

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Historical Materials from University of
Nebraska-Lincoln Extension

Extension

1994

G94-1198 Switchgrass and Big Bluestem for Grazing and Hay

Robert B. Mitchell

University of Nebraska - Lincoln, rob.mitchell@ars.usda.gov

Lowell E. Moser

University of Nebraska - Lincoln, lmoser1@unl.edu

Bruce Anderson

University of Nebraska - Lincoln, banderson1@unl.edu

Steven S. Waller

University of Nebraska - Lincoln, swaller1@unl.edu

Follow this and additional works at: <https://digitalcommons.unl.edu/extensionhist>



Part of the [Agriculture Commons](#), and the [Curriculum and Instruction Commons](#)

Mitchell, Robert B.; Moser, Lowell E.; Anderson, Bruce; and Waller, Steven S., "G94-1198 Switchgrass and Big Bluestem for Grazing and Hay" (1994). *Historical Materials from University of Nebraska-Lincoln Extension*. 1314.

<https://digitalcommons.unl.edu/extensionhist/1314>

This Article is brought to you for free and open access by the Extension at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Historical Materials from University of Nebraska-Lincoln Extension by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.



Switchgrass and Big Bluestem for Grazing and Hay

The grazing management and cultural practices discussed in this NebGuide can make switchgrass and big bluestem high quality summer forage.

Rob Mitchell, Research Assistant
Lowell Moser, Professor of Agronomy
Bruce Anderson, Extension Forage Specialist
Steve Waller, Professor of Agronomy

- [Adaptation and Yield](#)
- [Grazing](#)
- [Winter Grazing and Calving Pastures](#)
- [Haying](#)
- [Fertilization](#)
- [Prescribed Burning](#)

Switchgrass and big bluestem are native warm-season grasses that can provide abundant, high-quality forage during summer. Switchgrass and big bluestem produce 70 to 80 percent of their growth after June 1 in Nebraska, while more than 75 percent of cool-season grass growth, such as brome grass and bluegrass, occurs before June 1. Therefore, switchgrass and big bluestem can provide forage to graze after cool-season pastures have been utilized.

However, switchgrass and big bluestem must be managed differently than cool-season grasses. Poor management will cause productivity and stand persistence to decline, and forage quality will be poor. Proper grazing management and cultural practices will optimize production, maintain a healthy plant community, and provide adequate forage quality.

Adaptation and Yield

Switchgrass and big bluestem are adapted to most soils throughout the eastern half of Nebraska. Yields vary considerably among sites due to soil and precipitation differences. Both species can be grown in mixtures or monocultures, but switchgrass is grazed more efficiently in a monoculture than in a mixture. For more specific information on areas of adaptation, potential yields, and growth and development consult Extension Circulars *EC 90-120, Certified Perennial Grass Varieties Recommended for Nebraska*, and *EC 86-113, A Guide for Planning and Analyzing a Year-round Forage Program*.

Grazing

Proper grazing management is crucial to maintain dense stands of switchgrass and big bluestem. Before

grazing, consider type of grazing system, season of use, duration of use, extent of defoliation, and type of grazing livestock.

Switchgrass and big bluestem pastures can be stocked continuously or rotationally. Continuous stocking, with its lower stocking density, requires the least management because livestock remain on the same pasture of switchgrass or big bluestem throughout their grazing season. This may result in poor utilization. Rotational stocking is a method of grazing that uses recurring periods of grazing and rest to improve forage utilization and provide recovery periods for the paddock. With rotational stocking, livestock graze a paddock until some predetermined criteria is reached, such as recommended stubble height or grazing readiness of other paddocks. Livestock then are moved to the next paddock. Livestock may graze a previously grazed paddock after the plants have had adequate time to rest and regrow (usually 21 to 45 days depending on environmental conditions).

