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Warm-Season Annual Forage Grasses for Texas

Vanessa A. Corriher
Assistant Professor, Forage Extension Specialist

Planting summer annual grasses can help you overcome summer forage shortages. These grasses can be very useful because they grow rapidly, tolerate drought, respond well to fertilizer and water, and are more nutritious than perennial warm season forages.

They are, however, not a permanent solution for meeting summer forage needs. They can be expensive to produce, are difficult to manage, and could poison livestock with nitrates and/or prussic acid. Despite these inherent drawbacks, summer annuals can be an excellent option in dry years.

Summer annual grasses that can be grown in Texas include:

- Pearl millet (*Pennisetum americanum*)
- Forage sorghum (*Sorghum bicolor*)
- Sorghum sudangrass hybrids
- Sudangrass (*Sorghum bicolor*)
- Crabgrass (*Digitaria sanuinalis*)

These forages can be valuable in an overall forage system. Each of these grasses has unique growth characteristics and must be managed appropriately for optimum production.

Pearl millet is adapted to sandy, acidic soils. It can be planted in the spring by broadcasting or by drilling seed ½ to 1 inch deep into a prepared seedbed. The shorter varieties such as Tifleaf I, II, and III are leafier and have fewer stems. Under grazing, these shorter grasses can be easier to manage than the taller types.

The taller varieties may produce more dry matter per acre than the dwarf types. Avoid grazing or mowing pearl millet too short, as that can kill the stand. If you leave 4 to 6 inches of plant stubble after harvest, pearl millet will regrow. The stand can be harvested again in about 4 to 6 weeks.

You can graze livestock on Tifleaf cultivars until frost because pearl millet does not contain harmful levels of prussic acid. However, it can cause nitrate poisoning.

Grain sorghums grow 3 to 5 feet tall and are not normally considered for forage because they yield relatively little dry matter. However, several types of forage sorghum have been developed.

Forage sorghums can grow 8 to 13 feet tall and produce a substantial amount of dry matter. Forage sorghums grow best in fertile, well-drained soils that have good water-holding capacity. It is the most drought tolerant of the warm-season annuals listed here. Forage sorghums are best used in a single hay cutting when plants are in bloom or early dough stage. These sorghums have large stems; crushing them with a mower/conditioner will make them dry faster.

Sorghum-sudan hybrids grow 4 to 7 feet tall, have smaller stems, and dry faster than the forage sorghums. Sorghum-sudan hybrids can yield more than any other summer annuals. These hybrids can be used for grazing or silage, but they are difficult to dry for hay.

If used for grazing, allow sorghum-sudans to regrow to 24 inches tall before reintroducing livestock. Do not allow horses to graze sorghum-sudans because they contain an unidentified toxin that can cause spinal cord degeneration and even paralysis.

Some sorghum-sudan hybrids and forage sorghum cultivars are sensitive to daylight duration. These photosensitive varieties can sustain more consistent growth over a longer growing season because they remain vegetative into September—until day length is less than 12 hours.

Sudangrass is a fast-growing warm-season annual that can produce good forage, though usually not as much as the sorghum-sudangrass hybrids. True sudangrass has fine stems and regrows rapidly after being grazed. Sudangrass needs fertile soil that drains well. Two plantings 4 to 6 weeks apart will provide forage throughout the summer.

Brown midrib varieties are preferable because they have less lignin and are more digestible than other varieties. In general, sorghums have total digestible nutrients values from 53 to 60 percent and crude protein concentrations of 9 to 15 percent.

Silage or hay is easiest to cure when the plants are in the boot stage (have not produced a seed head); however, yield and the sugar content that ferments silage rapidly are greater at the soft dough stage (when the seed is soft). Use a conditioner to crush the stems to ensure that the hay dries quickly.

Crabgrass is commonly considered a weed, but it can be a high-quality summer forage. Crabgrass grows best in well-drained soils and, if allowed to reach seed stage, can reseed itself year after year. Crabgrass forage has excellent quality and palatability, but the yield varies according to soil fertility and rainfall.

Crabgrass hay normally cures more slowly than bermudagrass but more quickly than sorghum-sudan hybrids or pearl millet. It is best to use this forage in a rotational grazing system.

Stand management

Summer annuals need appropriate fertilizers to produce well. Add lime, phosphorus, and potassium according to soil test recommendations. Nitrogen is also

important; apply at 60 to 100 pounds per acre at green up. If you plan additional harvests, you may apply 40 to 60 pounds of nitrogen per acre after each harvest.

Warm-season annuals require that you prepare the soil, plant seed, and fertilize each year. Given the price of diesel, seed, fertilizer, and irrigation, it might not be economical to plant and manage annuals. If there is not enough rain during the summer to produce sufficient hay, winter annuals may be an option.

Table 1: Planting dates and seeding rates for selected warm season annual grasses.

Species	Planting dates	Seeding rate	
		Drilled	Broadcast
		Lbs PLS*/acre	
Pearl millet	April 1–June 1	10–15	25–30
Sorghum x sudan hybrids	April 1–June 1	15–20	20–25
Sudangrass	April 1–June 1	20–25	30–40
Forage sorghum	April 15–June 1	15–20	20–25
Crabgrass	April 1–June 1	2–3	3–5

*Pure live seed

Warm-season annual forages work well in open land situations when you want to plant winter annual forages for grazing. The growing periods for cool- and warm-season annuals are complementary and allow for slight overlap in seasonal production.

Cautions

Both millet and sorghum-sudan plants can accumulate nitrates during drought. When conditions are dry, test the grass before allowing livestock to graze.

Millet and sorghum-sudan plants can be harvested as green chop, silage, or hay; nitrates will persist in forages cut for hay. As with grazing, you must test green chop to prevent prussic acid and/or nitrate poisoning.

If you suspect that hay has high nitrate levels, have samples tested. The local county Extension office can provide instructions on how to sample hay. Extension agents can also offer advice on the best ways to use hay with high nitrate levels.

For more information

These publications are available at the Texas A&M AgriLife bookstore (http://agrilifebookstore.tamu.edu):

B-6250, *Eastern Texas Forage Calendar*

E-543, *Nitrates and Prussic Acid in Forages*

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