

# Steps to Successfully Establishing Warm-Season Forages

Warm-season grasses can greatly complement cool-season grass pastures in a rotation and are highly palatable forages for livestock. There are approximately 1.73 million acres of warm-season forages produced in Mississippi. These systems include bermudagrass (769,599 acres), bahiagrass (903,157 acres), and summer annuals (59,312).

These grasses initiate growth in late April or early May and produce 65–75 percent of their growth from mid-June to mid-August. These warm-season grasses are highly palatable when harvested at the correct growth stage or when grazed rotationally. Over the years, many warm-season grasses have gotten the reputation that they are not as nutritious as cool-season grasses. In most cases, this reputation has come from poorer performance of cattle grazing in summer and from a misunderstanding of how to properly manage these grasses to reduce fiber content.

One of the drawbacks of warm-season grasses is that the cost of establishment often becomes a concern with high seed prices (Tables 1 and 2). If a producer is willing to undertake the obstacles of establishing and managing these types of grasses, the benefits can be tremendous. Many perennial summer grasses can produce an average of 2–3 tons of forage per acre. With intensive management, bermudagrass and bahiagrass can produce much more (Figure 1). On average, you can expect to support one cow per acre during the summer months when using the proper rotational grazing scheme.

Establishing a pasture or hay field is a key step in having a thick, lush, profitable stand. Following are several steps to successfully establishing warm-season forages.

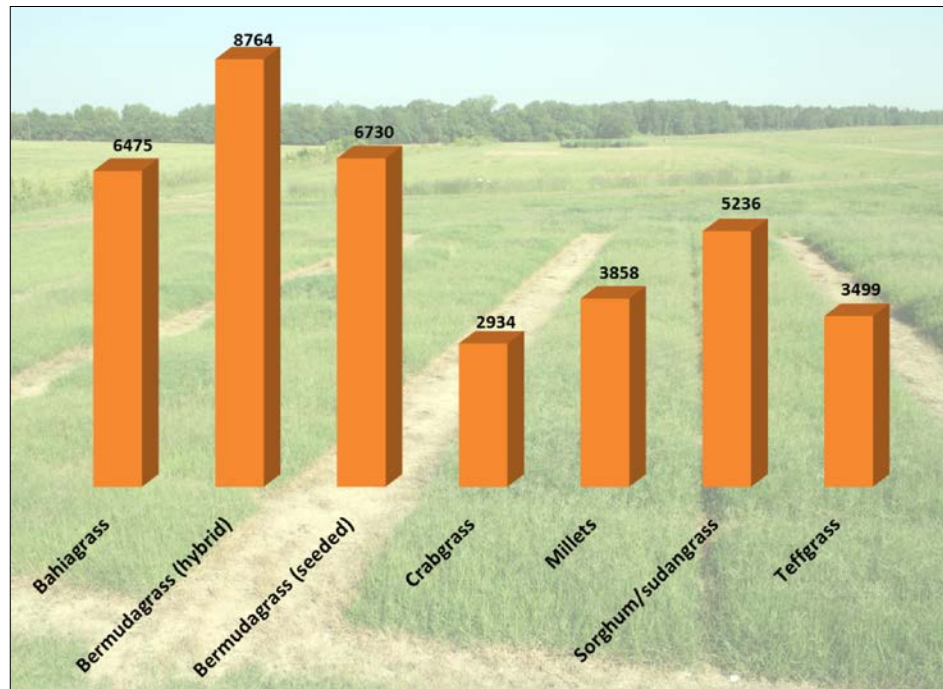


Figure 1. Average production of different warm-season grasses in Mississippi.



## Nutrient Management

An excellent stand begins with good soil preparation. The first step is to obtain an accurate soil sample and improve soil conditions accordingly. Do this 6 months before you plan to plant. Apply lime and fertilizer according to soil test recommendations. Lime should be applied 6 months before planting, while phosphorous and potassium can be applied at planting time. New pastures or hay fields will benefit from an application of nitrogen at 3–4 weeks after planting. In the case of sprigged hybrid bermudagrass, nitrogen should not be applied until 40 days after planting to help increase the number of runners and increase canopy cover. Successive applications of fertilizer will prolong the life and improve the performance of the new stand.

