The South Needs Range Men[1]

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Highlight

Forest range is an important source of forage for the big and growing business of livestock production in the South. People trained in management of southern ranges are needed for effective utilization of the South's grazing resource but the supply is too limited. The South needs a range curriculum.

Livestock production is a big and growing industry in the South. In 1964 southern states produced about one-third of the total national production of beef cattle. With a growing season of 5 to 12 months and plenty of rain, the South can produce the necessary forage and will play a major part in meeting future demands for beef. Forest range is an important source of this forage.

But for effective utilization of the South's grazing resources, there's a definite need for people trained in the management of southern ranges. Unfortunately, the supply is too limited. For example, we have 115 rangers on the 33 National Forests in the 13 southern states and only one has a degree in range management. Of the total of some 4,700 Forest Service employees in the Region, fewer than 10 have a background of formalized training in range management. And all but two of these are western born, western trained and western oriented.

Although formal range education began in the East at Yale University and Iowa State College, the hard core science of range management was largely developed in and for the West. By 1917 the University of Idaho and Montana State University were offering formal training in range management with a course of study designed to assist with the problems of the West. Today all 17 institutions offering curriculums in range management are west of the Mississippi River.

What is more, most people trained in range management prefer to work out West. Although the South in the past has recruited western-trained people and attempted to get on top of the range job, few have stayed long enough to recognize the difference between the range job needed in the South and that practiced in the West. At the first opportunity they are gone, leaving behind foresters who by training and choice are not prepared for, or interested in, the range job.

The two Forest Service employees in the Southern Region who are native southerners and have training in range management are excelling in performance and accomplishment. However, they are lacking in several areas of formalized training desirable and eventually necessary for working with ranges in the South. On the 115 Ranger Districts, 61 rangers are involved in analyzing the grazing resource and designing plans and programs for managing this resource. All of them recognize their lack of training in the range management disciplines. All are begging for trained help.

Although we have an intensive on-the-job training program to try to help compensate for their lack of formal range training and experience, we are a long way from scientific range management. Apparently, we also are still further away from getting the type of trained people we need to do the southern range job.

There are several areas peculiar to the South that require certain disciplines or emphasis not stressed in western-oriented range schools. I realize that in adjusting curricula to Regional needs, graduates of the baccalaureate program may not be professional range men in the strictest sense of the word. They can be, but it may take five years instead of four. Let's look at some of the areas where Regional emphasis in training is needed to do the southern range job.

Most of the grazing in the South that is not on improved pasture is under a commercial forest canopy. Here both the overstory and understory are kept in a vigorous subclimax condition by short cutting cycles, prescribed burning and extensive ground preparation for regeneration. These are normal silvicultural practices for the southern forest types. Not only does volume of forage follow these changes in overstory but dynamic changes occur in understory composition over relatively short periods of time. It is within this rapidly changing environment that our range program is conducted.

Analysis and interpretation of understory condition and trend is a delicately complex job. Commonly used systems for measuring these changes and for interpreting them with reference to grazing programs are not satisfactory for use in the South since they do not take into consideration the suppressive effects of tree crown density and related factors. The short range vegetational changes in the forest cover create problems in developing and coordinating practical range programs in the South that are uncommon in the West. Because of the influence of the timber overstory and its management on the range resource and the delicate timber-range coordination job, the southern range man should have a background in forestry, oriented toward silvics and silviculture.

The South has never been fully botanized and much is still unknown about species composition and relative forage values of many native ranges and range

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plants in the South. Southern-trained foresters know their trees and most of them know the principal browse and some field and pasture plants. However, agrostology is completely foreign to most. True, western schools include some southern species in botany and agrostology courses. But the emphasis is regional. Range management requires a complete knowledge of native forage species and their relative value and importance. The expansion and improvement of the range livestock industry provides a need and a reason for southern regional emphasis on agrostology, including both native and introduced species. Until there is a southern-oriented range curriculum developed, knowledge of range forage plants by southern range men will generally be less than satisfactory.

