RABBITS AS A TOOL IN PASTURE AND RANGE UTILIZATION RESEARCH

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Many workers have pointed out the disadvantage of simulating grazing by clipping. Perhaps the greatest objection to clipping as compared to animal grazing was reported by Crider (1955) who found parts of a bunchgrass plant to function independently so far as the effects of foliage removal on root growth were concerned. In his opinion, the habit of cattle grazing only part of a plant seems desirable.

However, there are two important problems in using large animals. The first is the fact that the grazing enclosure used needs to be large enough to supply forage for a minimum of two or more animals. The second is that with larger enclosures variability increases which in turn requires a larger area or more replication of pastures. In order to overcome both of these difficulties the experimenter must increase the cost of his studies. Whenever a treatment has been sufficiently well tested on a plot basis, naturally a large grazing experiment is desirable for final evaluation or demonstration. In the screening process, however, there is a need for techniques to be used in simulating effects of large animals on small uniform areas.

Rabbits were used at the Oregon Agricultural Experiment Station in 1955 in an attempt to test the effectiveness of spring-applied nitrogen fertilizer to increase forage production during the sheep breeding season in August. Fertilizer treatments consisted of a March application of 33 lbs. of nitrogen per acre to a mixed stand of Alta fescue (*Festuca arundinacea*), orchardgrass (*Dactylis glomerata*), and burnet (*Sanguisorba minor*). The fescue made up about 45 percent of the stand, orchardgrass 15, burnet 20, and other species 20 percent.

Since clipping experiments had been conducted over a two-year period to determine the best method of treating this type of pasture, it was thought that rabbits might be useful in making an animal evaluation. Forty weaner New Zealand rabbits, about six-weeks old and weighing approximately 1,200 grams each, were used on the fertilized and unfertilized plots. Each plot was six-hundredths of an acre in size. These two fertilizer treatments were applied in four replications making a total of eight plots in the experiment. Late in July the weaner rabbits were grazed in groups of twenty on each of the two treatments.

Groups were weighed four times weekly and moved to the corresponding treatment in the next replication at the end of each week. Fourteen separate weighings were made during the course of the experiment which lasted 28 days.

Utilization checks were made by clipping 30 randomly located

square-foot quadrats in each plot immediately before and after grazing. Utilization figures varied from none the first week of the study when grazing by rabbits was balanced by forage growth to 50 percent in the unfertilized plots in the fourth replication. No significant differences in rabbit gains were observed among the treatment groups. It is believed that the intensity of rabbit grazing was too low to be reflected in their gains. In other words, in all treatments the rabbits were receiving sufficient forage to maintain a near-normal gain.

A range of use levels was obtained, however, on the four replicates in both the fertilized and unfertilized plots. These were correlated with early spring production in April of 1956, and a close inverse relationship was found to exist between the intensity of August grazing and early spring production the following year. These data are summarized in Table 1.

Unintentionally a range of use was obtained with rabbit grazing which confirmed a relationship demonstrated earlier by clipping studies. In addition to these indications obtained from rabbit use ranging from 0 to 50 percent, extreme use by sheep outside the experiment on an unfertilized area (90-100 percent utilization fall 1955) resulted in zero forage production on April 16 the following spring.

Table 1. Effect of intensity of rabbit grazing in August on early spring forage production the following year.

Percent Utilization (August 1955)	Production of Air-Dry Forage on April 16, 1956	
	Unfertilized	Fertilized (30 lbs. N, March, 1955)
	lbs./acre	lbs./acre
0	240	380
10	220	
15		400
30	100	
30		340
40		290
50	110	
Means	170	350

