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Managing Climatic and Financial Risk with Grazing

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Range management is more a matter of managing climatic and financial risks than maximizing forage production and harvest efficiency (Holechek). Both climatic and financial risks can be reduced and managed through proper grazing management.

Grazing management is the means by which ranch managers supervise the production and harvesting of forage plants while sustaining the productivity of the land and managing risk. Grazing management is accomplished by controlling the timing (when), intensity (how much), and frequency (how often) of grazing (Fig. 1).

Figure 1. Controlling the timing, intensity and frequency of grazing promotes healthy forage plants and better ecological functioning on ranges and pastures.

The Effects of Grazing

In its most practical sense, grazing is a tool for influencing plants, soil, energy flow, and water and nutrient cycles. Certain grazing practices can change the plant composition and health of a pasture, and this change can be positive or negative. Grazing management strategies should be designed with plant, soil and animal performance in mind. Maintaining an optimum balance between plant and animal requirements should be the primary range management goal.

Severe drought causes weakness or death of primary forage grasses. Five to 7 years are required for rangeland to recover fully after a drought. With conservative or moderate grazing, more forage is produced during drought than with heavy grazing, and the recovery period is shorter.

The effects of grazing are related to three major factors:

- **Timing**. Grazing during the dormant season is less likely to affect production the following spring than grazing during the growing season. A plant that is heavily grazed early in the growing season may not have a chance to recover if it is repeatedly grazed. Severe grazing just before seed set also can be very harmful.
- **Intensity**. The more leaf area that is removed, the more slowly a plant will recover. The amount of leaf area removed depends on grazing pressure—the number of animals, kind of animals, and length of the grazing period.
- **Frequency**. A plant grazed several times during a single season must recover each time. Plants grazed too often lose root mass, produce fewer leaves and stems, and are more susceptible to drought and other disturbances.

Managers control these factors by controlling the timing of grazing, the number of animals, and the length of the grazing period.

Livestock are selective in their choice of plants, and consume the most palatable plants and plant parts first. If the grazing period is too long, the same plants may be defoliated repeatedly. While repeated grazing of new grass shoots may provide grazing animals with the highest quality diet (a short-term goal), it may reduce forage quantity over the long term as preferred grasses decrease in number and less palatable or lower successional grasses increase. These less palatable and usually less productive grasses then become the forage base for future grazing, which reduces carrying capacity and animal performance.

The Importance of Animal Numbers

The number of animals per unit area at a given time is often called the **stocking density**. **Stocking rate** is the amount of land allotted each animal for the grazeable period of the year. **Carrying capacity** is the maximum long-term stocking rate (in all but drought years) that avoids damage to plants and soils. Determining the correct number of animals to put in a pasture is one of the most important decisions a manager makes. Wide variations in yearly and seasonal forage production mean the optimum level of stocking will vary through time. It is important to understand the average stocking rate that should be applied, and to be able to adjust stocking rate for the current year's forage growth. That is the way to stock the largest number of animals without harming the land.

The goal of grazing management should be to maintain "moderate" use of the forage base. Moderate use means leaving an adequate amount of forage ungrazed so that

plants can recover. The short-term stocking rate may be higher than the long-term carrying capacity. If the year-long carrying capacity is used as the stocking rate, forage may be underused in wet years and overused in very dry years. If the goal is to improve the range, leaving excess grass in a wet year will accelerate the process. Range is not improved in drought years no matter what is done. However, moderately grazed rangelands remain in better condition during drought than those that are heavily grazed. A base herd of 65 to 75 percent of carrying capacity will match stocking rates more closely with forage availability during dry years.

Grazing distribution is also a major concern. Livestock do not graze at random; they choose preferred sites and plants, which leads to patch grazing. The management goal is to have cattle graze as much of a pasture or ranch as they safely can.

The Principle of Rest and Graze

Grazing systems help control the intensity and frequency of grazing by controlling the amount of time livestock are on a pasture. However, stocking rate has a far more important effect on animal performance and on plant species composition in a pasture than any grazing system. It matters less whether all livestock are moved around from one pasture to another, or whether the same number of cattle are spread out over the whole area to be grazed and left all of the time. What does matter is that forage demand is adjusted to the amount of consumable forage in the pasture. If this adjustment is not made, the land is likely to be overgrazed.

One part of a grazing strategy is deciding when and for how long a pasture will be grazed, and when and for how long it will be rested. The rest and graze periods can be short or long, depending on the goals for plants and animals. From the standpoint of the range vegetation, there is a minimum rest period that will allow for plant improvement and a maximum grazing period that will avoid repeat defoliation. From the standpoint of the livestock, there is a maximum rest period that will prevent forage quality from declining and a minimum rest period that will allow adequate forage to accumulate. Rest/graze periods are thus based upon forage growth rates. When developing a rest/graze plan, consider the primary periods of forage growth and the length of deferment needed for key forage species to grow and reproduce. An improperly designed program causes imbalances between forage demand and supply, which may cause animal performance to suffer.

Strategies for Survival

Managers should know the minimum amount of forage to leave in a pasture to meet goals for water and nutrient cycling, future forage production, and root development. The amount of forage to be left ungrazed will depend on the type of forage plants desired, the manager's goals for improving the range, and the amount of risk the manager wants to assume. The recommended minimum amount of standing crop to be left ungrazed at all times is:

- 300 to 500 pounds per acre for shortgrass pastures,
- 750 to 1,000 pounds per acre for midgrasses, and
- 1,200 to 1,500 pounds per acre for tallgrass pastures.

These are the threshold levels for forage residue. The amount of forage above threshold residue levels required for further grazing can be calculated (see Extension publications E-127 and E-128).

The key to long-term financial success is to balance stocking rates with available forage, use moderate stocking rates, develop a graze/rest system, and monitor plant growth so that changes can be made when the residue threshold is reached.

Other Extension Publications

L-5141, "Do you have enough forage?"
B-1646, "How much forage do you have?"
E-127, "Managing Residual Forage for Rangeland Health"
E-128, "Using Forage Harvest Efficiency to Determine Stocking Rate"
L-5409, "Grazing Distribution: Considerations and Management"

For Further Reading

Holechek, J. L. 1996. Drought in New Mexico: prospects and management. *Rangelands* 18:225- 227.

Molinar, F., D. Galt and J. Holechek. 2001. Managing for mulch. *Rangelands*. 23:3-7.

For additional range management information see: http://texnat.tamu.edu

For additional risk management information see: http://trmep.tamu

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