One big factor in an argument for a southern-oriented range curriculum is the social and economic structure of the South. There are sharp contrasts in this structure and regional differences of the southern individual and the southern society. Range-trained people working in the South must have a knowledge of and feeling for these differences. The southern range man must be able to interpret the social, political, and economic environment in which his company or agency operates. Computer and research techniques will help but in the final decision, the southern range man must draw from his imagination, training, and experience in the areas of human behavior where scientific predictions are highly fallible.

There are a number of other regional differences that require regionally-oriented techniques. Such things as animal breeds and breeding, woodland ecology, plant and animal pathology, plant and animal nutrition, and many others have their best training effectiveness when taught in the area where they are to function. Regional training is mandatory in programs where knowledge of the physical and social environment is necessary to success. To be most effective in the South, the southern range man must be generally southern-raised, southern-trained, and oriented in southern physical, socio-political, and economic disciplines.

In 1952 a standard range curriculum was developed by a committee in the American Society of Range Management for guidance of schools interested in establishing a range curriculum. These standards were divided into three groups: (1) basic courses in English, mathematics, chemistry, economics, etc., (2) technical courses for all professional range managers, and (3) elective courses for broader preparation for range managers in certain fields or certain agencies. To these should be added the importance of recognizing regional differences to fully meet the needs of various agencies and various fields of range management. The entire standard curriculum—basic, technical and elective—should be geared, when possible, to the conditions and needs of the region in question.

I contacted 10 major colleges and universities in the South sometime ago, exploring their attitude toward establishing a range curriculum in their schools. In making these inquiries, I listed generally the standard or core requirements as outlined by ASRM, called special attention to those needing regional emphasis, and added several subject areas particularly needed for regional application in range management. Four of the 10 contacted were enthusiastic and could orient subjects in all three categories—basic, technical and elective — toward a southern range curriculum without major adjustments in their program. Three stressed adding range at the elective and graduate level only and three were skeptical though encouraging. Of course, all were interested if there was a market for their students once they were trained in range management. Clemson University said it could justify a range curriculum if it could be assured that 10 graduates each year would be absorbed into the profession. Louisiana State suggested that 50 a year would be necessary for it to justify a curriculum.

A brief analysis of the market for southern-oriented range students was quite enlightening. In my own agency, the U. S. Forest Service, we have 73 positions where range training either is mandatory now or will be necessary eventually. The salary for these jobs ranges from a low of $5,100 a year to as high as $14,600. The average tenure is three years with about 26 positions to be filled each year where a range management background is desirable or mandatory.

The U.S. Soil Conservation Service needs range-trained people in the South and 11 large timber companies have requested aid in planning and carrying out range programs on their lands. All could use range-trained people and all expressed the desirability of these range-trained people being southern oriented.

The fact that there are now over 100 members in the Southern Section of ASRM is a good indication of growing interest in the field in the South. Director John Gray, University of Florida, had this to say in his reply to my letter to colleges and universities: "If a committee of the American Society of Range Management could be set up to survey potential employers in the southern states and come up with some convincing figures as to the number of men who would be hired by them, starting in 1970, I believe this, more than any other single action, would help break the ice and get some of us going in the training of men in this field."

A committee of the American Society of Range Management is needed to analyze the need for a range curriculum and to make its analysis available to the major schools of forestry in the South. If such a curriculum is established it should follow the recommendations of the Range Education Council as to specific disciplines needed for maintaining high professional standards.

The South, in my opinion, certainly needs a southern range school.

Season of Burning Affects Herbage Quality and Yield on Pine-Bluestem Range

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Highlight

Burning different portions of a range in winter, spring, and summer provided adequate protein in herbage for a much longer period than winter burning alone. Phosphorus was deficient the year round, regardless of burning schedule.

