Prescribed Grazing

William P. Wester

Man continues to rediscover fire and its usefulness. Applying the torch to rangeland has become a spring ritual in the Flint Hills of Kansas and the Cross Timbers area of Kansas, Oklahoma, and Texas. Prescribed burning is a useful and necessary tool on higher rainfall range lands invaded by woody plants (Engle 1988). Burning and/or chemical treatments will reduce the cool-season vegetation and restore the native warm-season grasses—but at a cost. Cattle grazing can be used to achieve much the same effects.

"Prescribed Grazing" was coined to describe vegetation manipulation through livestock management. Prescribed grazing has been practiced in the Loess Hills of Sherman County, in central Nebraska since 1984. The predominate range sites are classified as silt and limy-upland. Natural potential vegetation or vegetation in excellent range condition is listed as Mixed Prairie. The annual rainfall is 23 inches with a growing season of about 145 days: May 10 to Sept. 30.

About half the county is cropland and half is rangeland with mixed farming/livestock operations. Typically, cattle are summer grazed on range from May 1 to Nov. 1. After harvest they graze on cornstalks. Cornstalks provide economical and adequate nutrition for dry pregnant cows during the winter. Since cornstalks are plentiful, there is no need to defer pastures for winter use, so nearly all pastures are continuously summer grazed. This, along with other mismanagement, often leads to undesirable vegetation changes.

Warm-season grasses such as big and little bluestem, sideoats grama, and switchgrass are preferred because they provide adequate forage during the hot dry summer months. Continuous heavy summer grazing in the area favors the cool-season plants, western wheatgrass, Kentucky bluegrass, and downy brome. These species initiate growth in early April and get a headstart on warm-season grasses. They start growth earlier in the spring, use the available soil moisture, and shade the ground.

Cattle prefer the warm-season grasses and start grazing them as soon as they start growth in mid-May and quit grazing the cool-season grasses. This, plus the lush growth from the cool-season species, gives a surplus of grass in the first half of the grazing season but results in a shortage later.

Nearly all the warm-season grass is removed while only small amounts of the cool-season invaders are grazed. Even with three years rest, cool-season grasses dominate and increase in vigor, while warm-season grasses are suppressed. The result is a shift to predominantly cool-season grasses on most Sherman County rangeland.

Conventional methods to restore warm-season grasses focus on suppressing the cool-season grasses with chemical treatments. Atrazine has been successfully used to renovate rangeland in Nebraska but costs $8.25/acre and requires a three-month deferment after spraying. Prescribing burning also will reduce cool-season grass vigor. Fire is less expensive than chemical treatments, costing only $1.83 to $2.52/acre. It does require a summer deferment and a potential feed source is destroyed. In addition, burning is not a widely accepted practice in Sherman County and many other areas on the High Plains.

An alternative method for shifting grass composition to warm-season grass species is to use cattle. A Sherman County farmer came to the Soil Conservation Service for assistance in the fall of 1983. Previous deferment of a pasture for two years had only increased the vigor of the western wheatgrass. Cool-season grasses dominated and provided minimal summer grazing. The Nebraska Soil Conservation Service state range conservationist suggested heavy spring grazing to reduce cool-season vigor. Most Sherman County pastures still have warm-season grass remnants. Even though not easily found in continuously grazed pastures, they are usually present in

Added benefit from Prescribed Grazing is tall warm-season grass providing protection for baby calves in early spring.

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very low vigor.

The suggested early spring grazing treatment resulted in an increase from fair to good range condition in two years on limy-upland sites and three years on silty sites. Prescribed Grazing was a phrase coined to define this planned grazing treatment of pastures to bring about a desired vegetation change.

How did the Prescribed Grazing work? From May 24 to July 1, 1984, 97 cow-calf pairs grazed the 160-acre pasture. Cattle performance was not adversely affected until the last week, but they did consume above-average amounts of mineral. The cattle were forced to eat the senescent forage that normally was never used. From July 1 to September 1 the cattle were rotational grazed on adjoining native rangeland.

After a hard freeze in late September, the cattle were allowed to graze the dormant regrowth in the treated pasture. Several new clumps of warm-season grasses were evident in the treated pasture, but none were found in an adjoining control pasture. The deferred pasture provided valuable fall grazing for the cattle until corn could be harvested.

In 1985, the pasture was given the same treatment, but grazing was started May 1 and the cattle were removed by June 1. The cool-season grasses were used fully compared to adjoining pastures where cool-season grass headed and lost palatability.

What are the advantages of Prescribed Grazing? Three obvious advantages of the treatment were: 1) improved range condition, 2) more uniform grazing, and 3) increased forage productivity. The warm-season grasses responded quickly to the treatment. Vigor improved the first year, but not much growth occurred due to the dry summer. Two years of Prescribed Grazing resulted in more warm-season grass forage and increased vigor, which allowed rhizomes to form, increasing the number of warm-season plants during the third year.

Livestock use of the pasture was more uniform under the treatment; observations indicated that when cool-season grasses were removed by the heavy spring grazing, patch grazing was eliminated and selective grazing was reduced, creating a more uniformly grazed pasture. Forage production also increased. The increase in warm-season grass vigor allows for deeper-rooted plants which can keep reaching moisture and producing forage when shallow rooted cool-season grasses are dormant. The uniform grazing of pastures with improved range condition and more forage production resulted in an increased carrying capacity the first year Prescribed Grazing was started.

The rancher was able to graze the same number of cattle on three quarter sections of grass that normally would have required a full section with conventional grazing. The pastures are improving at the same time, even with the increased stocking rate. Before Prescribed Grazing, the ten-year average stocking rate was 0.8 AUM's/-acre. The rate increased to 1.3 AUM's/acre the first year of Prescribed Grazing. With above-average rainfall, it increased to 1.6 AUM's/acre the second year. With below-average rainfall the third year, the rate was 1.1 AUM's/-acre—a 40% improvement over continuous grazing.

Prescribed Grazing can be a viable tool to shift species composition from undesirable cool-season grasses to productive warm-season grasses. The purpose is not to destroy the cool-season vegetation components but to increase the vigor and quantity of warm-season grasses. Pastures can be improved inexpensively and provide grazing returns during treatment to offset land ownership cost. Prescribed Grazing often can be used with existing pastures at no additional cost. The Prescribed Grazing increased net income $4.62/acre the first year, while burning and chemical treatments both would have required cash expenditures in addition to income lost during pasture deferment, not allowing use of the treated pasture. Grazing also utilized the cool-season grasses as a forage source. Prescribed Grazing has been used on other Sherman County farms and has proven to be a workable alternative to enhance warm-season rangelands in central Nebraska.

Literature Cited

Engle, David M. 1988. Burning Cost in Oklahoma Rangelands. Oklahoma Agricultural Experiment Station. Journal Article No. 5247.