



# Managing Native Hay Prairies

Missouri Job Sheet

JS-MO643 Managing Native Hay Prairies

Natural Resources Conservation Service (NRCS)  
November 2015

Missouri Conservation Practice 643

<b>Landowner/Producer:</b>		<b>Farm #:</b>
<b>Field/Stand(s):</b>	<b>Acres:</b>	<b>Tract #:</b>
<b>Planned By:</b>		<b>County:</b>
<b>Contact Information:</b>		<b>Date:</b>

PROPER MANAGEMENT IS CRITICAL TO MAINTAINING A PRODUCTIVE AND DIVERSE PRAIRIE

**PURPOSE:**

Remnant native prairies can still be found in parts of southwest and west central Missouri. A few small prairies also occur in north and southeast Missouri. Many of these prairies exist today as hay prairies because they produce an inexpensive and dependable source of forage for private landowners. However, reduced production and lower quality forage from continuous late season haying, short cutting heights, nutrient removal without fertility replenishment, introduced cool-season grass invasion and absence of periodic burning have reduced hay yield. As a result, many remnant prairies have been converted to cropland or introduced grass and legume pastures. Private landowners can improve native prairie hay production and wildlife habitat by using the following guidelines.





## SPECIFICATIONS:

- ❑ **Time of Cutting** – Harvest date is the most important factor in prairie hay production. Maximum tonnage and highest quality do not occur at the same time of the year. Maximum tonnage is obtained in August, but the highest quality occurs in early-May. The best compromise of forage quality and forage quantity is to hay in late-June to mid-July. Cutting after mid-July reduces the ability of the plants to rebuild root reserves for next year's growth, thereby reducing next year's hay yield by as much as 50 percent. Continually haying in August or September will eventually change the stand composition of the prairie. As desirable warm-season grasses are weakened by late cutting, undesirable forage plants such as goldenrod and broomsedge invade.
- ❑ **Cutting Height** – The optimum cutting height for native prairie is 3 to 4 inches. Cutting at this height leaves more leaf area for rapid regrowth to rebuild root reserves for next year's production. Cutting height also becomes more important as the cutting date is delayed. Increase cutting height one inch for every two week delay after mid-July. **Never take a second cutting or graze after haying a prairie.** The regrowth is essential for rebuilding root reserves. The yield gained from a second cutting will often reduce yields by the same amount the following year.
- ❑ **Fertilization** – Fertilizers can increase hay production, but only if application is properly timed. ***The health, vigor and productivity of a prairie must be restored through proper management (time of cutting and proper cutting height) before a favorable response can be expected from fertilization.*** Adding nitrogen alone should be avoided as this will only increase weed problems. Nitrogen should only be added if used in combination with a spring prescribed burn. Adding phosphorus and potassium will help replace soil nutrients removed in hay, and reduce broomsedge biomass, thus improving forage quality without harming species diversity or habitat quality. Adding lime will increase nutrient availability and perhaps increase production and forage quality. Adding lime, phosphorus and potassium may also improve forb (wildflower) diversity. All fertilizer blends will have some nitrogen, but choose the mix with the lowest percentage of nitrogen available. The economics of fertilizing native hay prairies ultimately depends on the value of the increased hay produced (1/2 – 1 ton/acre) and the cost of fertilizer. If possible apply fertilizer in May when warm-season grasses are 4 to 6 inches tall. ***Simply adjusting the time of the cutting to late-June through mid-July, maintaining cutting heights of at least 3 inches AND introducing prescribed burning will significantly improve forage production.***
- ❑ **Herbicides** – Avoid using broad spectrum herbicides and broadcast spraying. As many as 250 different plants occur on a healthy prairie. Most of these are palatable and nutritious for livestock and important food and cover to prairie wildlife. Regularly scout for invasive weeds like sericia lespedeza and spot treat as soon as they are found. Spot treating invasive weeds is more economical than broadcast treatments and saves prairie diversity. Remove invading trees in draws and fencerows that cannot be mowed or periodically burned. Trees outside and inside a prairie will reduce the value for grassland wildlife and be a future source for more sprouts. Consider leaving islands of desirable shrub species like wild plum and dogwood for wildlife habitat. Read and follow label directions when using herbicides.
- ❑ **Prescribed Burning** – **Prescribed burning is critical to restoring a prairie.** Burning will help improve production, control cedar sprouts, reduce undesirable cool-season grasses that can reduce production by using huge quantities of soil moisture, and improve wildlife habitat. Burn one third to one-half of the area every year on a rotating schedule until desired vegetative community is established. Maintenance burns may be needed on a less frequent cycle according to site conditions. An aggressive burn regime (burn every 1 to 3 years) on degraded native communities for several years may be necessary to reach the desired vegetative state. Refer to PRESCRIBED BURNING (338) and IS-MO338Prescribed Burning Information Sheet. Spring burning 2 or more years in succession will usually control invading cool-season grasses and some woody vegetation. Summer or early fall burning will increase forb diversity, but may also reduce native warm-season grass yield but usually not total yield. Periodic burning will also benefit wildlife by improving nesting and brooding habitat. Plan to burn no more than one-half of the prairie each year to leave some previous year's growth for nesting cover. Burn the other portion the following year.



