

Cattle Production on a Southern Pine-Hardwood Forest

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Range management research in the South has been limited primarily to the longleaf-slash pine (*Pinus palustris*-*P. elliottii*)-bluestem (*Andropogon* spp.) range type. Little investigation has been conducted in the loblolly-shortleaf pine (*P. taeda*-*P. echinata*)-hardwood type, which occupies approximately 70 million acres from Virginia to eastern Texas. Although this type is managed principally for timber and produces relatively little herbage, it is grazed extensively by livestock. In 1966 a study was initiated in a loblolly-shortleaf pine-hardwood stand to evaluate a management program combining livestock and range practices proven successful on longleaf pine-bluestem range. These practices included prescribed winter burning, supplemental winter feeding, and regulated seasonal cattle breeding.

This paper reports on forage production and utilization, cattle weights, calf crops, and costs and returns from 1969 to 1976.

The Study

The study was conducted on 2,100 acres of National Forest land 30 miles north of Alexandria, in central Louisiana. This area of level to gently rolling terrain has an elevation of 120 to 200 feet, and receives an average rainfall of 54 inches. A 1967 timber survey revealed an average of 162 pines and 548 hardwood stems per acre, for a combined basal area of approximately 120 square feet per acre. Understory shrubs and hardwoods provide abundant browse. Herbaceous grass forage consists primarily of longleaf uniola (*Uniola sessiliflora*), spike uniola (*U. laxa*), panicums (*Panicum* spp.), and bluestems (*Andropogon* spp.).

The area had not been prescribe-burned prior to this investigation. But since the value of prescribed winter burning has been shown in the longleaf-slash pine type (Duvall and Whitaker 1964), winter burning was initiated in 1967 to determine its benefits in loblolly-shortleaf pine-hardwood stands. One-fourth of the area was maintained as an unburned check; one-third of the remaining area was burned during February and March each year on a 3-year rotation. Each designated area was burned twice.

From 1966 to 1969, upland hardwoods on 700 acres were reduced to between 5 and 20 square feet of basal area per acre.

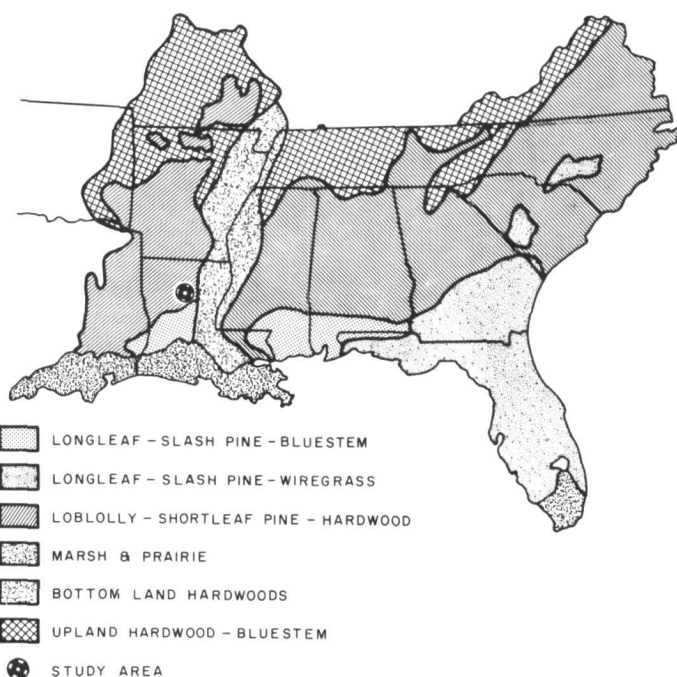
Unrestricted grazing before this study had apparently resulted in moderate to heavy utilization of the area. From 1966 to 1968, cattle were removed, and in May 1968, the area was stocked with 15 two-year-old Brahman crossbred heifers. Beginning

February 15 through May, 1969, and each year thereafter, the heifers were bred to a purebred Charolais bull. Calving occurred from November to March. Regulated breeding allowed cows and calves to take advantage of higher quality spring forage.