Herbage on unburned pine-bluestem range is generally deficient in protein after early summer and in phosphorus all year (Campbell and Cassady, 1951). The widespread practice of burning in late winter increases protein and phosphorus in new growth, but the benefit endures only until May, when the young-leaf stage ends (Campbell et al., 1954). Heavy grazing in spring prolongs the young-leaf stage, but herbage on winter burns contains appreciably less protein and phosphorus from summer to early fall than in spring, regardless of harvesting intensity (Cassady, 1953; Duvall and Whitaker, 1964).

The nutrient content on range burned in late spring or summer has not previously been studied in the longleaf pine-bluestem type. On Kansas bluestem pasture, protein content in June was higher following a late-spring burn than earlier burns (Aldous, 1934). This result indicated that burning different segments of a range at intervals from winter until midsummer might furnish forage high in nutrient content throughout the growing season. This paper compares herbage quality and quantity following winter fire with that following spring and summer fires.

Procedure

A well-drained, sandy upland site on the Palustris Experimental Forest in central Louisiana was chosen for the experiment. The site is typical of much of the longleaf pine-bluestem range. The area had been logged and was burned in 1961. It was not grazed. Ground cover consisted mainly of grasses, predominately pinehill bluestem (*Andropogon divergens* (Hack.) Anderss. ex Hitchc.) and slender bluestem (*A. tener* (Nees) Kunth). The soil is Ruston fine sandy loam. Rainfall in the area averages 58 inches/year and more than 4 inches/month in every month except October.

In 1962, plots 100 ft square were burned on March 1 (winter), May 1 (spring), or July 15 (summer). The winter burn was considered the control, because most burning is done in the South at this time. Burning treatments were replicated four times in a randomized block design. The burns were repeated on the same plots in 1963, except that the summer plots failed to burn uniformly and hence were not measured.

Nine 1.55-ft-square quadrats were systematically located on each plot after burning. To simulate grazing, the quadrats were clipped monthly during the growing season. In 1962, two clippings were omitted because growth was negligible. Herbage was clipped 2 inches above the ground except on the last harvest of each year, when it was clipped to 1 inch. In February 1963, a sample of vegetation that had remained undisturbed since burning was taken adjacent to every quadrat. Samples were oven-dried at 75C, weighed, ground in a Wiley mill, and analyzed for crude protein and phosphorus.

Results

Protein Content.—On June 1, protein content of herbage was significantly higher (0.05 level) on spring-burned than on winter-burned plots (Fig. 1). In both years, protein content was 8.4% on spring-burned plots, whereas the winter-burned averaged 6.4% in 1962 and 7.1% in 1963. On July 1, and on all subsequent sampling dates, values for winter and spring treatments were not statistically different.

On August 15, herbage on summer-burned range contained 9.7% protein, or about twice the average of earlier treatments. Thereafter, the protein content on the summer burn diminished sharply; in November, it was not significantly higher than on winter or spring burns.

Because summer fire was evaluated during only 1 year, its effects on protein content were difficult to assess. Drought during the month after burning may have influenced results. Indications are, however, that summer-burned range will supply adequate protein in late summer when grass on earlier burns averages considerably less than 8%—the minimum required by dry cows (Duncan and Epps, 1958).

In addition to improving protein content during the 30 days after treatment, summer fire increased this nutrient in undisturbed mature vegetation. Herbage collected in February 1963 from plots burned during the previous July averaged 3.8% protein—significantly more than the 2.4 and 2.6% values for winter and spring treatments.

Phosphorus Content.—Phosphorus content was improved by late burning in 1962 but not in 1963 (Fig. 1). June 1962 samples from spring-burned plots averaged 0.13% phosphorus, compared with 0.10% on winter-burned plots. Thereafter, values for the two treatments were similar. A month after summer fire, herbage averaged 0.16% phosphorus—significantly more than the 0.11% on winter and spring burns. By November, phosphorus on summer burns dropped to 0.13%, and treatment differences were not significant. In February 1963, undisturbed herbage on plots burned the previous summer averaged 0.13% phosphorus; both the winter and spring burns averaged 0.12%.

Phosphorus content was unaffected by date of burning in 1963.

