

# SUMMER GRAZING OPTIONS

*S. Ray Smith*

Extension Forage Specialist

*Krista Lea, M.S.*

Research Technician

University of Kentucky

Lexington, KY

During the last 15 years there have been several new forage species that have emerged as useful in grazing systems and many new varieties have been released of traditional species. There are many sources of information on summer grazing options. We especially encourage you to read the publication written by Dr. Garry Lacefield and colleagues, "Extending Grazing and Reducing Stored Feed Needs" (AGR-199, [www.uky.edu/Ag/Forage/agr199.pdf](http://www.uky.edu/Ag/Forage/agr199.pdf)). I have used information from this publication and other publications from the University of Kentucky Forage Website ([www.uky.edu/Ag/Forage](http://www.uky.edu/Ag/Forage)) in writing this article.

There are a number of states that maintain forage variety testing programs. For example, the University of Kentucky tests approximately twenty forage species on an annual basis and these data reports can be downloaded from ([www.uky.edu/Ag/Forage/ForageVarietyTrials2.htm](http://www.uky.edu/Ag/Forage/ForageVarietyTrials2.htm)). The University of Kentucky variety testing program also evaluates stand survival under grazing. These "Grazing Tolerance Reports" are helpful to producers whose primary goal is pasture survival. We have included a link on the University of Kentucky Forage Website for reports from the variety testing programs in other states (<http://www.uky.edu/Ag/Forage/VarietyTrialsOtherStates.htm>).

## **SUMMER ANNUALS**

While corn is a warm-season annual grass, most of us first think of warm-season annual grasses such as sudangrass, sorghum-sudangrass hybrids, and pearl millet. These grasses have been used for many years to complement cool-season perennial forages and offer the advantage of producing a lot of forage quickly. One of the main limitations to these summer annuals is that grazing management can be challenging. First of all, these upright-growing forages should be planted separately from cool-season perennials to prevent excessive shading. They regrow slowly if grazed closer than 8 inches and should be rested between grazings. They perform best when planted on a prepared seedbed, although establishment costs are higher and the potential for soil erosion is greater when using this approach.

**Millets** are small-seeded, fast-growing summer annual grasses. They have smaller stems and are more leafy than the sorghum-type plants. Although they are lower yielding and somewhat slower growing, they do not have a problem with prussic

acid poisoning. There are several types: pearl, foxtail, Japanese, proso, and brown top. Only pearl millet is suited for grazing. Pearl Millet is higher yielding than foxtail millet and regrows after harvest if a 5-inch stubble height is left. Dwarf varieties, which are leafier and better suited for grazing, are available.

**Sorghum-sudangrass hybrids** are typically crosses between forage sorghums (female parent) and sudangrass types (male parent). They characteristically reach a height of six to eight feet, have smaller stalks than forage sorghum, strong tillering, and produce more tonnage than sudangrass. They have excellent re-growth potential compared to forage sorghums, but less than sudangrass. As with sudangrass, the excellent re-growth ability of sorghum-sudangrass hybrids makes them well suited for multiple grazings.

**Sudangrass** is smaller in plant architecture, has finer stalks, produces more leaves than forage sorghum and develops multiple tillers. Compared to forage or grain sorghums, sudangrass looks more like a “grass” plant. It possesses excellent re-growth ability with very quick recovery following cutting or grazing, compared to forage sorghum or sorghum-sudangrass hybrids. Total biomass tonnage for a single harvest generally will be less than yields of forage sorghum. Sudangrass is primarily utilized for grazing and hay production and can serve as an excellent cover-crop.

The Brown Midrib (BMR) characteristic reduces the lignin content of sorghum-sudan stalk and leaves, which translates into a higher percent digestibility and increased palatability, supporting more cattle weight gain and increased milk production. BMR types have 40% to 60% less lignin compared to conventional varieties.

Photoperiod sensitive (PS) sorghum-sudan grasses initiate flowering in response to day length. One of the most important factors affecting the flowering response in plants is light, and plants have differing photoperiod requirements for triggering their reproductive response (e.g. heading). Plants can be separated into three categories in response to photoperiod – short-day, long-day and day-neutral plants. Actually it is the light and dark period acting together that controls the response. The PS sorghums will not initiate heading until the day length becomes less than about 12.5 hours. Consequently, PS sorghum-sudan grasses will remain vegetative all season.