## Good Seedbed Prep

Most warm-season forages require a well-prepared and firm seedbed because some species tend to have poor germination. Planting depth is also an important component of successful establishment. Large-seeded forage crops such as sorghum can be planted deeper than small-seeded forages such as common bermudagrass or teffgrass. A nonselective herbicide to reduce competition might be necessary if you use a no-till drill. These species should be planted from late April to late June or from late August to early September (bahiagrass and bermudagrass only and when there is no late intended use of the pasture). Hybrid bermudagrass is not recommended to be sprigged past mid-August. Check with your local Extension office for the best seeding times in your area to ensure a successful planting.

## Species Selection and Seed Quality

Select species that are suitable for the desired yield and persistence based on soil, nutrients, environmental conditions, and intended use (**Tables 1 and 2**). After you have determined what forage species to plant, purchase a variety that will meet the needs of your intended use. It is important to buy high-quality seed—“bargain” or “cheap” seeds often are not high quality.

Pay attention to the germination percentage and purity of the seed. A quality warm-season seed has more than 70 percent germination and 90 percent purity. Certified seed must have this information on the seed label. If buying seed in bulk from your local co-op, always request this information. Sowing poor-quality seed may require re-seeding, which doubles the expense and could cause a loss in yield potential during the establishment year. It is also important to note that seeds might have a coating, which could account for up to 34 percent of the seed weight. It is important

to account for seed coating when calculating seeding rate. For example, let's say that teffgrass is recommended to be planted at 8 pounds per acre. The cost of raw/uncoated seed is \$3.84 per pound. The seed cost per acre will be \$30.72. If the seed contains 34 percent coating, the seeding rate increases to 11 pounds per acre. The coated seed cost is \$3.77 per pound. Now the seed cost per acre is \$41.47.

## Maintenance

Do not make the mistake of heavily grazing newly established summer forages under the hot and humid conditions in Mississippi. A newly seeded pasture should not be grazed until the plants reach at least 10–12 inches in height, and should be grazed no lower than 3 inches, to keep a vegetative stage of growth. They should be grazed only lightly between early July and late August. This newly seeded stand will not have a very well-developed root system, so it will be pulled out of the ground very easily by the livestock. A rotational grazing management approach should be used to avoid overgrazing and provide the proper rest to the stand. This keeps all the forage at the same uniform, palatable stage of growth, and helps to control many weeds by keeping them from flowering and producing seed. Hay should not be cut until plants have reached 15 inches in height, and nitrogen should be provided with each cut of hay.

After establishment, pH and fertilizer levels need to be maintained in the stand. Get a soil test every 2–3 years in pastures and every year in hay fields. Yearly soil testing in hay fields is recommended because large amounts of nutrients (especially potassium) are exported with each cut of hay and not replenished adequately. If the pastures do not contain 30–40 percent legumes, a yearly application of nitrogen fertilizer is necessary to maintain and feed the grasses. Applications of nitrogen at a rate of 60–80 pounds of actual nitrogen per acre per year are ideal. Apply this nitrogen in split applications of 30–40 pounds at green-up and in midsummer. Hay fields should receive phosphorous and potassium based on soil test recommendations, and 50 pounds of actual nitrogen per acre per cut of hay.

Warm-season perennial grasses establish relatively slowly, but once established and properly managed, the stand can last many years. An important management procedure is to give them a rest at the end of their grazing period and before the first frost. This helps build their root reserves as they go into winter. A prescribed burn, although not a requirement, is suggested every 3–4 years for some species to clean out biomass accumulation and promote new growth. These burns must be timed in the early spring when biomass residue is at about 1–2 inches.

**Table 1. Estimated average seed cost per acre for establishment of warm-season perennial forage crops\*.**

Forage species	Seeding rate (lb/ac)	Cost		
		\$/lb	\$/ac	
<b>Bahiagrass</b>				
Argentine	20	4.15	82.93	
Pensacola		3.42	68.40	
TifQuik		6.78	135.53	
Tifton 9		4.98	99.50	
UF-Riata		5.00	100.00	
<b>Bermudagrass, hybrid</b>				
Tifton 44	40 bu	-	110.00	
Tifton 85		-	110.00	
Sumrall 007		-	110.00	
Alicia		-	110.00	
<b>Bermudagrass, seeded</b>				
Cheyenne II	10	11.18	111.77	
Common (hulled)		6.75	67.50	
Common (unhulled)		5.42	54.17	
Cowboy		9.00	90.00	
Giant		9.43	94.33	
Laredo		8.00	80.00	
Mohawk		7.57	75.67	
Pasto Rico		6.37	63.70	
Ranchero Frio		9.28	92.80	
Sahara		4.70	47.00	
Sungrazer+		8.00	80.00	
Texas Tough		9.50	95.00	
Wrangler		6.38	63.80	
<b>Lespedeza</b>				
AU Grazer		30	7.20	216.00
Korean (hulled)	5.95		178.50	
Korean (unhulled)	2.96		88.80	
Sericea (hulled)	5.90		177.00	
Sericea (unhulled)	4.75		142.50	

\*Establishment cost does not include fertilizer, land preparation, herbicides, and labor. Prices may vary by region.