Rotational stocking requires at least two paddocks or one pasture with feeding elsewhere while the pasture is not grazed. The number of paddocks may vary, but three or four are typical in rotational stocking systems. Increasing the number of paddocks has several benefits including more uniform grazing, higher quality regrowth, fewer weed problems, more uniform nutrient recycling, more stable production during drought, and higher, sustainable stocking rates. When rotational stocking is used, alternate the paddock grazing sequence from year to year. If a paddock grazed first one summer, graze a different paddock first the next summer.

Average daily gains of yearling steers typically range from 1.4 to 2.1 pounds per day when switchgrass and big bluestem are stocked continuously with the proper number of animals grazing during the summer. Average daily gains with rotational stocking may be slightly lower than with continuous stocking unless grazing is well managed. Rotationally stocked pastures usually provide 10 to 60 percent more animal days of grazing than continuous-use pastures, depending on the number of paddocks available for rotation and the effectiveness of grazing management.

Summer grazing systems are more efficient when separate pastures of warm-season grasses and separate pastures of cool-season grasses are both available and used for grazing during the summer. For example, as switchgrass or big bluestem pastures become fully used in mid-summer, remove livestock from these pastures and return them to previously grazed cool-season pastures. After sufficient regrowth has occurred, switchgrass and big bluestem can be grazed again. Do not overgraze switchgrass or big bluestem late in the summer; at least six to eight inches of growth should remain when plants go dormant for the winter. Severe defoliation of warm-season grasses in late summer will result in poor regrowth, reduced plant vigor, and potential stand thinning and weed encroachment the following spring.

Switchgrass

Switchgrass must be grazed before seedstalks develop. Before seedstalks develop, forage quality is high and palatability good. After seedheads emerge, nutrient levels become low and switchgrass becomes unacceptable as pasture. Animals are reluctant to eat mature switchgrass and may refuse it entirely if other feed is available.

Begin grazing switchgrass when it becomes ready to graze, regardless of how much grazing potential remains on cool-season pastures. Switchgrass matures earlier than most warm-season grasses, so grazing often needs to begin while cool-season grasses still provide good forage. It is better to graze switchgrass when it is ready and then graze the remaining cool-season grass later in the summer, than to finish grazing the cool-season grass first and let the switchgrass become stemmy. If switchgrass becomes stemmy before grazing begins, cut it for hay and graze the regrowth about 45 days later.

Several options are available for managing switchgrass. One option is to begin grazing when switchgrass is eight to 10 inches tall (late May to early June). Stock the pasture so livestock will consume switchgrass at the same rate that it grows. Livestock will graze off the tops of switchgrass plants rather uniformly (*Figure 1*) if coarse stems have not started to form. Keep plant height between eight and 16 inches for six to eight weeks,

then remove livestock for 30 to 45 days. Any regrowth then can be grazed to a stubble height no shorter than eight inches. Usually it is better to stock switchgrass too heavily and move animals to other pastures sooner than planned than to stock lightly and have abundant seed-head development.



Figure 1. Livestock remove switchgrass uniformly.

It is difficult to predict switchgrass growth rate and to stock it to maintain eight to 16 inches of stubble. Thus, an easier method of managing switchgrass is to begin grazing when the grass is 10 to 12 inches tall (early to mid-June) and stock heavily for two to three weeks until there is about a four to six-inch stubble. Remove the livestock and allow 30 to 45 days to recover. Graze again in August if at least 12 inches of regrowth has occurred, but graze to no less than an eight-inch stubble height. Grazing that removes young stems in early summer will reduce and delay switchgrass heading and provide higher quality regrowth forage later in the growing season.

Switchgrass is not good as the only forage source for all of June, July, and August. It is better to use switchgrass during just two of the three summer months. Either graze switchgrass uniformly in June and July or graze completely in June and graze regrowth in August. Avoid stemmy, mature growth.

