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warm-season grasses for july and august



Switchgrass • Indiangrass • Big
bluestem • Little bluestem • Sideoats
grama • Blue grama • Buffalograss

Cooperative Extension Service
South Dakota State University
U. S. Department of Agriculture

Warm-Season Grasses for July and August

The low production of pasture grasses, long a problem in South Dakota, is most critical during the mid-summer months of July and August. These are the months when Kentucky bluegrass, smooth brome grass, and cool-season native grasses become somewhat dormant and production is greatly reduced.

The problem has at least two solutions: (1) use a lighter stocking rate all season long, or (2) put part of the herd on mid-summer or supplementary pasture.

Perennial grasses that provide maximum forage production for mid-summer pasture in July and August will be discussed in this Fact Sheet. Cool-season grasses are discussed in three other publications: "Cool-season Grasses for Early Spring and Fall," "Cool-season Grasses for May and June," and "Grasses for Special Purposes."

With a relatively light stocking rate on cool-season pasture, livestock do not use the forage as fast as it is produced during cool weather (May, June, and September), but may use it faster than it is produced during warm weather (July and August). This type of management allows the use of one pasture for an entire season, but is not always the most efficient type of management. A second type of management includes a heavier stocking rate that uses forage from cool-season grasses as fast as it is produced during cool weather and includes the use of a mid-summer pasture during warm weather.

Smooth brome grass-alfalfa pastures and intermediate wheatgrass-alfalfa pastures at Brookings were capable of supporting 1 animal unit per acre (AU/A) for 4.5 months and provided 4.5 animal unit months per acre (AUM/A) of grazing. Some forage produced in May and June was not used until later. With management that used the forage as fast as it was produced, these pastures were capable of supporting 2 AU/A from mid-May to mid-July and again in September, but only $\frac{1}{2}$ AU/A during late July

and August. They provided about 5.5 AUM/A of grazing. By grazing grass as it grew, it was possible to increase stocking rate by 1 AUM/A.

At the Pasture Research Center in Faulk County, pastures of smooth brome grass, intermediate wheatgrass, and pasture-type alfalfa were capable of supporting $\frac{2}{3}$ AU/A for 4-5 months and provided 3 AUM/A of grazing. Similar pastures were capable of supporting 2 AU/A from mid-May to July (45 days) and again in September (15 days). The cattle were pastured on warm-season perennial grasses (40 days) in July and August. This type

of management provided 4.5 AUM/A. By using a combination of cool-season and warm-season grasses, the stocking rate was increased by 50%.

At Lincoln, Neb., 189 days of grazing on cool-season grasses produced 193 pounds of gain per steer while 104 days (56 days in the spring and 48 in the fall) on cool-season grasses and 85 on warm-season produced 267 pounds. The 74-pound greater gain was obtained by using warm-season grasses in mid-summer.

At Lincoln, steers were grazed for 105 days between mid-June and September over a 5-year period. Average

Switchgrass.
Plant X 1/2;
seeds X 10.



By Lyle A. Derscheid, agronomist, Cooperative Extension Service; James G. Ross, professor, and C. R. Krueger, assistant professor, Plant Science Department, Agricultural Experiment Station; and C. M. Schumacher, range conservationist, Soil Conservation Service.

production was 160 to 180 pounds of beef per acre on late-maturing switchgrass, Indiangrass, and big bluestem.

In another Nebraska test three warm-season grasses were compared with three cool-season tame grasses. The pounds of beef per acre for the six grasses were: 175 on intermediate wheatgrass, 170 on smooth brome-grass, 155 on tall wheatgrass, 160 on big bluestem, 140 on switchgrass, and 130 on sideoats grama.

All of the warm-season grasses in South Dakota are native grasses. They all start growth in late May, are ready for grazing around July 1 and mature during late August. Plant breeders have collected individual plants of several species and used these to develop varieties.