At no time during the study did the phosphorus content reach 0.18%, the minimum required by cows nursing calves (Duncan and Epps, 1958).

Herbage Yield.—Even though 650 lb/acre of new herbage was destroyed by the May fire (Table 1), post-treatment yields on spring-burned plots were not significantly less than on winter-burned plots in either year. Total production—combined pre- and post-treatment yields—was significantly greater on spring-burned than on winter-burned range in 1963.

Herbage produced after summer fire averaged 382 lb/acre, substantially less than post-treatment yields on winter- or spring-burned range. Relatively low yield after summer fire was expected; Cassady (1953) reported that, on plots harvested periodically, about 80% of the

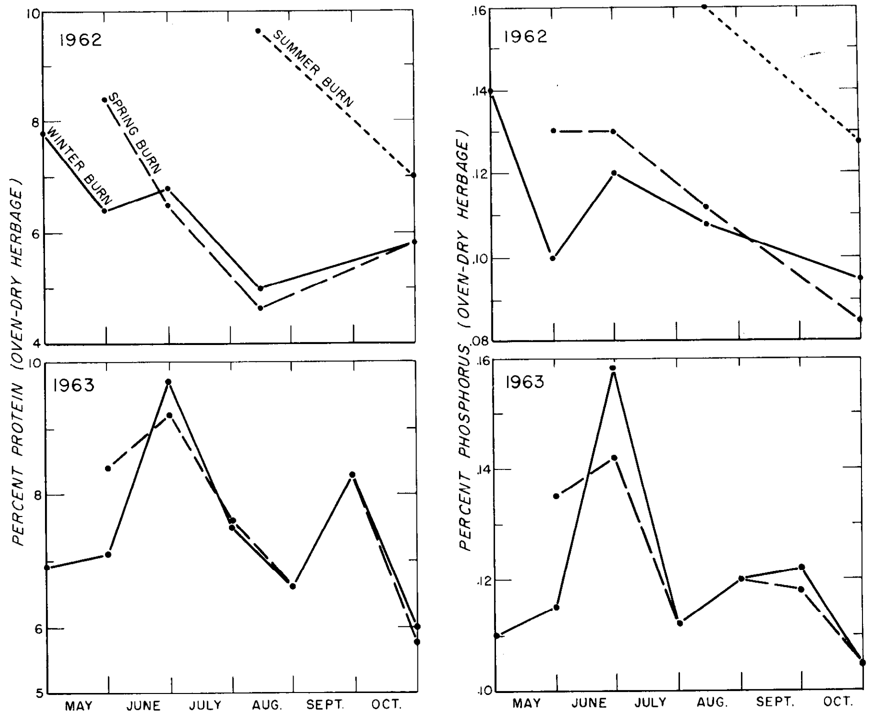

FIG. 1. Nutrient content of herbage after burns.

herbage was produced by mid-July. With pre-burn yield included, total herbage on the summer burn was significantly higher than that on the two earlier burns.

Conclusions

Burning different parts of a range unit at intervals from late winter until midsummer appears to provide herbage of relatively high quality during most of the growing season. A combination of winter and spring fires looks particularly promising. Burning in spring materially improved protein content in June without loss of yield. Further study is needed to fully evaluate effects of summer fire, but 1-year findings indicate that range burned in mid-July will yield substantial quantities of high-protein herbage.

Burning in midsummer and deferring use until after growth ceases could improve winter forage. Mature herbage on summer-burned range, though deficient in protein, contains substantially more than herbage on winter or spring burns. Cattle would require supplemental phosphorus all year, and protein supplements during winter, regardless of burning treatment. Cattle grazing summer-burned range would require appreciably less supplemental protein, however, than those on range burned earlier.

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Table 1. Herbage yields on plots burned in winter, spring, and summer (in lb/acre, oven-dry).

	Winter burn		Spring burn		Summer burn
Yield	1962	1963	1962	1963	1962
Pre-burn	——	——	412	887	1365
Post-burn	1226	1526	1000	1070	382
Total	1226	1526	1412	1957	1747

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