Big bluestem

Big bluestem matures later in the growing season than switchgrass (*Figure 2*). Thus, it may become ready to graze at a more convenient time than switchgrass, relative to growth of cool-season pastures. Big bluestem provides excellent warm-season grass pasture that can be continuously stocked for the entire summer if cattle are turned in when the grass is 10 to 12 inches tall (early to mid June). Adequate stubble and leaf area must be maintained through correct stocking. Forage removal should equal the plant growth rate so adjust animal numbers as necessary depending on summer growing conditions. Late summer management is critical; allow at least six to eight inches of stubble to remain after September 1.

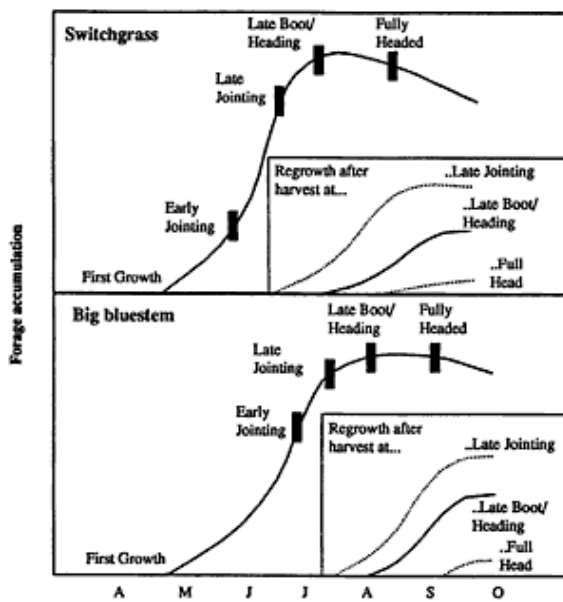


Figure 2. Forage accumulation of first growth and regrowth of switchgrass and big bluestem.

Big bluestem is well suited to rotational stocking during June, July, and August. Begin grazing when big bluestem is about 10 to 12 inches tall (early to mid-June). Graze each paddock no longer than two to three weeks to a stubble height about equal to one-half the original plant height. The grazing period on each paddock should be shorter as the number of paddocks increases. Alternatively, graze big bluestem to a stubble height of four to six inches, like switchgrass. This will require a longer rest period than when removing only one-half the growth since taller stubble will regrow faster than short stubble (weather permitting). Delay further grazing of paddocks until regrowth is at least 12 inches tall. Remove livestock during subsequent grazing periods so that the average stubble height is at least six inches. Conclude grazing around September 15 with at least

six to eight inches of material remaining on each paddock.

Winter Grazing and Calving Pastures

Top growth of switchgrass and big bluestem killed by below freezing temperatures can be grazed with little effect on plant survival. Allow four to six inches of stubble to remain until spring to help catch snow, insulate plant roots, and provide wildlife cover. Forage quality is usually very low. Therefore, feed appropriate supplements when needed since nutrient content of winter pasture usually is below animal requirements for crude protein, energy, phosphorus, and vitamin A.

Switchgrass and big bluestem can provide excellent spring calving pastures, especially when large amounts of unused residue remain for natural bedding and protection. Unused residue can be obtained several ways: harvest hay early and stockpile all regrowth, stockpile regrowth following early grazing, or avoid any grazing or haying during the growing season.

If trampling is severe on calving pastures, do not use the same switchgrass or big bluestem paddock more than two springs in a row if they also are used for some grazing or haying during summer. Paddocks used only as calving pastures can be used every year. Remove animals prior to significant spring growth (late April) to minimize trampling damage.

Haying

Harvest switchgrass and big bluestem hay according to the stage of plant growth and intended use of the hay. Proper hay management balances hay quality and quantity with livestock nutrient requirements, while maintaining vigorous stands.

