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## Managing Smooth Bromegrass Pastures in South Dakota

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Smooth bromegrass is a cool-season grass introduced into the U.S. in the latter part of the 19th century. Because of its highly developed root system, smooth bromegrass is resistant to wide temperature extremes and extensive drought. This resistance has allowed it to become a dominant species in pastures and on native rangeland in eastern and central South Dakota. It is a leafy and sod-forming perennial that spreads aggressively through seeds and rhizomes and establishes well on deep, well-drained silt, clay loam, or sandy soils (Fig 1).

### Management

Like most cool-season grasses, smooth bromegrass grows best when temperatures are between 60 and 75° F, but it



Fig 1. Smooth bromegrass is a leafy, sod-forming perennial that spreads aggressively through seeds and rhizomes.

will grow slowly at temperatures outside of its ideal range. Growth typically begins in mid- to late April in the eastern third of the state followed by a rapid growth phase in early to mid-May (Fig 2). During the rapid growth phase, forage accumulation can quickly outpace animal intake, resulting in poor utilization and low harvest efficiency by grazing livestock.

Growth slows considerably in the heat of the summer, and plants often become dormant through July and August. Considerable fall regrowth is common as temperature and sunlight intensity decrease in early September through mid-October.

The growth pattern of smooth bromegrass presents challenges to efficient management. Many cool-season species grow most of their leaves near the base of the plant and delay stem elongation and elevation of the growing point until shortly before floral induction. However, the leaf arrangement of smooth bromegrass is mostly aerial rather than at the base of the plant, and stems begin elevating shortly after initial growth (early May). Therefore, leaves and growing points of smooth bromegrass are often entirely removed when grazed in mid- to late May, considerably reducing photosynthetic capacity and subsequent regrowth capacity.

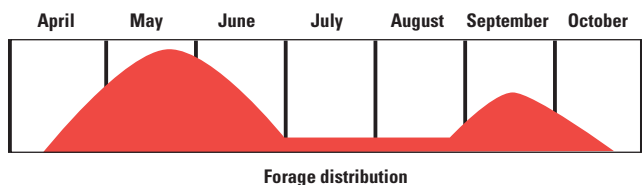


Fig 2. Forage distribution of smooth bromegrass through the growing season (Undersander et al. 2002).

Older stands of smooth brome grass become dense and sod bound, markedly lowering productivity as a result of low nitrogen (N) cycling. In pastures, smooth brome grass must be fertilized with nitrogen to avoid becoming sod bound. Although smooth brome grass will respond to N rates of up to 275 lb/acre, applying about 90 lb/acre usually produces optimum forage yields (Fig 3).

Nitrogen fertilizer applications to smooth brome grass pastures should occur in early May when the onset of the rapid growth phase occurs. Nitrogen can come from any number of sources, such as liquid N solutions, urea, or ammonium nitrate. If smooth brome grass pastures are grazed in the spring and fall, 80–20% split applications of N fertilizer in early May and early September will produce more desirable results.

Overfertilization of smooth brome grass can cause problems. Excessive N availability may lead to stem lodging, resulting in poor utilization especially in wet years. Rapid accumulation of forage as a result of excessive N applications also can lead to nitrate-N toxicity in grazing livestock. Grass tetany (Mg deficiency) in the early spring can be a problem for grazing livestock if supplemental Mg mineral is not available (refer to ExEx 2055). Soil tests should be conducted every 2 years to determine phosphorus (P) and potassium (K) needs.

Invasion of undesirable species can cause some management concerns in smooth brome grass pastures. The primary invader of pastures in eastern and central South Dakota is Kentucky bluegrass. Musk thistle, Canada thistle, gumweed, and eastern red cedar also are common invaders of smooth brome grass pastures. The best way to prevent these problems is to keep stands healthy and able to compete with invading species. You do this by proper fertilization and grazing management programs. For existing invasions, treating with herbicides and/or periodic prescribed fires is generally most effective.

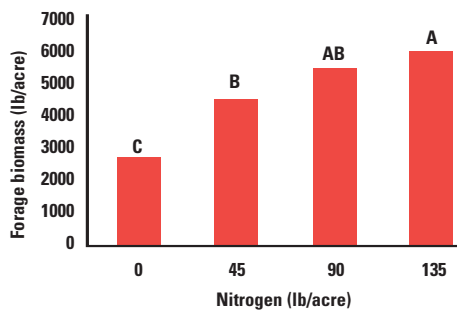


Fig 3. Forage production from the application of N fertilizer to smooth brome grass pastures in eastern South Dakota.

### Using smooth brome grass in mixtures

Using smooth brome grass in mixtures with other grasses and legumes has many advantages over smooth brome grass monocultures. Including orchardgrass and perennial ryegrass provides some management flexibility. Orchardgrass and perennial ryegrass mature later in the growing season than smooth brome grass, allowing additional forage growth in early summer after smooth brome grass has slowed growth.

