

†= Information is not available for north-central Florida.

‡= Not recommended due to low quality, lack of cold tolerance, and susceptibility to rust.

Table 2. Establishment costs per acre (Bahagrass) - 2007.†

Concept	Unit	Quantity	Unit price (\$)	Total
<b>A. Operating costs</b>				
<b>Soil preparation</b>				
Plowing	Passes	1.00	2.60	2.60
Disking	Passes	2.00	3.30	6.60
<b>Planting and fertilization ‡</b>				
Seed (early spring-middle Aug)	lb	20.00	2.70	54.00
Planter	Passes	1.00	1.41	1.41
Cultipacking	Passes	1.00	1.22	1.22
Nitrogen (7-10 days AP)	lb	30.00	0.40	12.00
Nitrogen (30 days AP)	lb	50.00	0.40	20.00
P2O5 (low - soil test) (7-10 days AP)	lb	25.00	0.33	8.25
K2O (low - soil test) (7-10 days AP)	lb	25.00	0.23	5.75
K2O (low - soil test) (30 days AP)	lb	25.00	0.23	5.75
Micronutrients*	lb	6.15	5.00	30.75
Lime (2 ton per acre every 2 yr)	ton	1.00	20.00	20.00
<b>Weed control</b>				
Mowing (planting to 6 inches)**	Passes	2.00	2.20	4.40
Herbicide after 6 inches	Gals	0.25	7.00	1.75
Labor	hr	2.00	8.50	17.00
Interest (operating cost)	\$	191.48	0.09	17.23
<b>Total operating costs</b>				<b>208.71</b>
<b>B. Ownership costs</b>				
Tractor & machinery (depreciation, insurance, taxes)	Acre	1.00	21.10	21.10
Land charge	Acre	1.00	25.00	25.00
Miscellaneous overhead (10% of total operating costs)	\$	208.71	10.00%	20.87
<b>Total ownership costs</b>				<b>45.87</b>
<b>C. Total costs (A + B) (Bahagrass establishment per acre)</b>				<b>254.58</b>

†This budget is for planning purposes only.

‡Fertilization and liming should be based on a soil test.

\*Includes 1.5 lb each of elemental Zn, Mn, Cu, & Fe from a sulfate source, 0.15 lb B & 5 lb S per acre.

\*\*2 times - to control weeds; weeds are mowed at 6-8" height back to 2" height.

AP-After planting.

Table 3. Establishment costs per acre (Tifton 85 Bermudagrass) - 2007.†

Concept	Unit	Quantity	Unit Price	Total
<b>A. Operating costs</b>				
<b>Soil preparation</b>				
Plowing	Passes	1.00	2.60	2.60
Disking	Passes	2.00	3.30	6.60
<b>Planting and fertilization ‡</b>				
Sprigging (includes seeding material, 30 bu/acre)	Acre	1.00	150.00	150.00
Nitrogen (7-10 days AP)	lb	30.00	0.40	12.00
Nitrogen (30 days AP)	lb	50.00	0.40	20.00
P2O5 (low - soil test) (7-10 days AP)	lb	25.00	0.33	8.25
K2O (low - soil test) (7-10 days AP)	lb	25.00	0.23	5.75
K2O (low - soil test) (30 days AP)	lb	25.00	0.23	5.75
Micronutrients*	lb	6.15	5.00	30.75
Lime (1 ton per acre/yr)	Ton	1.00	20.00	20.00
<b>Weed Control</b>				
Herbicide 7 days after sprigging	Gal	0.25	7.00	1.75
Labor	hr	2.00	8.50	17.00
Interest (operating cost)	\$	280.45	0.09	25.24
<b>Total operating costs</b>				<b>305.69</b>
<b>B. Ownership costs</b>				
Tractor-machinery	Acre	1.00	26.00	26.00
Land charge	Acre	1.00	25.00	25.00
Miscellaneous overhead (10% of total operating costs)	\$	305.69	10.00%	30.57
<b>Total ownership costs</b>				<b>81.57</b>
<b>C. Total costs (A + B) (T-85 Bermudagrass establishment/acre)</b>				<b>387.26</b>

†This budget is for planning purposes only.

‡Fertilization and liming should be based on a soil test.

\*Includes 1.5 lb each of elemental Zn, Mn, Cu, & Fe from a sulfate source, 0.15 lb B & 5 lb S per acre.

AP-After planting.

**Notes:**

## Notes: