Prescribed Burning Rotations on Pine-Bluestem Range

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Highlight: *Burning one-seventh of a range each year in winter, one-seventh in spring, and one-seventh in summer produced no more gain on Brahman crossbred heifers than did burning one-third of the unit in winter. Average gains during the 4-year study ranged from 120 to 271 lb./head for a 168-day period, or 0.7 to 1.6 lb./head/day.*

Burning one-third of grazing units in late winter or early spring adequately distributes grazing and maintains forage quality on southern pine cattle ranges (Duvall and Whitaker, 1964). Recent investigations on ungrazed range indicated, however, that forage quality might be further enhanced by burning smaller patches in winter, spring, and summer. Forage regrowth following a July burn was higher in protein than that on plots burned in March or May and clipped monthly (Grelen and Epps, 1967). If this high-quality forage was made available to cattle in midsummer when protein content of forage on winter burns is often deficient, it appeared that animal gains would improve. We report here the results of seasonal and winter burning for 4 years on grazed range in central Louisiana.

Procedures

Two adjacent 80-acre grazing units of the Palustris Experimental Forest near Alexandria, La., were selected for the study. Both sites are typical of the flatwoods of south-central Louisiana. All commercial-sized pines were removed several years before the study began, and large hardwoods were killed by herbicide injections. Fire and livestock were excluded for 5 years preceding the study. Consequently, many seedlings and saplings of longleaf pine *(Pinus palustris* Mill.) and loblolly pine (*P. taeda* L.) were present, and scrub hardwoods and shrubs, primarily blackjack oak *(Quercus marilandica* Muenchh.) and southern waxmyrtle (*Myrica cerifera* L.), had grown too large for effective control by fire. In open areas, dense grass, principally pinehill bluestem (*Andropogon divergens* [Hack.] Anderss. ex Hitchc.) and slender bluestem (*A. tener* [Nees] Kunth), was interlaced with blackberry briers (*Rubus* sp.). Exclusion of fire and grazing had allowed an increase of cutover muhly *(Muhlenbergia expansa*

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Manuscript received April 26, 1972.

Table 1. Cumulative heifer gains (lb.) on winter and seasonally burned range during 168-day grazing periods. Yearlings grazed in 1967 and 1969, 2-year-olds in 1968 and 1970.

Year and burning treatment	Stocking rate (acres/AU[1])	Average initial weight	Average seasonal gain	Average daily gain	Average gain/acre
1967					
Winter	6.3	343	138[2]	0.8	31.0
Seasonal	6.3	359	103	0.6	23.2
1968					
Winter	11.1	454	154	0.9	15.4
Seasonal	11.1	454	164	1.0	16.4
1969					
Winter	11.4	438	174	1.0	21.8
Seasonal	11.4	446	186	1.1	23.2
1970					
Winter	17.7	558	259	1.5	16.2
Seasonal	17.7	555	282	1.7	17.6

[1]Based on conversion factors of 0.7 animal units (AU) for yearlings and 0.9 for 2-year-olds (Range Term Glossary Committee, 1964).
[2]Only in 1967 did seasonal gains differ significantly by treatment.

[DC.] Trin.), an early-maturing grass that is unpalatable to cattle in the full-leaf stage.

A different third of one unit was burned each March 1 (winter). Approximately three-sevenths of the other unit was burned each year—one-seventh in winter (March 1), one-seventh in spring (May 1), and one-seventh in summer (July 1). The first treatment was designated winter burning and the second, seasonal burning.

Brahman crossbred heifers grazed the study units from mid-April through October. Yearlings grazed both units during the 1967 and 1969 seasons, and 2-year-olds during 1968 and 1970. Stocking rates, which were equal for both study units, varied from 6 to 18 acres/animal-unit during the study. Animals were randomly assigned to study herds and weighed individually at 28-day intervals. Loose salt and steamed bonemeal (10% phosphorus) were provided free-choice, and cottonseed cake was fed occasionally to facilitate handling.

Herd gains were compared by the "t" test for unpaired replicates, with significance tested at the 5% level.

Results and Discussion

In 1967 the herd on winter-burned range significantly outgained the one on seasonally burned range, but in other years neither significantly outgained the other (Table 1). Spring gains tended to be highest on the winter-burned range, whereas total gains tended to be highest on the seasonally burned.

Gains per animal were inversely related to stocking rate—they were greatest in years of lightest stocking (Table 1). Gains per acre were directly related to stocking rate; gains were highest with heaviest use. With similar stocking rates, yearlings outgained 2-year-olds.

Animal gains reported here were higher than those on longleaf pine range in Mississippi (Smith et al., 1958), where yearling and 3-year-old steers gained about 0.5 lb./head daily during a comparable grazing period.

Seasonal burning offered no apparent advantage over winter burning in beef production. The lack of a statistically significant difference probably reflects the benefits of proper grazing on winter-burned range, rather than a failure of seasonal burning to improve forage quality. With proper stocking, the one-third of the range burned in winter of the current year was grazed almost continuously by the entire herd. Close grazing maintained a supply of new forage growth, which was apparently as palatable and nutritious as that on seasonally burned range. Because different thirds are burned in the 2 years following heavy use, the plants had 2 years of light grazing in which to regain vigor. Thus, close grazing accomplished on the winter-burned range what the delayed burns did on seasonally burned range. Both provided high-quality forage through much of the grazing season. The winter burning rotation, because of its simpler and less expensive application, is recommended for forage management on forested or clearcut native range in the longleaf-slash pine timber type.

Literature Cited

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