Native warm-season grasses: Selection of species and cultivars for forage production

Recent studies indicate that native grasses can be a useful "tool" for forage producers providing a good complement to tall fescue or orchardgrass and a low input alternative to bermudagrass. There are five species typically considered for forage production: switchgrass, big bluestem, little bluestem, indiangrass, and eastern gamagrass. While all have value for forage production, benefits and site adaptations vary by species. Below, I discuss each of these species and their more widely available cultivars.

Switchgrass —This may be the most familiar of the native grasses to producers because of the attention it has received as a potential bioenergy crop. Switchgrass is very productive, typically yielding more than 5 tons per acre. In a recent UT trial, single harvests of switchgrass yielded 3.5 and 5.5 tons per acre at early boot (late May) and early seed head (mid to late June) stages, respectively.

There are two basic types of switchgrass – upland and lowland. Lowland cultivars (*Alamo* and *Kanlow* are the two most common and are widely available) are taller and stemmier, yielding about 25 - 50% more than many upland cultivars. *Alamo* and *Kanlow* are very similar and the main distinction in terms of choosing which to plant is latitude. Growers from Kentucky north should consider the more cold-hardy *Kanlow*. Growers from Tennessee south will be better off with *Alamo*. Lowland cultivars, as their name implies, are adapted to very wet sites producing acceptable yields where other common production grasses will not survive.

There are many upland cultivars of switchgrass, but the highest yielding and best candidate for forage production is *Cave-in-Rock*. Like other upland switchgrasses, it has finer leaves and is less stemmy than lowland cultivars. Yields typically will be 10 – 20% lower than that produced by lowland cultivars.

In terms of forage quality, switchgrass can become stemmy, especially the lowland cultivars, but it is readily grazed by cattle and produces summer gains of 1.5 – 2.0 lb/day on steers. Carrying capacities (at 60 units nitrogen per acre) exceed 2000 lb per acre during May and June. Together, these attributes may make switchgrass the best option among the natives for overall forage production. Rates of gain are at a desirable level for backgrounding and heifer development, and the abundant growth allow for maintaining large numbers of cow-calf pairs during summer droughts. Indeed, switchgrass may be the most drought tolerant of the natives. Economic analyses conducted at UT indicate it provides the best returns and cheapest gains among native grasses.

Big bluestem — Among the natives, big bluestem is the most preferred by cattle. Yields are not as high as switchgrass with annual production (one to two cuts per year) at about 4 tons per acre. This species has fine, leafy foliage, especially *OZ-70* and *Rountree* cultivars. These two cultivars do well from Tennessee north with *Earl* (a Texas origin cultivar) being better adapted to conditions in the Deep South. There are a number of very desirable local ecotypes being produced by seed growers including *Mammoth*, *Karst*, and *Prairie*. *Kaw* is an Oklahoma origin cultivar that also does well in the eastern US.

Big bluestem produces excellent forage with steers gaining 2.0 – 2.5 lb/day throughout the summer. Carrying capacity for big bluestem is only about two-thirds of that produced by lowland switchgrass (1000 lb per acre during May and June). Big bluestem can grow on a wide variety of sites, but does not do as well on wet sites as switchgrass. It does best on moderately to well-drained sites. It grows well in blends with indiangrass and little bluestem and such blends can be managed compatibly for pasture or hay. For producers interested in heifer development or backgrounding steers, it is likely the best option because of the exceptional gains it can produce. It also would be the best choice for producing hay for the cash market.

Little bluestem —Little bluestem produces the less forage than the other species mentioned here. However, it has the advantage of doing well on particularly poor sites and, compared to other natives, is easily established. Therefore, it also can be a good complement in blends with big bluestem and indiangrass by filling gaps in the stand where soil is poorer or establishment was not as successful. The most widely available cultivar is *Aldous*, although there are a number of other options available including some desirable local ecotypes. On dry ridges or other sites with thin or degraded soil, a blend of little bluestem and indiangrass will be the best option for forage production.

Indiangrass — Compared to big bluestem, indiangrass is somewhat more productive (about 5 tons per acre annual production based on one to two cuts per year), its leaves are not as fine, and it is slightly stemmier. Indiangrass is an excellent forage, being only slightly less preferred by cattle than big bluestem. Like little bluestem, it is one of the easier natives to establish. The better known cultivars that do well in the eastern US are *Rumsey* and *Osage*. *Americus*, a new release based on southern genetics is well-adapted to the Deep South. Additionally, there are several relatively new local ecotypes on the market that may provide better adaptation based on their origin and include, *Boone* (KY origin), *Prairie* (IN origin), and *VA* (VA origin).

Typically, steers do about as well on this species as they do on big bluestem with gains exceeding 2 lb per day. Carrying capacity is somewhat higher than that of big bluestem though, at about 1200 lb per acre at peak, early summer growth. Indiangrass is less tolerant of wet sites than big bluestem. It can grow on a wide variety of soils, being intermediate between big and little bluestem in terms of its tolerance of poor soils. Like big bluestem, it is an excellent choice for backgrounding steers or heifer development and grows well in blends with that species.

Eastern gamagrass —In terms of yield, carrying capacity, and drought tolerance, eastern gamagrass is comparable to switchgrass. However, it starts growing earlier in the spring and sustains production in late summer better than the others and, unlike the other natives, is very responsive to nitrogen. There are three relatively common cultivars: *Pete*, *Iuka*, and *Highlander*. The first two are similar and have finer leaves and lower yields (about 25% less) than *Highlander*. All three cultivars do well throughout the eastern US.

From a quality standpoint, studies at UT indicate gains (steer weight basis) of about 1.4 lb per day are reasonable. In terms of carrying capacity, a UT trial in which no nitrogen was applied supported stocking of more than 2000 lb per acre with *Highlander*. Like lowland switchgrass, eastern gamagrass can tolerate very wet sites. On the other hand, it is not as tolerant of poor sites as the other natives discussed here. Because of the modest rate of gain for this species, it would not be as desirable for stockers or heifer development as the other species. However, because of

its high carrying capacity, eastern gamagrass can be a very useful grass for providing forage during prolonged droughts. Producers with access to inexpensive forms of nitrogen (poultry litter, dairy effluent, municipal sludge), could experience considerably higher gains and carrying capacities given this species ability to respond to fertility.

Consideration of the site adaptations, available cultivars, and attributes of these species can allow producers to identify options among native grasses that may be best suited to their operation. Additional information is available at the UT Extension publications website by entering the term "native warm-season grass" into the search engine: https://utextension.tennessee.edu/publications or visit the website for the Center for Native Grasslands Management: http://nativegrasses.utk.edu/.

Patrick Keyser is the Director of the Center for Native Grasslands Management at the University of Tennessee, pkeyser@utk.edu. *This article was reprinted with permission from the Feb. 1, 2015 issue of the Progressive Forage Grower.*