

Role of Native Warm-Season Grasses

by Alexander J. Smart, South Dakota State University

Pasture vegetation in the upper Midwest is predominantly made up of introduced cool-season grasses and legumes. The Great Plains (GP) states of North Dakota, South Dakota, and Nebraska, are fortunate to have native pastures. In the eastern GP these native pastures are remnants of the historic tallgrass prairie. In the north, the vegetation is a mixture of cool- and warm-season tall grasses and mid grasses. In the south, vegetation is predominantly tall warm-season grasses.

My observation over the past 15 years of research in this semiarid region of the GP has influenced my belief that warm-season grasses are tremendously important for livestock production, wildlife habitat, and nutrient cycling. I also have come to the conclusion that big bluestem is the king of tallgrass prairie (see photo).

Big bluestem prairies still dominate much of eastern Oklahoma and Kansas due to the rocky terrain of the Osage Hills and Flint Hills. In eastern Nebraska, little prairie exists because of the highly tillable land. However, in eastern South Dakota, as much as 15% of the original tallgrass prairie still remains. In North Dakota, the Prairie Pot Hole region, with its many lakes and glacial till, has large contiguous grasslands still left intact. Big bluestem is the principle tall grass species on the ecological site descriptions of these soils.

In semiarid grasslands, evaporation exceeds rainfall. High evaporation rates usually occur in this region during the warm summer months. Warm-season grasses have an advantage over cool-season grasses because their optimum temperature for photosynthesis is 90°F compared with 65°F for cool-season grasses. In addition, warm-season grasses are more efficient in water and nitrogen use. Therefore, in the hot, dry summer months of July and August, warm-season grasses are green and rapidly growing compared to the dormant cool-season grasses.

Grazing practices that involve a sequential rotation of cool-season and warm-season pastures are commonly used to alleviate the “summer slump” in cool-season pastures. Typically, a producer grazes cool-season pastures in spring and fall and warm-season pastures in July and August. Often monocultures or simple mixtures of big bluestem, switchgrass, or indiangrass are sown. A common recommendation is a ratio of 4:1 cool-season to warm-season pasture. In more northern regions of the eastern GP, this is not practiced because native pastures have both cool- and warm-season grasses. In June, cattle can often be observed switching from cool-season grasses to warm-season grasses as they begin to rapidly grow. Rotational or season-long continuous grazing systems both produce excellent gains. A more common problem is the invasion of exotic cool-season grasses such as Kentucky bluegrass or smooth brome grass at the expense of the native vegetation. The consequence is pasture with a shortened growing period and less evenly distributed high quality and quantity of forage. Suggested tools to manage invasive species such as Kentucky bluegrass or smooth brome grass include early, heavy spring and fall grazing with lighter grazing in the summer and prescribed spring fire.

Warm-season grasses are very important to semiarid grasslands where summer growing conditions limit cool-season grass production. Besides the benefits to cattle production, these grasses also provide the structural characteristics necessary for wildlife habitat and lengthen the seasonal nutrient cycle which has important implications in carbon sequestration.



Big bluestem in Brookings County, SD (Photo by A.J. Smart 2004)

