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Designing a grazing management plan for Colorado ranches

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Quick Facts

A grazing management plan is a program of action designed to secure the best practicable use of forage resources.

Grazing management plans are important to improve or maintain range condition, improve forage harvest efficiency by livestock and optimize plant and animal performance.

A well-designed grazing management plan helps achieve grazing management goals specified by the operator, is based on and suited to the physiological and reproductive requirements of the forage plants, minimizes detrimental effects on animal performance, produces economic benefits to the operator and is practical, flexible and simple to operate.

Grazing management is the manipulation of livestock grazing to achieve a desired set of results. In rangeland situations, grazing management aims for an optimal combination of sustainable levels of range forage and livestock production. This is accomplished through a grazing management plan that is a program of action designed to secure the best practicable use of forage resources.

Planning is as important to the livestock production enterprises as it is to any other business venture. A plan must be formulated to meet both the requirements of the animal and the plants while ensuring that there is a net financial benefit to the operator. Requirements of the plant and the animal change dynamically through the seasons which imposes a need for the manager to understand these changes and their interactions to build an effective grazing management program.

Planning will improve or maintain range productivity; allow for effective and efficient use of the forage resource; provide stable and dependable livestock gains while ensuring the opportunity for profitability.

Elements

The specific details of grazing management plans will differ from ranch to ranch. Even so, all grazing management plans, no matter where they are developed and implemented, should address four basic concerns: 1) When should grazing begin during the year?; 2) How many animals will be grazed on the range?; 3) When should these animals be moved from one pasture to another?; and 4) Where will the animals be moved to? A good grazing management plan details the kind or combinations of livestock best suited to the range forage resources, the optimal stocking rate, the optimal grazing intensity, the best season of grazing, and the methods used to achieve good animal distribution over the range.

Effective grazing management plans are based on a minimum of five essential considerations. First a good plan is designed to achieve specific goals defined by the operator. These goals vary from reducing weed and poisonous plant problems to maintaining the plant communities in a desired stage of development.

Second, a good plan is based on and suited to the physiological and reproductive requirements of the forage plants. Even though grasses are well adapted to grazing, grazing does subject the plant to stress. Good planning allows control over the number of times a plant is grazed (frequency) and the amount of leaf material that remains after grazing (intensity). A well thought-out plan also allows grazed plants the opportunity to regrow with little chance of being grazed again in the

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process (physiological rest). Control of all three factors is important if plant vigor, and ultimately range health are to be maintained or improved.

Third, a good grazing management plan should minimize any detrimental impact on animal performance. Performance is determined by animal nutrition, health and genetics. Grazing management greatly influences animal nutrition and animal health. In turn, nutrition is determined by forage quantity and quality, both singly and in combination. Forage quantity refers to the amount of forage available to the grazing animal. Even though a pasture may produce several thousand pounds of plant material, that does not necessarily mean that animals have a lot to eat. Animal choices among forage plants are always made in terms of what is available when the choice is made. The choice has little to do with how many total pounds of grass per acre the land produces; rather it is based on the amount and quality of preferred forage available. Forage quality refers to the concentration of nutrients in the herbage to be consumed. Quality varies with a number of factors including plant species, growth stage, soil, climate and grazing management. A plan that provides animals with the opportunity to selectively choose what they graze will depress animal performance less than one that does not.

Fourth, the plan must produce tangible economic benefits to the producer. Control of grazing animals often requires expensive fencing and water developments that may be essential to achieve uniform livestock distribution and increased forage harvest efficiency. All costs produced by the plan must be covered by increased forage production, increased forage availability, or some form(s) of increased animal productivity.

Finally, the plan must be practical, reasonably simple and flexible enough to allow for adjustments necessary because of annual fluctuations in forage production and to allow for handling different classes of animals as needs arise.

Design and Implementation

Three factors can be manipulated to design and implement a grazing management plan: time, animal numbers and area. Time refers to the duration that animals stay on one grazing area before they are moved. To illustrate the effect of time, imagine 10 cows grazing in a 100-acre pasture. If the cattle grazed that pasture for one month, more forage is available to each animal than if they grazed in that same pasture for two months. In general, if animal number and grazing area remain constant, shortening grazing time makes more forage available to any one animal per unit of time. The opportunity for all animals to graze selectively therefore increases. Lengthening time produces the opposite effect. Time also influences the frequency and intensity of grazing by altering the opportunity for animals to graze plant regrowth or graze plants to a shorter height.

Animal number refers to the number of animals on the grazing area. Three terms are used to precisely describe animal numbers: carrying capacity, stocking rate and stocking density.

Carrying capacity: the maximum stocking rate possible without causing damage to vegetation and soil. The exact value of carrying capacity is difficult, if not impossible to determine accurately. Carrying capacity will vary from year to year with weather conditions; its actual value therefore is dictated by nature. Fortunately, it is not necessary to determine the exact value of carrying capacity to design and implement a grazing plan. An approximation will suffice.

Stocking rate is the area of land allotted to each animal for some grazing period during the year. In general, usage stocking rates specify the amount of land allotted to each animal for a specified length of time. Stocking rates are set by the operator when designing a grazing management plan. They should never exceed carrying capacity.

Stocking density is the number of animals on an area of specified size at any instant in time. It is important to understand the difference between stocking rate and stocking density. If a pasture is subdivided into 10 units and animals are allowed to graze only one of these units (or "paddocks") at a time, stocking density on any one paddock is 10 times greater than on the whole pasture. Stocking rate remains unchanged, however. Therefore, at any particular stocking rate, stocking density is increased by decreasing paddock size and decreased by increasing paddock size.

Stocking density changes the relative amount of forage on offer and increases the efficiency of forage use. It manipulates the evenness of grazing use and the diversity of plant choices. Caution must be exercised with high livestock densities when forage quantity or quality are limited. High densities during these periods cause adverse impacts on livestock productivity.

The optimal stocking rate is generally the first issue addressed in a management plan. The optimal stocking rate 1) provides a high net return per acre; 2) minimizes year-to-year variations in dollar returns; and 3) maintains or improves range condition.

In actual practice the optimum stocking rate is somewhere near a moderate level of stocking. At this level, forage demand is moderate in relation to forage supply. Further, animal performance remains high and relatively constant from light to moderate levels but above that reaches a threshold where performance declines. This extremely important relationship affects the forage plants as well as animals.

Once a moderate level of stocking is defined in relation to forage supply (this determination is made each year at a minimum), decide how to control time and manipulate grazing area in time and space to 1) maximize the animal's opportunity to select its diet; 2) control the frequency and intensity of grazing; and 3) provide plants with an opportunity to regrow after grazing.