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Managing Kansas Flint Hills Grasslands

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A RANCHER BURNING HIS PASTURE

Managing Kansas Flint Hills Grasslands

The Tallgrass Prairie once encompassed some 150+ million acres in the central Great Plains area. Because of the relatively high rainfall in the region and the grassland dominance, the soils there were among the best in the world for crop production.



Grass root systems live for 1-3 years and are a continual supply of organic matter enhancing soil fertility. So, if it could be plowed, it was! Due to the geology of the Flint Hills of Kansas with interbedded shales and limestones, they remained largely unplowed and survived as the last large remnant of the once extensive Tallgrass Prairie. Only the valleys created by the rivers and creeks were extensively plowed.

Following the retreat of the last glaciation that reached into Kansas, the Tallgrass Prairie emerged as the dominant plant community over the

Flint Hills region. Soils that developed on the different topographies have given rise to a variety of plant communities. Areas with similar productivity, species composition, and reaction to grazing have been grouped into range sites. (Figure 1. Common range sites in the Kansas Flint Hills.)

The vegetation on the range sites that are not restricted in productivity due to soil depth or clayey soils is a mixture of cool- and warm-season species, dominated by the warm-season tallgrasses, big bluestem (*Andropogon gerardii*), indiagrass (*Sorghastrum*

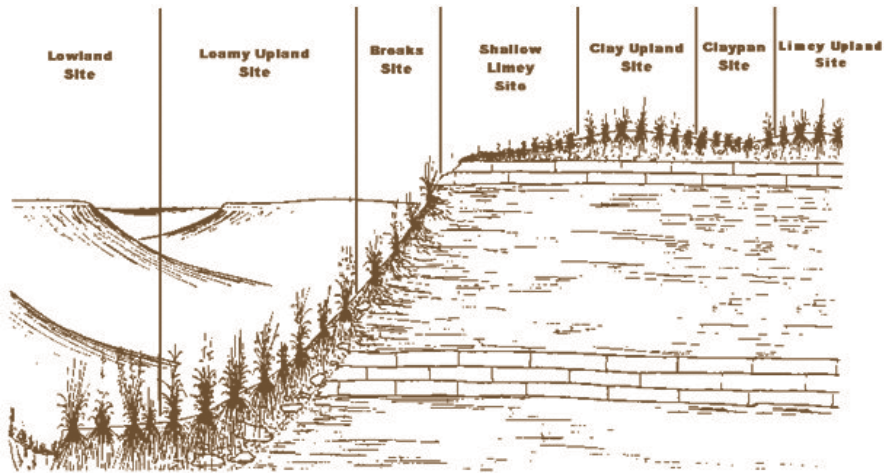


FIGURE 1. COMMON RANGE SITES IN THE KANSAS FLINT HILLS.

nutans), and the midgrass, little bluestem (*Andropogon scoparius*). Total perennial grasses make up 85% of the plant composition. On regularly-burned areas, Kentucky bluegrass (*Poa pratensis*) and members of the sedge family, (C3) make up 5-7%. Principal forbs also make up 5-7 % of the stand and include ironweed (*Vernonia baldwinii* var. *interior*), western ragweed (*Ambrosia psilostachya*), Louisiana sagewort (*Artemisia ludoviciana*), and manyflowered scurfpea (*Psoralea tenuiflora* var. *floribunda*). Commonly,

long-term unburned areas will have large populations of Kentucky bluegrass, buckbrush (*Symphoricarpos orbiculatus*), roughleaf dogwood (*Cornus asperifolia*), and eastern redcedar (*Juniperus virginiana*). Average stocking rates for the Flint Hills are 4.0 acres per yearling steer and 6-8 acres for a spring calving cow/calf pair for the growing season. The average annual precipitation varies from 30 to 36 inches with 20 to 22 inches occurring during the growing season. While fire has been given as the primary reason for maintenance of

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the tallgrass prairie, grazing also was responsible for its ability to withstand drought, fire and heavy grazing. A quality Flint Hills pasture has both grazing and fire.

