WARM SEASON FORAGE OPTIONS

AFGC - Forage Leader

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Cool season perennial grasses form the foundation of many forage production systems. These species (e.g., tall fescue, orchardgrass, etc.) produce substantial amounts of high-quality forage when temperatures stay between 60 - 80° F (Figure 1). Unfortunately, as the temperatures in the summer months exceed 80° F, these species produce less and less forage. The challenge for many producers is to find forage to fill this "summer gap" in production.

Fortunately, there are several warm season forage grasses that can be used to fill that void. Table 1 lists the major warm season grasses that are commonly used to fill the summer gap and make a well-rounded forage system. As with most issues, each of these species has positive and negative attributes. Many of these attributes are summarized in Table 1.

In deciding to use a warm season forage, one must first determine if the need is temporary or more chronic (i.e., there is a need each year). For filling the short-term gaps in forage production, annual forage species will be more productive and cost effective. For example, some annuals (pearl millet and sorghum x sudangrass hybrids) are quick to establish and quite productive under mild to moderate drought conditions. Warm season annuals are also helpful as a smother crop in renovating pastures or hayfields and some make excellent summer cover crops when temporary erosion control measures are needed.

Unfortunately, the annuals are more prone to accumulating toxic levels of nitrates in the forage during drought conditions. Members of the sorghum family (Johnsongrass, sorghum, sudangrass, and sorghum x sudangrass hybrids) can also produce toxic levels of prussic acid in severe droughts or following frost damage.

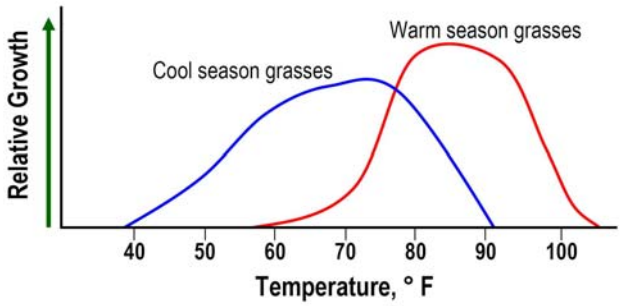

Figure 1. The relative effect of temperature on the growth of cool and warm season grasses.

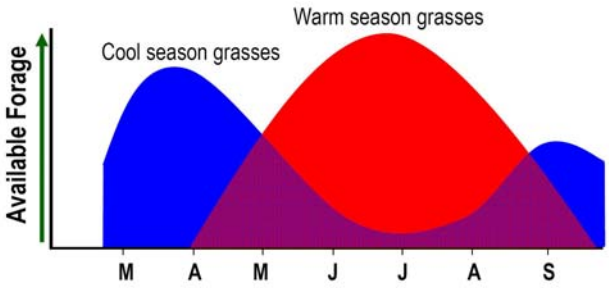

Figure 1. Cool season grasses have a "summer gap" in production. Warm season grasses can be used to fill this void.

If a more permanent solution is needed, the perennial warm season species are more cost effective over the long run. Unfortunately, the warm season perennials are typically more expensive to get established. Hybrid bermudagrasses, for example, must be vegetatively propagated from sprigs (underground plant parts) or tops of the plant. When sprigging equipment is unavailable, the establishment of the hybrid bermudagrasses can be labor intensive and very risky. Newer seeded bermudagrasses are available that can reduce the establishment cost, but these varieties typically are not as high yielding or as high in digestibility as the improved hybrid varieties. Furthermore, both types of

Table 1. Key characteristics of common warm season forage grasses.

		Quality‡		Cost of§		Ease of Use For¶	
Forage	Yield†	CP	TDN	Establishment	Production	Grazing	Hay
Annuals	(tons/a)	(%)	(%)				
Browntop Millet	1 - 3	9 - 12	50 - 56	V. Low	Low	3	2
Crabgrass	2 - 5	9 - 12	58 - 65	Low	Medium	1	3
Forage Sorghum	4 - 8	9 - 12	52 - 60	Medium	V. High	4	4
Pearl Millet	4 - 6	8 - 12	52 - 58	Medium	High	2	4
Sorghum x Sudan	4 - 10	9 - 12	53 - 60	Medium	V. High	3	4
Sudangrass	3 - 5	9 - 12	52 - 58	Medium	V. High	3	2
Teff	1 - 3	12 - 16	57 - 63	Low	Low	3	1
Perennials							
Bahiagrass	3-5	9 - 11	50-56	High	Medium	1	1
Bermudagrass (hybrid)	5 - 8	10 - 14	55 - 60	V. High	V. High	1	1
Bermudagrass (seeded)	3 - 5	8 - 12	52 - 56	High	V. High	1	1
Big Bluestem*	3 - 4	12 - 14	58 - 64	High	V. Low	2	2
Dallisgrass	2-5	10 - 14	57 - 63	High	low	2	2
Eastern Gamagrass*	4 - 6	10 - 12	58 - 64	High	V. Low	2	3
Johnsongrass	2-5	10-14	55-60	Medium	High	3	2
Switchgrass*	4 - 8	8 - 10	55 - 60	High	V. Low	3	3

† Typical range in yields of recommended varieties, but highly dependent on growing season and conditions.
‡ Assumes harvest or grazing occurs at late vegetative – early reproductive stages of growth.
§ Based on 2008 seed, fertilizer, and fuel costs and assuming moderate soil fertility.
¶ Ratings are 1 – 4: 1 = relatively easy and 4 = quite difficult or requires high level of management.
* Species native to North America.

bermudagrass can take a full growing season to become well-established. The native warm season grasses are generally even slower at developing a solid stand, and often take two to three growing seasons to truly become well-established. In the long-run, native grasses are much less expensive to maintain and are more resilient under drought. However, they require more intensive grazing management, strict adherence to grazing/cutting height requirements, and attention to the effect of hay harvest timing on forage quality.

This leads to the second definitive issue: what is to be done with the forage? Not all of these warm season grasses are easy to work with in a typical forage production system. Some of these species (especially the annuals) often grow erratically, mature too quickly, or are extremely sensitive to overgrazing. This can make some of these species very difficult to manage as a grazing crop and result in unacceptable levels of waste or stand failures. Hay production may also be impractical. Some of these warm season forages produce coarse leaves and stems that are nigh impossible to get dried down for haying. In such cases, baleage or some other haylage technique may be the only feasible harvest option. Regardless, it is critically important to understand how the forage is best used before settling on a particular forage option.

Attention should also be paid to planting date guidelines. Though there is some variation in the sensitivity of these species to planting date, it is important to establish warm season forages within the recommended range of planting dates for the given region. When dealing with the perennial species, this is critical for allowing enough time for the plants to become well-established before they go dormant in the fall. For annuals, late planting dates often result in low yields and plants that mature too quickly.

This brings up a final point, which is that it is important to understand the timing and distribution of the forage production. For example, pearl millet and members of the sorghum family (with some exceptions) produce most of their forage within the first 45-60 days of planting and are less productive for the remainder of their 120-150 day growing season. As a result, staggered planting dates may help to smooth the distribution of these forages, particularly when grazed. In contrast, teff is sometimes slow to grow early in the growing season but becomes more productive in later cuttings. Though the warm season perennials generally have a peak in production during the hottest days in the summer, they tend to have a wider and more normal distribution throughout the growing season.

In summary, warm season forages can provide high yields of high quality forage during the hottest months of the year when the cool season grasses are providing little (if any) forage. However, care should be taken to fully understand the positive and negative attributes of the warm season forage options. Understanding the role that these warm season forages can play in creating a well-rounded forage program can help even out forage availability without breaking the bank.