Before harvest, determine the type of livestock that will be fed the hay and their nutrient requirements, as well as other feed alternatives for the livestock. Harvest before seedheads emerge for high quality hay and maximum regrowth potential. This hay will provide most of the nutrients needed by growing stock as well as first-calf heifers. For mature non-lactating cows, hay harvest can be delayed until shortly after plants develop seedheads. Hay harvested after heading will provide higher yields, but lower quality hay. Analyze each hay cutting for quality, especially for protein and energy (NebGuides *G77-331, Sampling Feeds for Analysis* and *G89-915, Testing Livestock Feeds*).

Switchgrass hay is very palatable if it is harvested before or just as the first seedheads appear. But as plants become more mature and stemmy, switchgrass hay can become unacceptable unless it is ground. Big bluestem hay also is more palatable when it is harvested early, but livestock acceptance still remains satisfactory when plants develop seedstalks.

Regrowth is influenced by initial harvest date and weather conditions. Harvest prior to the boot stage for excellent regrowth (*Figure 2*). Very little regrowth will occur following a harvest after heading. Do not harvest switchgrass and big bluestem for hay after early August unless stubble height is eight inches or more. At that time forage quality is low, regrowth is poor, and stand reductions may occur. Grazing regrowth in August after prior haying and leaving an eight-inch stubble causes less stand damage than a second hay harvest.

Cut switchgrass and big bluestem pastures for hay if forage production exceeds livestock consumption to avoid overly mature forage. Avoid giving livestock access to an area recently cut for hay. Livestock will graze young, palatable regrowth before plants have recovered fully from cutting, resulting in overgrazing. If uncut areas are in the same pasture they will be used poorly. Instead, move livestock to another pasture, move livestock to a drylot for feeding, or fence out the hayed pasture to prevent livestock access. Delay grazing the regrowth at least six weeks or until the grass is 10 to 12 inches tall. Remember, leave at least six to eight inches of stubble when grazing regrowth.

Fertilization

Switchgrass and big bluestem produce higher yields when fertilized with nitrogen and/or phosphorus (soil

tests are needed to determine rate) where sufficient moisture is available for growth (NebGuide G78-406, *Fertilizing Grass Pastures and Haylands*). But, fertilizing is economical only when extra growth is needed and can be harvested efficiently.

Fertilizing often is profitable on haylands since extra growth is harvested easily. Fertilize pastures, especially with nitrogen, only when livestock numbers exceed the growth potential of unfertilized switchgrass or big bluestem and when grazing can be managed properly. Otherwise, growth might become stemmy, less palatable, and lower quality. Animal performance will be poorer than expected and much of the extra growth stimulated by the nitrogen will be wasted.

Apply nitrogen in mid- to late May after switchgrass and big bluestem have six to eight inches of growth. Do not apply nitrogen in early spring; it will stimulate growth of cool-season grasses and weeds rather than switchgrass and big bluestem. Also, only apply as much nitrogen as switchgrass and big bluestem will use during one growing season. Nitrogen carryover into fall promotes growth of weeds and cool-season grasses, and may also contaminate water sources.

Prescribed Burning

Prescribed burning often is the most economical method to improve or maintain warm-season grass pastures. It can reduce competition from undesirable cool-season grasses and remove litter that inhibits switchgrass and big bluestem growth. Burning also will remove many woody plants (especially red cedar) that invade pasture. Proper grazing or haying management can prevent or correct most of these problems so prescribed burning may be beneficial only infrequently.

Do not burn unless it will be done safely and properly (NebGuide G88-894, *Grassland Management with Prescribed Burning*,). Burn switchgrass and big bluestem when shoots are 1/2 to two inches tall (typically late April or early May). Burning usually is not recommended during extensive dry periods, in the Sandhills, or in drier pasture areas of the state.

File G1198 under: RANGE AND FORAGE RESOURCES

B-32, Forages

Issued March 1994; 5,000 printed.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Elbert C. Dickey, Director of Cooperative Extension, University of Nebraska, Institute of Agriculture and Natural Resources.

University of Nebraska Cooperative Extension educational programs abide with the non-discrimination policies of the University of Nebraska-Lincoln and the United States Department of Agriculture.