Switchgrass

Switchgrass, *Panicum virgatum* L., is a tall, sod-forming, warm-season, perennial grass with short rhizomes. It has coarse stems, broad leaves, and grows from 3 to 5 feet in height. The flowering head is a widely branching open panicle. The leaves are usually from $\frac{1}{4}$ to $\frac{1}{2}$ inch wide and 6 to 18 inches long. Leaves are green to bluish-green. Switchgrass is native to flood plains throughout the state and occurs on nearly all soil types, but is most abundant and thrives best in moist low areas of relatively high fertility. It spreads slowly by short rhizomes. The stand looks like a colony rather than a sod.

Switchgrass is recommended for use as a mid-season (supplemental)

pasture from mid-July to September when cool-season grasses are less productive. Start grazing 5 to 6 weeks after growth begins (first plants are starting to head) and graze continuously. Recovery after grazing or mowing is minimal. Early grazing of switchgrass removes the growing point and lowers production.

Switchgrass starts growth about June 1 and makes its maximum growth during the warm part of the summer when cool-season grasses are dormant. At Brookings, switchgrass produced over 3 tons per acre of forage by July 8 (40 days after growth started). Its palatability is not as high as that of smooth brome-grass or intermediate wheatgrass, but is acceptable to livestock especially when grazed in pure stands.

Indiangrass.
Plant X $\frac{1}{2}$; plant
parts X 5.

Big bluestem.
Plant X $\frac{1}{2}$;
seed X 5.



It is widely used for summer pasture and erosion control. Hay can be made, however, it is generally too coarse for good quality. Its value for standing winter feed is poor. Switchgrass occurs naturally on fertile soils well supplied with moisture, but will produce better growth and cover on droughty, infertile, eroded soils than most introduced grasses. Seed matures in September.

Summer, developed in South Dakota from selections obtained in southeastern Nebraska, is one variety recommended for use in South Dakota. Average yields are 2.4 tons of forage per acre at Brookings, 2.9 tons at Norbeck, and 500 pounds of seed per acre at Centerville. With the use of fertilizer, forage yields were 5.1 tons at Brookings and 3.8 tons at Norbeck. Nebraska 28, developed in Nebraska from selections obtained in northern Nebraska, produced 1.7 tons of forage at Brookings. Although Summer produces more forage at Brookings and provides forage for a longer season, Nebraska 28 had better seedling vigor at Norbeck and may be better adapted to northern areas of the state.

Yellow Indiangrass

Indiangrass, *Sorghastrum nutans* (L.) Nash, is a tall, sod-forming, warm-season perennial. Plants grow to a height of 2 to 5 feet, leaves are rough, long, 3/16 to 1/8 inch wide, and covered with a bloom. The sheath is smooth and the seedhead is a panicle 4 to 12 inches long that contracts and darkens with age from yellowish- to reddish-brown.

Indiangrass is a high-yielding grass having good nutritional and palatable qualities. Its growth habits and uses are similar to those of switchgrass.

It is a good crop for hay, mid-summer pasture and is effective for preventing soil erosion.

Holt is a strain developed from selections obtained in Holt County, northern Nebraska. It should be adapted to eastern South Dakota and favorable moisture sites in western areas, but has not been fully evaluated. Seed from native stands less than 200 miles north or 300 miles south of the area to be seeded is recommended.

THE BLUESTEMS

Stems of *Andropogon* species are solid or pithy, differing in this respect from those of most other grasses, which are hollow. Two spikelets are produced at each node of the rachis.

One spikelet is sessile and produces seed; the other is stalked and sterile.

Several species are regarded as good forage grasses because of their wide natural occurrence and dependability. Big and little bluestem are perhaps the most prevalent constituents of the wild hay of the Prairie States. They are valued highly for grazing, although they become less palatable as they mature.

