Seasonal Versus Continuous Grazing on Annual Vegetation of Northern California

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Jared Smith, writing for the 1895 USDA Yearbook of Agriculture, was the first to suggest seasonal grazing plans on rangeland. He advocated rotational grazing as one means of improving range conditions in the Southern Great Plains. The rationale for such seasonal grazing was that many world grasslands evolved under intermittent grazing pressure from migrating herbivores. Animals such as bison in North America and wildebeest in East Africa, used a given range during a short period, perhaps overused it, then moved to a new range in a pattern that more or less repeated itself yearly. Migrations became fixed in the behavior of many animal species, which subsequently exerted seasonal grazing pressures to which vegetation became adapted through natural selection. Seasonal grazing plans developed as range managers attempted to fit domestic animal species into naturally evolved plant and animal communities. The belief was that range productivity could be increased and damage decreased if grazing patterns were as near as possible to those under which the vegetation evolved.

Almost no information is available on the effect of seasonal grazing use on annual vegetation in California when other factors such as stocking rate and improvement factors are held constant. Nonetheless, a commonly heard suggestion is to concentrate grazing animals in the early spring to discourage the undesirable annuals and to encourage the more desirable species. Therefore, a study was conducted at the Hopland Field Station in Mendocino County, California, which is located in the central portion of the northcoast mountain ranges, to test the relative effects of continuous versus repeated seasonal grazing.

Beginning in the 1965-1966 grazing season, 3 pastures, enclosing approximately 15 acres (6 ha) each, were grazed by sheep on a seasonal basis during the months of March, April, and May, respectively. Seasonal grazing in the pastures was repeated during the same month in all 3 years of the study, which terminated in 1968. Gates between the pastures were opened on the first of June each year to permit free animal access to all the pastures from the beginning of the dry period until March 1. During the same spring period of rapid plant growth, March–May, another pasture encompassing approximately 37 acres (15 ha), was grazed continuously from March throughout the dry summer months. Stocking rates in each of these grazing trials had been previously adjusted to equalize (1) lamb weights at 120 days of age, and (2) equal ewe weight loss at the end of the dry period.

Results

Continuous and repeated seasonal grazing produced similar patterns in foliage cover, standing crop, and botanical composition measured in ungrazed vegetation at the end of each growing season. June cover in those pastures grazed on a repeated seasonal basis showed the same yearly differences as cover in the pasture grazed continuously. Total standing crop in June also responded similarly to both kinds of grazing treatments over the 3-year period.

Pasture S-6, grazed heavily in April, has the appearance of ungrazed grassland in June, when this photo was taken.

Similar trends in cover and standing crop for continuous and repeated seasonal grazing reflected similar botanical composition among all pastures, regardless of grazing treatment. The relative proportions of desirable annual plants such as soft chess (*Bromus mollis*), wild oats (*Avena barbata*), filaree (*Erodium* spp.), and clovers (*Trifolium* spp.) were remarkably alike under both grazing treatments. The same results of similar botanical composition also occurred for undesirable annual plants such as silver hairgrass (*Aira caryophyllea*), ripgut (*Bromus rigidus*), and goldfields (*Baeria chrysostoma*).

Although temporary seasonal differences in botanical composition, standing crop, and cover may have existed among the 3 pastures grazed during March, April, and May, the significant overall conclusion demonstrated by this study is that an annual grassland, divided into 3 pastures grazed seasonally, responded identically to an undivided annual grassland grazed continuously. Moreover, ewe performance and lamb weaning weights in the pasture with yearlong-continuous grazing were consistently better than animal performance in the pastures grazed on a seasonal basis.

Similar conclusions were also reached at the Hopland Field Station from studies investigating the impact of different grazing intensities on annual vegetation. Four pastures grazed at

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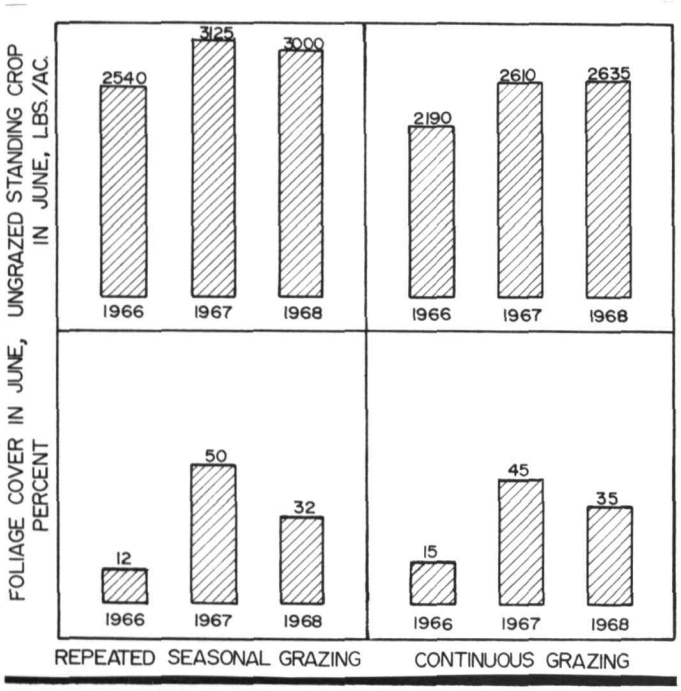

Ungrazed standing crop and foliage cover in June of 3 years. Pastures were grazed during the same 1-month period each growing season or continuously.

moderate, 1½, 2, and 2½ times the moderate stocking rate all exhibited identical trends in cover and botanical composition, regardless of grazing intensity. Only the pasture grazed at the heaviest stocking rate displayed any reduction in productivity during the study, and even this decline disappeared soon after normal stocking rates were resumed.

Changes in productivity and botanical composition of annual vegetation are determined primarily by annual weather patterns. These patterns, particularly total precipitation, caused the similar trends in cover and standing crop for both the continuous and repeated seasonal grazing treatments. The absolute differences in standing crop between the units grazed continuously and seasonally reflected natural pasture differences, and were not produced by the grazing treatments. Although seasonal grazing systems can produce rapid changes in forage production, this change persists only so long as the grazing treatments continue. Since there is a new generation of annual plants from seed each year, no possibility exists for plants to develop vigor that carries over from one year to the next. Moreover, within the annual type, the desirable and undesirable species mature throughout the spring season, and grazing to reduce one plant group while favoring another is difficult on a permanent basis. This fact, combined with better animal productivity under continuous grazing, suggests that repeated seasonal grazing systems in California annual grasslands may not provide enough benefits to warrant the time and expense required to establish and maintain these grazing systems.