To alleviate forage nutritional deficiencies, each cow was supplemented with approximately 425 pounds of cottonseed cake between November 1 and May 31, and about 900 pounds of bahia grass (*Paspalum notatum*) hay between December 1 and March 10. Supplement was provided three times a week. Steamed bonemeal and salt were provided free-choice year-round.

Findings

Herbage and browse averaged 118 and 38 lb/acre (oven dry weight), respectively. Longleaf and spike uniola produced about 45% of the herbage. Both grasses are shade tolerant and remain green during winter. Panicums, forbs, grasslikes, and bluestems



Range types of the South (Byrd and Lewis 1976).

produced most of the remaining herbage. Blueberries (*Vaccinium* spp.) and greenbriers (*Smilax* spp.) were the most important browse species. Cattle and wildlife used an average of 58% of the herbage and 33% of the browse.

Prescribe-burned areas produced 175 pounds of herbage and 45 of browse per acre on hardwood treated areas and 90 pounds of herbage and 25 pounds of browse where hardwoods were not treated. Unburned areas averaged 190 pounds of herbage and 35 pounds of browse per acre on hardwood treated areas and 75 pounds of herbage and 20 pounds of browse per acre where hardwoods were not treated.

Prolific sprouting occurred where hardwoods were top-killed by burning, but fuel levels and drying conditions were generally not favorable for reducing hardwoods. Burning at other seasons or frequencies, or both, may produce more desirable results, but additional research is needed to determine these guidelines.

Calf weaning weights averaged 439 pounds at 194 days of age, and ranged from 356 to 519 pounds. Calf crops averaged

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71%, varying from 92% during the first year to 23% during the second year. During the last 5 years of the study, calf crops averaged 77%, which is similar to previous studies on longleaf pine-bluestem range.

One cow was shot during hunting season, and two cows died during or shortly after calving. Two cows were culled from the herd because they missed breeding two consecutive seasons. Since none of these cows were replaced, the herd averaged 13 brood cows during the 7 years and was down to 10 the last year.

November through April weight loss by cows averaged 24 pounds, including losses associated with calving. These losses were much lower than a previous study found (Duvall and Hansard 1967). However, we provided our cows about four times more hay than the earlier researchers gave theirs. Cottonseed cake supplements were about the same in both studies. Winter supplies of green herbage and high shrub availability may also have partially contributed to the differences in weight loss.

Calves were sold directly off the cows at about 6½ months for an average of \$152.86, with variations between \$105.31 and \$244. Calves generally graded good to choice. Gross returns per cow averaged \$98.08 for the entire study. Yearly expenditures per cow averaged \$47.48 for supplemental cottonseed cake (\$27.96), hay (\$15.14), salt and bonemeal (\$0.55), grazing fees (\$1.20), and bull feed during the breeding season (\$2.63). These costs varied from about \$36 to \$64. Most of the cost variation occurred in the cottonseed cake, which went from \$19 to \$40 per cow although similar amounts were fed each year. Hay costs varied from \$13 to \$20 per cow. Net returns per cow averaged \$50.61 and varied from a loss of \$5.43 with the 23% calf crop to a profit of \$116.

Ninety-two percent of the calves were born between December and late February. Since all calves were sold at the same

time, the older ones were heavier and usually brought higher returns than younger, lighter calves. Total calf returns could have been increased somewhat if younger calves had been sold later at heavier weights; however, this might have influenced subsequent calf crops.

Discussion and Recommendations

Management can produce large, high quality calves on loblolly-shortleaf pine-hardwood sites, but the present livestock carrying capacity of this and similar stands is not sufficient to sustain profitable livestock operations. The range potentials of these sites, however, are not being realized under dense multi-layered pine-hardwood stands. For example, herbage and browse averaged about 800 and 250 pounds per acre, respectively, on ungrazed plots within this study area where basal area had been reduced to 96 square feet per acre, but prescribed winter burning at 3-year intervals was not adequate to control hardwoods that sprouted following thinning (Wolters, unpublished data). Without subsequent management, herbage and browse will be rapidly reduced by development of a dense midstory of hardwoods and tall shrubs.

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