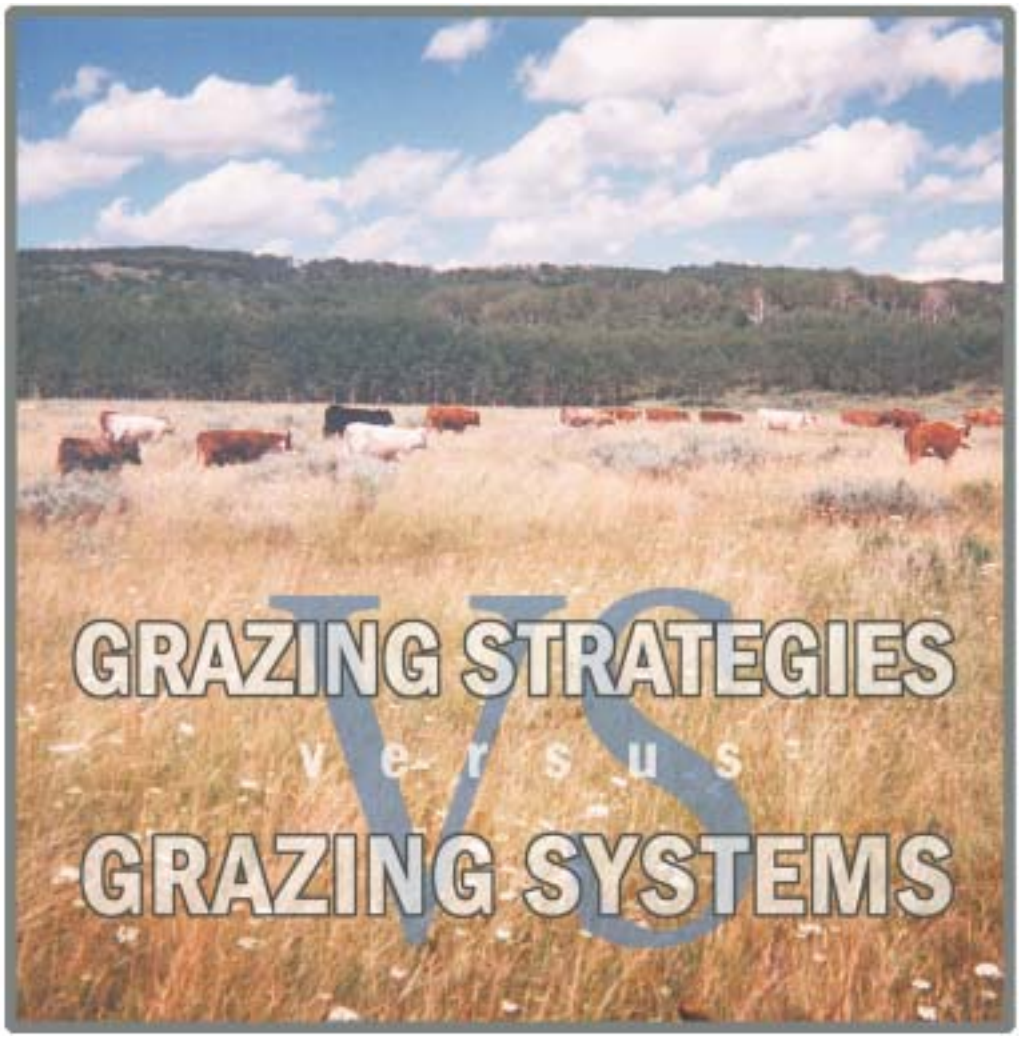

DOUG REYNOLDS, UNIVERSITY EXTENSION EDUCATOR

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Editor: Hattie Penny, College of Agriculture, Office of Communications and Technology
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A grazing system, as defined by the Society for Range Management (SRM), is a specialized form of management that employs alternate periods of grazing, deferment, and rest. These periods may rotate among pastures during a single season or extend to successive years. The SRM put it simply in a publication for the U.S. Environmental Protection Agency (EPA): "Divide your grazing land into several pastures, and then choose the best time for grazing each one." For this to be successful, a manager must accept that the best time for each pasture cannot be held constant according to a plan generated on paper. Such a plan is only a best guess based on ideal and predictable conditions. Nature dictates each year's scheme, the period of use, and length of grazing exposure. An effective grazing plan demands flexibility and often requires the ability to change horses in the middle of the stream. This approach to grazing can be more correctly termed a grazing strategy, rather than a grazing system.