Drought-stressed summer annuals are the source of most of the forage-related cases of nitrate poisoning in Kentucky, but wheat, rye, soybeans, beets, Brassica spp. (rape, kale, turnips, swedes) and oats can also accumulate nitrates. Common weeds that are nitrate accumulators include ragweed, pigweed, thistle, bindweed, dock, jimsonweed, and johnsongrass. These lists are not complete, but these weeds and forages cause the most problems within the state.

For more information on these warm-season annuals, see the following resources:

- *2013 Summer Annual Grass Report*  
<http://www2.ca.uky.edu/agc/pubs/PR/PR670/PR670.pdf>

- *Producing Summer Annual Grasses for Emergency or Supplemental Forage* [\http://www.ca.uky.edu/agc/pubs/agr/agr88/agr88.pdf](http://www.ca.uky.edu/agc/pubs/agr/agr88/agr88.pdf).\
- *Forage-Related Disorders in Cattle: Nitrate Poisoning* [\http://www.uky.edu/Ag/Forage/Forage%20related%20disorders%20in%20cattle%20Nitrate.pdf](http://www.uky.edu/Ag/Forage/Forage%20related%20disorders%20in%20cattle%20Nitrate.pdf)

### **Grazing Corn**

We all know that corn is an important grain and silage in the U.S. and around the world, but it can also be grazed during late summer/fall or throughout the winter. In either case the corn crop is planted using standard equipment and management conditions. It can be grazed during the vegetative stage as an emergency late summer forage, or it can be left until maturity and grazed as standing corn during the winter. This may seem like a waste of a good corn crop, but the ears with mature grain provide a very high energy feed and make up half the weight of the crop and the leaf and upper part of the stalk are highly digestible forages that provide a good fiber balance to the grain. It is important to remember that cattle will waste much of a standing corn crop if they are turned into an entire field. To prevent excessive waste and livestock metabolic problems from eating too much grain, strip grazing with temporary fencing is essential. (*Grazing Corn: An Option for Extending the Grazing Season in Kentucky*, [\http://www.ca.uky.edu/agc/pubs/id/id152/id152.pdf](http://www.ca.uky.edu/agc/pubs/id/id152/id152.pdf))

### **Crabgrass**

Crabgrass is an annual high-quality forage that produces well on well-drained soils with a medium to coarse texture. It is easy to establish and can be managed for a planned volunteer stand that can last decades as a pasture or meadow without being reseeded, but it takes planning and management. It can form a sod whose quality nears that of bermudagrass and is certainly better than that of bunchgrasses. There are no known toxicity problems with crabgrass forage and there are several commercial varieties available.

Crabgrass pasture can be managed to have almost the same growing season as bermudagrass, but single-crop crabgrass usually greens about two weeks later in the spring. Its quality is better than that of bermudagrass. The high digestibility of crabgrass makes it excellent pasture or hay for cattle or horses. Crabgrass can be grazed off in the fall and sod-seeded to rye or annual ryegrass at least as easily as these species can be sod-seeded into bermudagrass. Crabgrass can be used successfully as a tilled double-cropping forage: crabgrass during summer, winter pasture during winter, and crabgrass again the next summer. To make crabgrass most successful, give it winter-season tillage, summer fertilization, and rotational grazing.

### **Chicory**

Forage chicory is a winter-dormant, herbaceous plant that has a rosette growth habit and a large taproot that allows for some tolerance to drought conditions. Forage chicory varieties, which tend to have much larger leaves, can be confused with wild chicory (also *Cichorium intybus* L.) and looks very similar to dandelion in the rosette growth stage. Spring growth of chicory consists of many leaves developing from the

crown of the plant, but as temperatures warm in early summer, flower stems develop and may grow as tall as 5 to 6 feet. The most common varieties of forage chicory available in Kentucky are Grasslands Puna, Brow Tyne, Six Point, and Oasis. Although originally developed in New Zealand, Grasslands Puna has performed well under Pennsylvania and Kentucky growing conditions. Several other varieties exist but are not available for use in the United States. Forage chicory can provide excellent spring and summer forage for grazing livestock in Kentucky. As with other forage species, nutritive quality declines as the plant matures and reaches the reproductive growth stage in late summer. (*Chicory: An Alternative Livestock Forage* <http://www.ca.uky.edu/agc/pubs/agr/agr190/agr190.pdf>.)