Big Bluestem

Big bluestem, *Andropogon gerardi* Vitman, is a tall, sod-forming, warm-season perennial grass that has short underground stems. Plants usually grow 6 feet tall under favorable conditions of soil and moisture. Although short rhizomes are present, it usually makes a bunch type of growth. Leaf blades are about 12 inches long and

1/4 to about 1/2 inch wide. The leaves may be hairy near the base, and the sheaths are usually hairy. The flowering stalks are stout, coarse, and solid. The extensive root system penetrates deeply. It is native to eastern South Dakota and grows well on most soil types, but is most abundant on moist, well-drained loams of relatively high fertility.

It is recommended for use in mid-summer (supplemental) pastures much the same as switchgrass. Palatability is seldom a problem with big bluestem. It also may be grazed in late fall after plants mature.

Growth begins with warm weather in early June and continues until fall.

It is the dominant species in eastern South Dakota in well-managed native pastures and provides abundant, palatable, nutritious forage for all classes



Little bluestem.
Plant X 1/2;
seed X 5.

of livestock during summer months. It is vigorous and will recover from close grazing if allowed to make adequate growth before being grazed. Good pasture management is required to prevent stands from being depleted.

It makes good quality hay if mowed before it becomes stemmy and seed heads form. Much of the native hay marketed in South Dakota consists of big bluestem and associated species.

Pawnee is a variety developed from selections obtained in Pawnee County, southern Nebraska. Champ is a composite developed from four strains obtained on sandy soils in Cherry and Holt counties of northern Nebraska, Ames, Iowa, and Pawnee County, Nebraska. Pawnee should be adapted to the southeastern quarter of South Dakota; whereas Champ may be more widely adapted. Seed from native stands less than 200 miles north or 300 miles south of the area to be seeded is recommended.

Little Bluestem

Little bluestem, *Andropogon scoparius* Michx., is an erect, mid-tall warm-season perennial bunchgrass. Plants usually grow 1 to 3 feet tall. The leaf blades are less than $\frac{1}{4}$ inch wide and 4 to 8 inches long. The leaves, flattened at the base, are light green until the plants reach maturity, when they develop a distinctive reddish-brown color. Seed matures in September and October.

Little bluestem is less productive than switchgrass, Indiangrass, or big bluestem. Therefore, it is recommended only for use in a mixture of warm-season grasses for erosion control on low fertility sites, and possibly for mid-summer pasture.

It produces a fair yield of nutritious, palatable forage when grazed at early stages of growth. However, it becomes unpalatable as it nears maturity. If kept too closely grazed it will be replaced by less productive grasses. After frost the reddish-brown color of little bluestem makes it conspicuous on the steep slopes where it still occurs.

Little bluestem is native to silty and coarser textured upland soils throughout South Dakota. Its habit of growth and adaptability to a wide range of soils make it valuable for erosion control.

Little bluestem is smaller than big bluestem. The two usually are found in close association, but little bluestem is more drought-resistant and therefore is better adapted to sites that receive limited moisture.

THE GRAMA GRASSES

All species of *Bouteloua* are native to the Western Hemisphere.

The gramas are summer growers, and the amount of forage they produce depends upon the moisture available during the growing season. In years of extreme drought they make little or no new top growth. Most species cure naturally, however, and standing growth from previous seasons makes very satisfactory and palatable forage for most classes of livestock.

Sideoats Grama

Sideoats grama, *Bouteloua curtipendula* (Michx.) Torr., is a native warm-season bunchgrass with short rhizomes that sometimes spread to form a sod. The flowering stalks are 2 to 3 feet tall. The leaves are about 6 inches long and nearly $\frac{1}{4}$ inch wide. The seed head consists of a large number of spikes set on a slender, zigzag rachis about 6 to 8 inches long. The stalks of the spikes are twisted, so that the spikes all extend, like a banner, on one side of the central axis. The root system is fairly deep and well branched; thus plants can effectively use all available moisture.

Sideoats grama is recommended for use in the same way as little bluestem.

