Why Proper Grazing Use?

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Highlight

Proper grazing use is paramount in attaining efficiency of rangeland production. Numerous scientific studies provide the basic reasons for practicing proper use. Results of grazing intensity studies are being reported from the West. The reasons for proper grazing use are emphasized. The benefits are enumerated.

From a range management standpoint, the problems involved in improving rangeland efficiency primarily center around two points: (1) Producing more good quality forage per acre, and (2) doing a better job of properly harvesting the forage crop. Solutions to these two points certainly are not always simple. They can be complex, difficult, time-consuming and costly. But this can be said about almost any effort to increase efficiency.

Proper grazing use is the most important and usually the least expensive way to achieve more forage production on rangeland. Proper grazing use by itself will improve and maintain forage production on ranges now producing below optimum. Without proper grazing use, the beneficial effects from almost any other measure can be nullified or reduced in effectiveness.

Proper grazing use is defined by the American Society of Range Management in its Glossary of Terms Used in Range Management as "The degree and time of use of current year's growth which, if continued, will either maintain or improve the range condition consistent with conservation of other natural resources." It can also be defined as "grazing at an intensity which will maintain adequate cover for soil protection and conservation of other resources and maintain or improve the quantity and quality of desirable vegetation."

Plants, as well as animals, have certain requirements for their health and growth which must be taken into account. These requirements need to be known for key forage species which may be grasses, forbs, and/or shrubs depending upon class of grazing animal, season of use, composition of the vegetation, and other factors. The safe degree of use that can be made of key species usually varies according to whether grazing occurs during the growing season, after maturity, during dormancy, or combinations of seasons. Safe degree of use usually varies for different key forage species. It is generally thought that a greater degree of use can be made after maturity than during the growing season of key species without harming the vegetation. Other resource factors, such as a soil that is unstable when dry, need to be given careful consideration, however. Safe degree of use for key forage species according to range site, class of grazing animal, and season of use need to be worked out.

FIG. 1. Bluebunch wheatgrass, *Agropyron spicatum* (Pursh) ungrazed (top), properly grazed (center) and overgrazed (bottom) by cattle when grazing occurs during the growing season. Stubble height measured by 6-inch scale. Note bare soil and sparse mulch in over-used area.

Some of the more important facts about grasses which are supported by scientific studies are reviewed briefly because grasses are key forage species on most ranges.

Plant Food

Plant food is manufactured in the leaves. When the leaves of a grass are grazed off during the growing season, the food manufacturing process is reduced. Excessive grazing during the growing season can almost eliminate the manufacturing of plant food which, in turn, seriously restricts growth. Leaving a stubble of green leaves to function during the growing season helps promote production of foliage.

Food Storage

1. Grasses store food over their dormant season (McIlvanie, 1942). The process of storage takes place during the last few weeks of the growing season. Stored food is used by the grass when it starts to grow after a period of dormancy. If grass is continually grazed too closely during the growing season, this food storage process does not take place. Consequently, the grass plant is weakened and gets a late start in the next growing season. When this happens year after year, desirable grasses which are preferred by grazing animals are eventually replaced by unpalatable weeds and brush which are relatively more vigorous because they are not grazed very much, if at all.

2. About half of the food stored by a grass is stored in its root system. The other half is stored in the crown or lower parts of stems. Excessive grazing, therefore, physically removes a part of the grass' food reserve which it needs to begin its new growth.

3. Part of the stored plant food is used by a grass to grow new roots. This is necessary because a part of the root system dies each year. If the grass is not allowed to store food, new roots are not produced. The result is a weak root system which cannot take full advantage of available moisture and nutrients. Forage production is thus reduced.

Growth Buds

The growth buds of some grasses occur deep in the crown and even underground (Hyder and Sneva, 1963). These grasses withstand close grazing better than grasses having growth buds

above the crown where they can be removed physically by close grazing.

Root Stoppage

When green leaves are clipped from a grass, the roots stop growing (Crider, 1955). The first time the grass is clipped during the growing season, the roots stop growing for a short time (12 to 18 days). If the plant is clipped again in a few days, the duration of root stoppage increases. Every additional clipping stops root growth for a longer period of time, and the percentage of roots that stop growing varies according to the proportion of the foliage removed. It is easy to understand how repeated close grazing, which is typical under heavy stocking and season-long grazing, restricts development of the root system which, in turn, lowers forage production.

Freezing

The growing tissue of a grass exists primarily in the crown. This growing tissue can be killed by freezing when it is exposed. Leaving a stubble on the grass over winter helps mulch the crown and protects it against severe winter-kill. Closely grazed palatable bunchgrasses with their centers frozen out are common in areas where freezing occurs without adequate snow cover or mulch. Not all dead centers of bunchgrasses are due to freezing, however. It is the nature of bunchgrass growth to develop new shoots at the periphery of the bunch and sometimes the centers die, even though ungrazed.