### **Bermudagrass**

Bermudagrass [*Cynodon dactylon* (L.) Pers] can be used successfully as part of a livestock forage program to supplement summer production of cool-season grasses. It is high-yielding, sod-forming, warm-season perennial grass that is most productive on well-drained, fertile soils. Bermudagrass is widely grown in the southern United States for pasture and hay. Like other warm-season plants, bermudagrass makes its best growth at 80-90° F. Growth is very slow when temperatures are below 60° F and also tends to decline above 95° F. In most years, bermudagrass growth starts in late April and continues rapidly until mid-September, when it is limited by cooling temperatures. Thus, bermudagrass is very productive during June, July, and August.

Wise use of cool-season perennial grasses and legumes in combination with bermudagrass can help extend the grazing season and reduce the demand on winter feed supplies. However, the potential for winterkill always exists for bermudagrass in Kentucky, so consider only the most winter-hardy varieties. In Kentucky, planting dates should be targeted for early May through mid-June if irrigation is not available. For more information, see publication AGR-48, Bermudagrass: A Summer Forage in Kentucky (<http://www.ca.uky.edu/agc/pubs/agr/agr48/agr48.pdf>)

## **NATIVE WARM-SEASON PERENNIAL GRASSES**

Native warm-season perennial grasses are well adapted for production in Kentucky's climate and soils. In contrast to cool-season grasses like tall fescue, orchardgrass, and Kentucky bluegrass, warm-season native grasses grow best in late spring and summer. They can be grazed during summer when cool-season grass pastures are less productive.

**Eastern gamagrass** is a bunchgrass that produces short, thick rhizomes near the soil surface. It is among the highest quality native warm-season grasses, with high palatability and digestibility and one of the longest growing seasons. Individual plants grow in size as the surface rhizomes spread outward forming large circular clumps over time, with the center often becoming open after a few years. Eastern gamagrass does best on deep, well-drained soils but can withstand short periods of flooding. Corn planters are usually used to seed eastern gamagrass in 30-inch or narrower rows.

Some farmers have even been successful seeding it with a corn crop. Eastern gamagrass is often the preferred native warm-season grass for pasture, but its high quality also produces excellent hay and baleage.

**Big bluestem** is a tall growing (6 to 8 feet) bunchgrass with generally higher forage quality than switchgrass. It also provides excellent wildlife habitat. Yield potential is generally less than switchgrass and eastern gamagrass; however, big bluestem is more drought tolerant and can be grown on poorer soils—especially those that are shallow and steep. Big bluestem produces most of its growth after June 1, a date that coincides with the decline in production of cool-season grasses. Its good forage quality and relative ease of drying make it the preferred native warm-season grass for hay production for beef cattle, horses and other livestock species or it can be used for grazing, especially in July and August.

**Switchgrass** is a tall growing (4 to 9 feet), wide-leaved grass that produces short rhizomes so that individual plants increase in size over time. The seed are similar in size to orchardgrass and are smooth; unlike other native warm-season grasses switchgrass seed flows easily through most drills. Switchgrass becomes thick stemmed as it matures, so it needs to be grazed at a vegetative stage (before seed heads emerge) for good quality forage. Upland varieties such as Cave-in-Rock and Blackwell are shorter and better adapted to well-drained (even droughty) soils on side slopes and ridge tops. Upland varieties are generally preferred for forage production, with their smaller stems and higher leaf to stem ratio. Lowland varieties such as Alamo and Kanlow are taller, have coarser stems, and do better on sites that may be flooded for short periods or are somewhat poorly drained. Switchgrass works well as a hay crop but can also be rotationally grazed.

**Indiangrass** is also a tall growing (5 to 7 feet) bunchgrass that develops thick stems if allowed to mature. It produces more of its growth later in the summer than the other native warm-season grasses, which makes it a good match for cool-season grasses. Indiangrass yield potential is comparable to that of big bluestem but less than switchgrass and eastern gamagrass. It is very drought tolerant and can be grown on steeper, shallower soils. Indiangrass makes a good hay crop but may be best used for summer grazing.

**Little bluestem** is less productive than the other native warm-season grasses. It can be harvested as hay or rotationally grazed, but its lower yield and quality make it best suited for conservation and wildlife habitat plantings. It is usually planted in mixtures with other grass species.