Note: The names and trademarks of the cultivars mentioned in this publication are **not endorsed** in any shape or form by the Mississippi State University Extension Service forage program. They are mentioned for educational purposes only. Producers should look at variety trials for their area to determine which varieties are best suited for forage production.

**Table 2. Estimated average seed cost per acre for establishment of warm-season annual forage crops.\***

Forage species	Seeding rate (lb/ac)	Cost		
		\$/lb	\$/ac	
<b>Crabgrass</b>				
Quick-N-Big	10	11.20	112.00	
Red River		11.20	112.00	
<b>Millet</b>				
Brown Top	30	1.00	30.00	
German Foxtail		1.04	31.20	
Japanese		1.08	32.40	
Pearl		1.16	34.80	
Proso		0.90	26.85	
<b>Sudangrass, sorghum/sudangrass</b>				
BMR sorghum sudan	30	1.08	32.40	
Milo or grain sorghum		0.44	13.20	
Piper sudangrass		1.04	31.20	
ProMax BMR Hybrid		1.72	51.60	
Sudangrass		1.12	33.60	
Red Top Forage Sorghum Hybrid		0.80	24.00	
Sorghum Sudan Hybrid (Spec. Effort)				
<b>Teffgrass</b>				
Tiffany Teff (coated)		10	3.77	37.67
Tiffany Teff (uncoated)			3.84	38.40

\*Establishment cost does not include fertilizer, land preparation, herbicides, and labor. Prices may vary by region.

Note: The names and trademarks of the cultivars mentioned in this publication are **not endorsed** in any shape or form by the Mississippi State University Extension Service forage program. They are mentioned for educational purposes only. Producers should look at variety trials for their area to determine which varieties are best suited for forage production.

**Table 3. Seedling vigor and tolerance of warm-season grasses to site characteristics and grazing pressure.**

Species	Seedling <sup>1</sup> vigor	Soil acidity	Poor drainage	Drought	Grazing pressure
<b>Annual</b>					
Crabgrass	G	G	P	F	E
Lespedeza	F	E	F	G	G
Pearl millet	E	E	P	E	F
Sorghum	G	P	P	E	F
Sorghum-sudan	E	P	F	G	F
<b>Perennial</b>					
Bahiagrass	P	E	G	E	E
Bermudagrass	F	E	P	E	E
Dallisgrass	P	F	E	G	G
Johnsongrass	G	F	E	G	P

<sup>1</sup>Seedling vigor is the potential for rapid uniform emergence and development of normal seedlings under a wide range of environmental conditions.

E = Excellent; G = Good; F = Fair; P = Poor

Source: Ball et al., 2002.

## References

- Ball, D.M., C.S. Hoveland, and G.D. Lacefield. 2002. Southern Forages: Modern Concepts for Forage Crop Management. 3<sup>rd</sup> ed. International Plant Nutrition Institute, Norcross, GA.

The information given here is for educational purposes only. References to commercial products, trade names, or suppliers are made with the understanding that no endorsement is implied and that no discrimination against other products or suppliers is intended.

*Copyright 2014 by Mississippi State University. All rights reserved. This publication may be copied and distributed without alteration for nonprofit educational purposes provided that credit is given to the Mississippi State University Extension Service.*

By **Rocky Lemus**, Associate Professor and Extension Forage Specialist, Plant & Soil Sciences.

Discrimination based upon race, color, religion, sex, national origin, age, disability, or veteran's status is a violation of federal and state law and MSU policy and will not be tolerated. Discrimination based upon sexual orientation or group affiliation is a violation of MSU policy and will not be tolerated.

**Publication 2838**

Extension Service of Mississippi State University, cooperating with U.S. Department of Agriculture. Published in furtherance of Acts of Congress, May 8 and June 30, 1914. GARY B. JACKSON, Director

(POD-05-14)



**MISSISSIPPI STATE  
UNIVERSITY**

**EXTENSION SERVICE**

**msu**cares.com