Residue

The accumulation of plant residues around grasses has a number of beneficial effects which influence range production and health.

1. Range soils that are denuded of vegetation and without mulch are subject to frost heaving. Valuable forage plants are heaved up bodily and left sitting on pedestals of soil where their roots dry out readily and their crowns (growing tissue) are exposed to killing frosts. Not all pedestalled plants denote excessive grazing, however, because pedicelled plants commonly occur on some soils where the ungrazed plant community is in near-climax condition. Furthermore, stones in bare soils may be heaved up to the surface due to freezing and thawing. This contributes to the formation of a stone pavement which seriously restricts the establishment of forage plants. It takes very little mulch on the surface of the ground to reduce frost heaving to a minimum. The amount of mulch that can be accumulated in arid areas is limited because such organic material disappears, probably through oxidation.

2. Most rangelands are in areas of relatively low precipitation. Thus, it is all the more important to do everything possible to allow this moisture to enter the soil so it will be available for forage production. Proper degree of use and mulch contribute in several ways to increasing the effectiveness of precipitation.

a. Evaporation is caused by wind and sun. A good stubble on the grass and some mulch left on the ground reduces this loss of valuable moisture.

b. Much of the precipitation in range areas comes in the form of snow. A standing stubble has proven to be effective in keeping much of the snow moisture where it falls.

c. Bare soils in range areas commonly form a surface crust and vesicular structure when exposed to the impact of rain drops. (Hugie and Passey, 1964). Such structure greatly reduces the ability of the precipitation to enter the soil. Valuable water is lost by runoff which carries fertile topsoil with it. This reduces the productiveness of the resource, silts streams and reservoirs, and causes water pollution.

d. Grass seedlings seldom survive in bare areas because of excessive surface temperatures. Grass seedlings become firmly established primarily where mulch and plants partially shade the soil. Mulch is very important for natural revegetation to thicken the stand of desirable grasses on rangelands.

Effects on Vegetation

Proper grazing use has the following main beneficial effects on key forage species:

1. Increased or maintained vigor of both shoots and roots.
2. Increased infiltration of water for plant growth.
3. Seedling establishment and eventual thickening of the stand.

As a result of building up the health, vigor, and stand of important forage species, the following is accomplished:

1. Increased forage production.
2. Earlier spring growth and, therefore, earlier turn out date.
3. Prolonged green feed season.
4. Improved reliability of production from year to year.
5. Stabilized basic soil resource.

Research

Research stations over the West are reporting the effects of different intensities of grazing on rangelands. One of the latest reports is from Miles City, Montana (Houston 1966). The Miles City station has prairie vegetation and summer precipitation; however, the principles reported there apply to other range areas.

At the Miles City station, a 10-year study showed that heavy grazing:

1. Reduced basal cover of vegetation on summer range.
2. Reduced average height and rate of growth on two key species.
3. Reduced range condition rating or did not allow improvement.
4. Accelerated runoff and caused severe gully erosion.
5. Reduced calf crop at weaning time.
6. Reduced birth weight of calves.
7. Reduced rate of gain of calves.
8. Reduced weaning weight of calves.
9. Reduced weaning grade of calves.
10. Reduced value of calves produced per breeding cow.
11. Reduced spring and fall weights of wet and dry cows.
12. Reduced fertility of cows.

Comparable results recently were reported by Frischnecht and Harris (1968) in their excellent study of grazing systems and intensities on crested wheatgrass in Utah.

Efficiency of Rangelands

Efficiency is a prime concern in today's range livestock industry. Generally speaking, much has been done to increase the efficiency of range livestock through breeding, selection, production testing, and veterinary science. Efficiency in other components of livestock ranching such as marketing, transportation, machinery, and farm crops also has been improved significantly. Many companies and people work hard helping the livestock industry develop and perfect these efficiencies because their livelihoods depend on selling products and services to ranchers.

The story of grazing efficiency on rangeland is entirely different. Almost

no one except a few public employees and a few private consultants have sincerely pushed scientifically sound range management to achieve efficiency on the range. There are almost no special products to be bought by the rancher in order to achieve range efficiency. There are no industries which go all out to support the theme of efficient range management. There is no strong advertising program for good range management such as there is for animal-health products or machinery, for example. Yet, ranchers are faced with a serious situation of rising costs, low prices, and low returns on capital investment. They need increased efficiency in order to stay in the business.

Ranchers should look critically at their one remaining big opportunity for increased efficiency—their rangelands. Proper grazing is a paramount factor in achieving this efficiency.

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