Smooth brome grass generally is higher in crude protein content than orchardgrass or perennial ryegrass early in the growing season. Management, therefore, must be intensive to prevent livestock from overgrazing smooth brome grass to the exclusion of the other two species.

Legumes are also an attractive option in mixtures with smooth brome grass. Smooth brome grass mixtures with alfalfa or red clover provide high quality grazing with reduced incidence of rumen bloat when the mixture contains a minimum of 40% smooth brome grass.

Again, livestock may graze one species too heavily at the exclusion of the other, and intensive management is required. Nor is smooth brome grass particularly competitive in legume mixes if the primary objective is harvesting for hay. Managers generally make haying decisions based on maturity of the legume rather than smooth brome grass. Hay often is cut when smooth brome grass is most vulnerable to defoliation, resulting in a weakened smooth brome grass component of the stand. In general, if haying is a primary objective, orchardgrass may be a better fit with legume mixtures.

Birdsfoot trefoil is a native legume that works well in mixtures with smooth brome grass. Birdsfoot trefoil does not cause bloat in ruminant livestock and can improve overall forage quality in a pasture, especially later in the growing season.

However, birdsfoot trefoil can be difficult to establish and maintain in a mixture with smooth brome grass. Care must also be taken to ensure livestock are not allowed to concentrate grazing on birdsfoot trefoil when smooth brome grass quality becomes poor over the summer.

### Grazing management ...

Smooth brome grass pasture is most vulnerable to damage when grazed during late stem elongation and heading stages of growth. Removal of growing points and leaf

material as a result of grazing at this time will lead to thinner stands and poor regrowth. Therefore, grazing management of smooth brome grass pastures should focus on maintaining this species in a leafy, vegetative stage of growth and minimizing rapid stem development.

#### ... in spring

Initial turn-out on smooth brome grass pastures should occur when the stand produces 12–14 inches of growth. Stock at the recommended rate for your area.

Rotational grazing systems match livestock intake with forage accumulation rate during the plant rapid growth phase. In rotational systems with <6 pastures, livestock should be moved every 7 to 14 days, depending on the number of pastures, or at a stubble height of 4 to 6 inches, whichever comes first.

In more intensive systems (>6 pastures), move livestock every 1 to 4 days, depending on the number of pastures, and graze pastures twice or to a stubble height of 4 to 6 inches, whichever comes first. Rest periods between grazing periods should be between 20 to 30 days in the early growing season.

#### ... in summer

After June 15, growth of smooth brome grass begins to decline rapidly, and often it will go dormant as temperature and light intensity are at their highest over the summer. Animal performance will decline rapidly as smooth brome grass leaves begin to senesce. Using smooth brome grass pastures in a complementary grazing system with warm-season grasses (that produce most of their forage during the hot summer months) generally works well.

Complementary grazing systems improve forage utilization, stand maintenance, and animal performance of both pasture types by utilizing forage species at the peak of their respective growth cycles and deferring them when conditions are not favorable.

If smooth brome grass is stockpiled during spring growth to be grazed during the summer months, spring stocking

rates should be reduced dramatically to provide animals enough forage. Stubble heights of smooth brome grass pasture should never be shorter than 4 to 6 inches during the summer to avoid heat stress damage to the stand. If fall grazing from pastures is desired, animals should be removed from pastures 35 days before turn-out onto fall pastures or when the minimum stubble height is reached, whichever comes first.

Summer stockpiled smooth brome grass pastures should be considered low quality forage that will require at least 0.25 lb/day of crude protein supplementation for lactating/gestating females and growing animals to maintain body condition.

#### ... in fall

If adequate moisture is available, a flush of growth from smooth brome grass can be expected after early September as temperature and sunlight intensity begin to decline. At least 8 to 10 inches of regrowth should be available before turn-out onto fall pastures.

Animals should be removed from fall pastures no later than October 1 or when a minimum stubble height of 4 to 6 inches is reached. Grazing pastures too short or too late into the fall will reduce the amount of forage produced by smooth brome grass next spring.

### Summary

In summary, smooth brome grass can be a valuable asset to any livestock grazing operation in eastern and central South Dakota. Whether as a monoculture or in a mixture with other cool-season grass species or legumes, smooth brome grass provides high quality grazing early in the growing season. However, regrowth potential of smooth brome grass typically is low after grazing during late stem elongation or seedhead production in late spring. Older stands will require N fertilization to maintain productivity and to avoid grass from becoming sod bound. Rotational grazing of smooth brome grass works best, especially as part of a complementary grazing system with warm-season grasses through the hot summer.

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