- *Native Warm-Season Perennial Grasses for Forage in Kentucky*  
(<http://www.uky.edu/Ag/Forage/AGR145.pdf>).

## **FORAGE LEGUMES**

**Alfalfa** can be ideal on farms where it can be used for hay, silage, or grazing. Virginia researchers studied grazing alfalfa systems based on need and environmental conditions. Systems of grazing the early spring growth provided quality feed and delayed the first hay harvest until more favorable weather conditions for curing. Other systems provide grazing during midsummer when cool-season grasses are often less productive. These studies show that total seasonal yield is not reduced by any graze-hay systems. With proper grazing management, alfalfa's high yield potential can be converted to high levels of animal production per acre.

Liveweight beef cattle gains per acre are quite high for alfalfa with total season gains of 500 to 800 pounds per acre in research trials and on-farm demonstrations. The Kentucky record is 1,354 pounds of beef per acre. In grazing trials and demonstrations, forage quality of alfalfa pasture is excellent, resulting in total season average daily gains of over 2 pounds per day. In addition, milk from dairy cows and gains of lambs are greater when these animals graze alfalfa compared to grass. The deep root system of alfalfa makes it more drought tolerant than cool-season legumes and grasses. Although alfalfa does not make maximum growth during summer droughts, it usually provides good summer pastures. During extreme drought, this aspect is even more important since cool-season grasses become dormant.

Additional Resources:

- *Grazing Alfalfa*, <http://www.ca.uky.edu/agc/pubs/id/id97/id97.pdf>
- *2013 Alfalfa Grazing Tolerance Report*, <http://www2.ca.uky.edu/agc/pubs/PR/PR666/PR666.pdf>

**Striate lespedeza and Korean lespedeza** are warm-season annual legumes that work well in some situations in the Upper South. Both species typically produce relatively low yields, but are adapted on dry, acid, upland sites where clovers do not persist well. Furthermore, they produce good quality forage during summer when the quality and quantity of cool-season perennials, such as tall fescue, is low. Therefore, annual lespedeza can greatly enhance a tall fescue pasture, especially if the fescue is highly infected with toxic endophyte. New annual lespedeza varieties have been developed in recent years, but there is limited forage yield data from controlled experiments.

### **Cowpeas**

Cowpea is known by many names including southern field pea, crowder pea, cream pea, zipper pea, purple hulls, pink eyes, and blackeyed pea. These common names refer to different market classes of the same sub-species and the lack of consistent common name recognition has impeded the development and adoption of new varieties. For example, forage types such as cv. mixture 'Iron & Clay' are typically spreading, small seeded, photo-sensitive, and late maturing with little resemblance to popular grain-types like blackeyes which are erect, large seeded, photo-insensitive, early maturing, and produce much less biomass.

Research has shown that forage cowpeas can produce greater amounts of high-quality forage dry matter than most other warm-season legumes especially under hot and dry conditions. In central Texas, Muir (2002) found that forage cowpeas (cv. mixture 'Iron & Clay') produced significantly greater total dry matter (DM) in the first year of a study than all other forage legumes evaluated including partridge pea, peanut, phasey bean, lablab, soybean and velvet bean. In the second year of the study, a severe drought year, only partridge pea produced greater DM than cowpeas, and both the soybean and velvet bean experienced complete crop failure. In the same study, cowpea forage harvested throughout the season had significantly greater crude protein than soybean. A second study in the same location confirmed that forage cowpeas (cv. mixture 'Iron & Clay') produced significantly greater dry matter and were significantly greater or equal in crude protein than forage soybeans (cv. 'Laredo') especially early in the season (Muir et al., 2008). Research in North Florida also found cowpea to have significantly higher crude protein and in vitro dry matter digestibility (IVTD) than forage soybeans (Foster et al., 2008). The other benefit of forage cowpeas for ruminants is that, unlike most clovers and alfalfa, forage cowpea has a high tannin content which reduces the risk of bloat.

Sorghum sudangrass monoculture is commonly planted as a warm-season forage in the Mid-South. However, it has higher neutral detergent fiber (NDF), lower relative feed value (RFV), and lower crude protein which reduces its grade as compared to other high quality forages. Incorporation of cowpea in a mixture with sorghum sudangrass can improve the overall forage quality and grade by increasing its protein content and reducing its NDF.

In conclusion, we have overviewed summer grazing options in this paper. For more details on these species, carefully read the publications we have identified in the text.