Historically, the tallgrass prairie area was used from the mid-1860s to the early 1900s as a transient steer-grazing area. Steers from the southwestern United States were trailed to the Flint Hills and Osage Hills (later shipped by railroads) for summer grazing prior to being sold as grass-fat beef. Later, yearlings were summered there prior to feedlot feeding in the Kansas and other Midwest states. The grazing season for those yearlings

was typically from late April until early October. In recent years, use of intensive early stocking has meant a large number of cattle graze only 75-90 days prior to being moved to feedlots.

Prescribed spring burning of the Flint Hills is an integral part of management for increased livestock performance and maintenance of a high-quality stand of range plants. Research has shown that burning should occur at the beginning of growth of big bluestem and indiangrass. Burning earlier than that results in reduced forage production and fails to reduce woody and weed species that may have invaded. On areas burned at the beginning of growth of the dominant tallgrasses, yearling steers will gain an average of 32 lbs more than steers grazed on unburned areas. (Figure 2. 40-yr average based on research at Kansas State University.) That increased gain results from the removal of the old dead grass which results in the soil warming much faster than on unburned areas. The increased soil temperature speeds

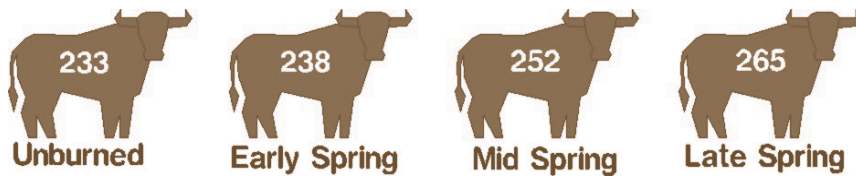


FIGURE 2. STEER GAINS RELATED TO BURN DATE

the release of nutrients tied in dead organic matter in the soil which, when taken up by the grasses, makes the forage quality higher on the burned area. Fire in the tallgrass prairie is essential in its maintenance, and its elimination would be an ecologic and economic disaster.

[Figure 2. Steer gains (lb) on areas burned near Manhattan, KS in the early spring (March 20), mid-spring (April 10), and late spring (May 1).] Burning dates are progressively earlier for more southerly Flint Hills locations.

The answer to the question of how often a rancher should burn his pasture depends on whether he has a stocker or a cow/calf operation. Stocker operators should burn their pastures every year since the increased steer gain resulting for burning only occurs during the year of the burn. For cow/calf operators,

burning does not have to occur every year. However, periodically, in order to retard invasion and increased growth of woody and weedy species, their pastures should be burned for three consecutive years. Lack of fire will lead to a closed canopy woodland.

In the late 1970s, researchers at Kansas State University released a study that they termed “intensive early stocking” (IES). That grazing scheme, nicknamed “double stocking” by the ranching community, doubled the number of steers during the first half of the grazing season followed by their movement to feedlots in mid-July. Mid-July placement of steers in the feedlot has the advantage of finishing their feeding prior to the cold mid-winter period compared to steers that are placed in the feedlot in early October that finish in January. IES increases gain per acre



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without reducing individual animal gains because steers only graze during the early season when forage quality is high. The result is typically more profitable than traditional summer-long grazing. Many ranchers quickly adopted that grazing scheme and today a substantial portion of the Flint Hills is grazed using that system. One of its advantages has been an increase in the amount of a pasture that burns. Typically, on season-long grazed areas only 65-70% of a pasture burns. Double-stocked pastures will have 80-90% of the area burned. That increased burned area

helps to maintain a high-quality grassland.

Management of tallgrass prairie in the Kansas Flint Hills centers around stocking at the proper rate and burning frequently at the proper time. Flint Hills ranchers have been doing that for the past century and a half, and we are blessed through their efforts with the magnificent Flint Hills.

Clenton Owensby is a professor at Kansas State University in the Department of Agronomy.