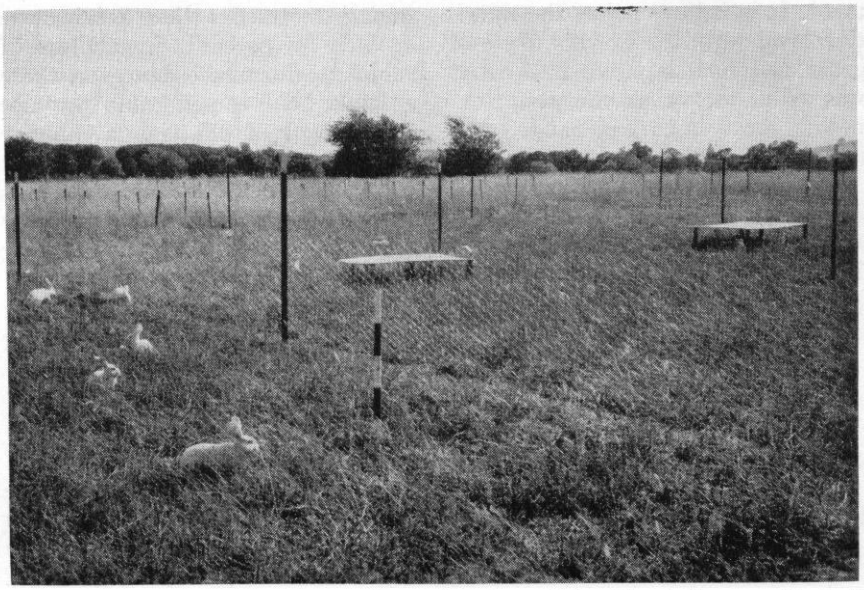

FIGURE 1. Rabbits grazing on experimental pasture plots. The shelters provide both shade and protection from predatory hawks.

These data suggest the value of rabbits in applying grazing treatments to small plots so that effects can be studied over a wider range of use than would be possible with large animals alone. Perhaps preliminary results from similar trials would become valuable in planning large experiments where, of necessity, the number of grazing intensities would be limited.

In Figure 1 the rabbits are shown grazing during the experiment reported. The outside of the experimental area was fenced with heavy six-foot woven wire used by turkey men for protection against dogs and foxes. Burrowing under the fence was prevented by plowing out a furrow slice around the area and burying 12-inch poultry netting with 1-inch mesh. Divisions between plots within the area were made with 2-inch mesh light-weight poultry netting 48 inches high. The bottom 12 inches of this division wire was turned into the plot and secured to the sod with 3-inch staples. This left the vertical segment 36 inches high which was sufficient to prevent rabbits from jumping between exclosures and still allowed free access by the attendant.

At the four corners of the main area, number one jump traps were placed on the top of 10-foot, 2 x 4-inch posts to guard against owls. To protect the rabbits from depredation by hawks and to supply necessary shade during the hot part of the day, 4 x 4-foot panels of ¼-inch plywood were supported in a horizontal position by five 1-foot x 2-inch surveyor's stakes. This kept the shelter about 10 inches above the ground and was sufficiently large for ten weaner rabbits. No losses occurred from predation and no difficulty was experienced from dietary deficiency. A constant supply of fresh water was provided in 10-quart poultry self-waterers. During the transition to pasture forage a small amount of supplement was provided in small galvanized troughs secured to the partition fence.

A total of four rabbits was lost during the study. Three died of acute bloat the first day on pasture and were replaced by excess animals from a pool kept for that purpose. This loss could have been avoided by providing them with green grass while the rabbits were still on dry feed. One rabbit became ill the last week on pasture from dysentery and was killed as the animals came off the experi-

ment. It is believed that the nutritive level supplied by this dryland grass and forb mixture in August was about as low as one would expect in most pasture or range grazing experiments.

The rabbits gained an average of 300 to 400 grams in the four weeks. This was at a nearly linear rate of 75 to 100 grams per week. These gains should be large enough to measure significant differences among treatments when grazing use exceeds 50 percent. Regardless of rabbit performance, however, these animals hold considerable promise as a means of effecting a number of levels of utilization in grazing experiments. In addition, rabbits leave pastures in a more normally grazed condition than clipping does.

Although one may reasonably question the value of simulating trampling effects with rabbits, this problem is greater with clipping. In fact, on the dry pastures in this experiment there were noticeable trails and evidence of surface trampling wherever the rabbits congregated.

LITERATURE CITED

CRIDER, FRANKLIN J. 1955. Root-growth stoppage. U. S. Dept. Agr. Tech. Bull. 1102:1-23.