It is found in favorable sites in central and western South Dakota. In drier areas it is replaced by blue grama. It rarely forms pure stands. It usually grows in association with bluestems or with needlegrass or western wheatgrass in a mixed prairie. It is palatable to all classes of livestock, having about the same forage value as the bluestems. Forage yields are

Sideoats grama.
Plant X $\frac{1}{2}$;
seed X 5.



Blue grama. Plant X $\frac{1}{2}$; seed X 5.

greater than for blue grama, slightly less than little bluestem, and much less than big bluestem or switchgrass. Its main use is in a mixture of warm-season grasses for grazing in July and August in the western two-thirds of the state.

Butte and Pierre are the varieties recommended for use in South Dakota. Butte was developed in Nebraska, and Pierre was developed in North Dakota from seeds collected from vigorous native plants growing 5 miles west of Pierre, S. D. Seed from native stands less than 200 miles north or less than 300 miles south of the site to be seeded may be used.

Blue Grama

Blue grama, *Bouteloua gracilis* (H. B.K.) Lag. ex Steud., is a short, sod-forming, native warm-season, perennial grass that spreads by means of short rhizomes. The leaves are 3 to 6 inches long and less than 1/8 inch wide. The flowering stems are 12 to 18 inches tall. Each stem usually has two purplish spikes that extend at a sharp angle from the main stem.

Blue grama is found on all soil types, including alkaline soils, but is most abundant on the heavier rolling upland soils. Its capacity to resist drought permits it to occupy the drier sites throughout its range of adaptation.

Growth begins fairly late in the spring depending on how much moisture is available. The seed matures in August. The forage is relished by all classes of livestock. Growth ceases during long droughts, but begins again upon the return of favorable moisture and temperature. Because of its high quality, hardiness, and growth habits it is one of the most important range species in the western two-thirds of the state.

Under heavy grazing, blue grama often persists in nearly pure stands after the associated grasses disappear. It is palatable and nutritious, but does not produce enough forage to make it useful to plant in a pasture or hay mixture.

Buffalograss

Buffalograss, *Buchloe dactyloides* (Nutt.) Engelm., is a fine-leaved native, sod-forming perennial. It is the dominant species on large areas of upland in the short-grass region of western South Dakota. Generally it grows 4 to 6 inches high and produces leaves less than 1/8 inch wide and 3 to 6 in-

ches long. It spreads rapidly by surface runners and forms a dense, matted turf. During the growing season the foliage is grayish-green, which turns to a light straw color when the plants cease growth.

Buffalograss grows in association with blue grama. Growth begins in late spring and continues through the summer. Livestock like its forage. Its palatability, prevalence, and adaptation to a wide range of soil and climatic conditions make it an important forage species of western South Dakota.

It withstands long, heavy grazing better than other grasses native to that region. On ranges consistently subject-

ed to severe use, it often survives as a nearly pure stand.

Though it is palatable and highly nutritious, it does not produce enough forage or TDN per acre to make it worthwhile to plant in a pasture or hay mixture.

ACKNOWLEDGMENT

The authors have drawn freely from the USDA Yearbook "Grasses" and the SCS Agriculture Handbook No. 339 "Grasses and Legumes for Soil Conservation in the Pacific Northwest and Great Basin States." The line drawings were taken from SCS Agriculture Handbook 339 and SCS-TP-151, "Key to Perennial Grasses." All production data, however, were obtained in South Dakota, except where otherwise specified.

Buffalograss.
Plant X 1/2.
plant parts X 5.



Fact Sheets for Additional Information —

Cool-Season Grasses for Early Spring and Fall
Cool-Season Grasses for May and June
Grasses for Special Purposes
Grazing Management Based on How Grasses Grow
A Pasture System for You
Interseeding for Pasture and Range Improvement
Fertilizing Pasture and Hayland
Chemical Weed Control in Pasture, Range, and Hayland

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