- **Rest - Hay Rotation** – Haying one-half of a prairie and resting (not harvesting or grazing) the other half for an entire year can dramatically improve production and provide excellent wildlife habitat. While this management practice seems wasteful, prairies managed under this scenario can produce as much tonnage from one-half of the prairie as when the entire prairie is hayed annually. The rested portion will often produce enough forage the year after resting to compensate for production lost the year of rest, probably due to deeper, more extensive roots. Brushy vegetation will not be a concern even in a rest-hay rotation, especially if prescribed burning is introduced. A rest-hay rotation will also help lower equipment and fuel cost for the operator.

#### OPERATION AND MAINTENANCE - SUMMARY:

##### Haying:

1. Cut hay prairies in late June to early July to a 3 to 4-inch stubble height.
2. If wildlife is a concern, complete haying between July 16 and August 15, or refrain from haying corners, odd areas, or 30 to 60 foot borders along field edges to give ground nesting wildlife time and available habitat to complete nesting activities. Haying after mid-July should be done in conjunction with a rest-hay rotation and prescribed burning to maintain a productive and diverse prairie.
3. Strictly follow the late June to early July haying dates if equipment cannot be raised to cut at a 3 to 4 inch height. Prescribed burning and a rest-hay rotation should also be introduced to improve forage production and plant diversity. *Program policies may restrict haying heights and haying dates. Check with your local USDA Service Center for more details.*
4. Avoid cutting hay prairies in August or September. Late cutting depletes root reserves, thus reduces forage production the following year and eliminates wildlife winter and nesting cover.
5. If hay meadows cannot be cut by mid-July, consider prescribed grazing after a frost.
6. Leave all regrowth for winter and nesting cover. Avoid second cuttings or grazing a prairie after haying.
7. Remove hay bales as soon as possible to avoid dead spots and sites for invasive weeds.

##### Fertilization and Herbicides:

1. Phosphorus and potash fertilizer will replenish nutrients removed in hay.
2. Apply fertilizer in May when warm-season grasses are 4 to 6 inches tall. Prairies should only be fertilized in conjunction with spring prescribed burns to control introduced cool-season grasses.
3. Choose fertilizer blends with the lowest percentage of nitrogen available.
4. Avoid the use of broad spectrum herbicides except for spot treatments.
5. Regularly scout prairies for aggressive invasive weeds like sericia lespedeza and tall fescue and spot treat.
6. Basal-treat deciduous trees and cut cedar trees to improve prairie habitat for wildlife and to eliminate sources for future sprouts in the hay meadow.



**Management:**

1. Consider establishing a rest-hay rotation on 10 to 50 percent of the prairie each year to improve production, improve wildlife habitat and reduce overhead costs.
2. Reintroduce prescribed burning by burning 1/2 to 1/3 of the prairie. Spring burns will help control invasive cool-season grasses and some woody vegetation, while summer or early fall burning will increase forb diversity and wildlife use. If possible burn on a 3 to 4 year rotation.
3. Summer and early fall burns can significantly improve forb production for potential seed harvest.
4. Consider alternating haying with prescribed grazing every other year.
5. Avoid over seeding prairies with cool-season grasses and legumes. Introducing cool-season grass such as tall fescue will reduce forage quality and quantity in a prairie because of different maturity dates for cool- and warm-season grasses. Cool-season forages also reduce the vigor of native prairie plants and take more soil moisture than warm-season plants.
6. Consider leaving scattered clumps of shrubby cover for prairie chickens, quail broods and other prairie wildlife.
7. It is always best to combine management tools such as prescribed burning, rest-hay rotation, prescribed grazing and spot herbicide treatments to increase economic return and improve grassland health



Consult with NRCS or MDC wildlife biologists or grassland conservationist for recommendations on more complex sites. Contact your University Extension Center for additional information on wildlife management.

**PRIMARY HABITAT CONSIDERATIONS:**

- RESTORATION and MANAGEMENT of RARE or DECLINING HABITATS (643).
- Provide natural food and cover for many declining animal species.

Comment:

**I certify that the above information meets NRCS specifications and design and installation.**

\_\_\_\_\_  
**NRCS SIGNATURE**

\_\_\_\_\_  
**DATE**



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