



# Native Hay Meadow Management

Gene Towne  
Extension Assistant

Paul D. Ohlenbusch  
Extension Specialist  
Range and Pasture Management

Department of Agronomy

**P**rairie hay provides relatively inexpensive supplemental forage for livestock and is a valuable asset to Kansas producers. Native hay meadows, however, require careful management for sustained high quality and forage yield.

## Time of cutting

Harvest date is the most important factor in hay meadow management. It affects forage quality, yield, stand composition and regrowth. Maximum quality and yield cannot be achieved in the same harvest. Hay quality peaks early in the growing season and progressively declines during summer (see figure). Highest herbage yield occurs late in the growing season, but 75 percent of hay has been produced by mid-July. Cutting in early July in southern Kansas or mid-July in northern Kansas is the best compromise between yield and quality.

High quality is as important as high yield. Crude protein and available energy levels decline with increasing maturity, and after early July the nutritional value of prairie hay drops rapidly. Total pounds of crude protein removed from a meadow are higher in July than in August or September.

Delaying harvest to obtain higher yield affects more than hay quality. Cutting native hay in August or September does not give the warm-season perennial grasses sufficient time to rebuild carbohydrate root reserves before frost. Low root reserves weaken

plants, and grass production is reduced the following year. Repeated late-season harvesting diminishes the vigor of perennial grasses, and undesirable weeds and annual grasses invade. Total hay yield and production of desirable species decline over time. If a meadow cannot be harvested by August, it is best not to cut at all, and graze the area after frost.

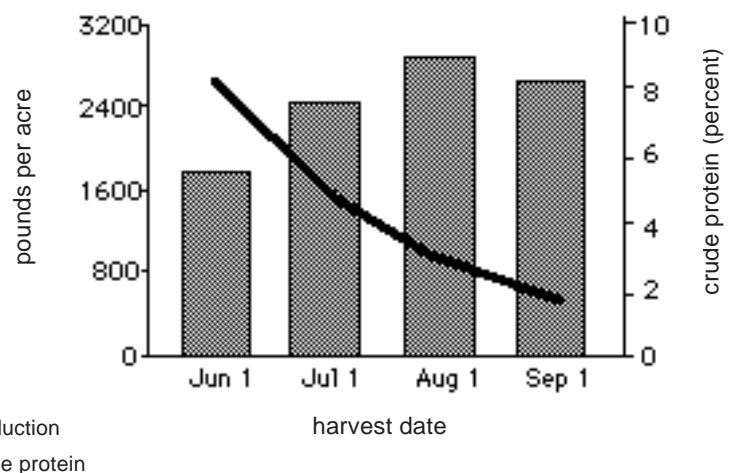
## Cutting Height

Residue and litter left on the ground in the fall protect against erosion and conserve soil moisture, improving hay yield the following year. Harvesting at a 3- to 4-inch height normally leaves sufficient stubble for regrowth and soil cover. In drought years, raise the cutting height.

## Grazing

Following harvest, perennial grasses need the rest of the growing season to replenish their root reserves. After frost, the meadow can be grazed without adversely affecting next year's production. Heavy grazing during winter, however, may increase runoff and reduce soil moisture. Grazing should be as uniform as possible, leaving at least 3–4 inches of growth so the meadow can be cleanly burned in the spring.

Time of harvest determines the yield and quality of prairie hay.



## Prescribed Burning

Prescribed burning improves both forage quality and yield. Burning removes mulch and old growth that reduces hay quality. The best time to burn native hay meadows is mid- to late-April when big bluestem and Indiangrass are 1–2 inches tall. To increase desirable warm-season grass production, hay meadows should be burned at least every 2 or 3 years. If the hay meadow is fertilized, annual burning is usually required to prevent vegetative shifts to cool-season grasses and annual forbs.

Prescribed burning in late spring is an important tool for controlling weeds, brush and undesirable cool-season grasses. One exception is prairie threeawn, an unpalatable annual grass that must be burned in November to be controlled. Because winter burning can reduce forage production, a hay meadow should not be burned in November unless it is heavily infested with threeawn.

## Fertilization

Nitrogen fertilizer, along with adequate rainfall, increases hay growth, but its effect on native warm-season grass production is limited. If annual grasses or forbs are present in the hay meadow, nitrogen fertilization increases their production. Do not apply more than 30–40 pounds of nitrogen per acre. Even then, nitrogen fertilization may not be economically feasible.

Native hay meadow soils frequently are deficient in phosphorus, and in some areas of the state, applying 10 pounds of phosphorus per acre can increase hay production. Phosphorus fertilization often benefits broad-leaf forbs more than it does native warm-season grasses.

If a hay meadow is fertilized, nitrogen and phosphorus should be applied when warm-season grasses are growing and have reached 3–5 inches. Earlier fertilization favors production of annual forbs and undesirable cool-season grasses such as Kentucky bluegrass and annual bromes. If plant composition begins to shift, burn fertilized hay meadows annually.

## Weed and Brush Control

Many perennial forbs improve hay quality and do not compete with grasses for moisture or nutrients. Harvesting by mid-July controls most undesirable annual weeds. Leaving hay bales in the meadow kills underlying vegetation and provides spots for annual weed invasion.

Prescribed burning controls most weed and brush species. Smooth sumac is resistant to fire, however, and may require spot herbicide applications. Herbicides may kill both desirable and undesirable shrubs and forbs, but may not increase forage production enough to be economically justified. Apply only herbicides labeled for target weed species and registered for use in hay meadows. Pay particular attention to the waiting period between herbicide application and harvest. Consult your county Extension office for the latest recommended chemicals.

## Drought

Under drought conditions, harvest date and cutting height are critical in maintaining a productive meadow. Cut no later than mid-July and leave at least 3–6 inches of stubble. If the forage is not tall enough by mid-July to justify harvesting, the area can be grazed after the first killing frost.

## Summary

■ Harvest date is the most important factor in managing native hay meadows. Cutting by early July in southern Kansas and by mid-July in northern Kansas is best for obtaining both high forage quality and yield. Cutting later in the growing season reduces hay quality and shifts the plant population to undesirable weedy species.

■ Prescribed burning controls weeds, brush and cool-season grasses, and increases production and quality of desirable warm-season grasses.

■ Nitrogen and phosphorus fertilization increases hay yields, but usually favors forb and cool-season grass production unless applied in conjunction with annual prescribed burning.

## Related Publications

Range Grasses of Kansas (C-567)

Prescribed Burning: A Management Tool (L-815)

Prescribed Burns: Planning and Conducting (L-664)

Prescribed Burning Safety (L-565)

Rangeland Weed Management (MF-1020)

Rangeland Brush Management (MF-1021)

Chemical Weed Control for Field Crops, Pastures, Rangeland and Noncropland (Report of Progress issued annually)

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