Specialized grazing systems abound worldwide, but may not be adapted to different habitats or climates, or to the ranchers who decide to implement them. A well known example is the Hormay System, which includes not only season-long rest, but deferment from grazing during the early season. The Hormay System was widely adopted by the U.S. Forest Service, the Bureau of Land Management, and various agencies dealing with private land. It was developed for Idaho fescue-dominated ranges, but was, unfortunately, applied inappropriately to other types of vegetation without success. The Hormay System is just one of many grazing systems that includes periods of deferment and / or rest. In reference to their primary purpose, these systems can be grouped as rest-rotation, deferred rotation, or combinations. Any manager who has a good feel for the productivity of the land and associated limitations can design and name his or her own grazing system. But unless the manager assumes from the start that the system (or strategy) is imperfect and carefully monitors both forage and cattle performance, the results will be disappointing or even damaging.

Grazing systems designed by professional land managers for individual properties range from simple two-pasture rotations in which early season use is switched annually to more complicated schemes involving several pastures. The purpose of all, however, is to replace continuous season-long grazing with a plan that allows certain areas to be rested during critical times of plant growth (Figure 1).

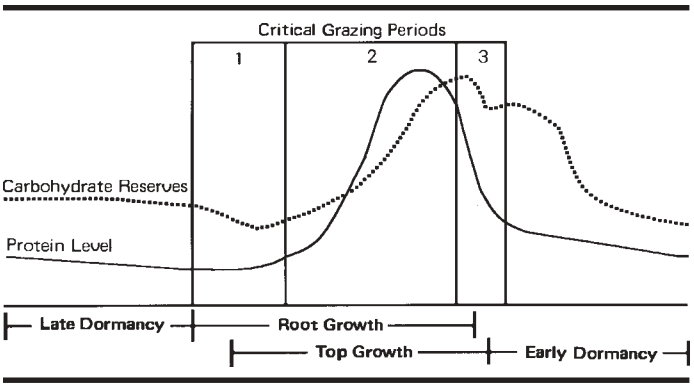

Figure 1. Changes in protein and carbohydrate with annual plant growth of bunchgrass, related to critical grazing periods.

The rotation of time of use among pastures provides plants a rest from being grazed at the same time every year.

In areas where the growing season is sufficiently long and precipitation sufficiently reliable, regrowth will occur after grazing. Under season-long grazing, grass with regrowth is tender and palatable and will be regrazed. The period between grazing is never long enough for the plant to recover its carbohydrate reserves, which are stored in the stems, stem bases, and rhizomes, rather than in the roots. This scenario will affect plant vigor, especially in those species preferred by cattle. Herein lie additional reasons for the rest periods in systems that graze pastures more than once. Specialized systems seldom increase short-term cattle performance over continuous grazing. However, strategies that improve vegetation condition and production should increase total animal yields over the long term.

Cattle performance in late summer and fall is affected by forage protein and mineral values, but the most limiting factor is energy. A grazing strategy that provides adequate forage into the fall will enhance performance. Residual forage is the key factor in determining when to move cattle or begin supplementation. Monitoring records that direct these decisions are also important in meeting water quality requirements.

Table 1. Simple four-pasture system (pastures are identified: A, B. C, and D).

Use Dates	Year 1	Year 2	Year 3	Year 4
15 May - 10 June	A	B	C	D
11 June - 16 July	B	C	D	A
17 July - 26 August	C	D	A	B
27 August - 2 October	D	A	B	C

As summarized in Table 1, the pastures are simply rotated for early-season use over a four-year period. If the rotation dates are permanently established on implementation of the system, results may be minimal or non-existent with respect to either range improvement or cattle performance. The manager must be alert to uncontrollable elements such as cool springs, dry summers, and other factors. What if a wildfire burns up a pasture? Does the manager have a backup plan? Perhaps there should be a pasture E for dormant season (fall) grazing, or a reserve set aside in case of drought. Keep in mind, however, that forage quality will be low in non-use areas and also that these areas will be more susceptible to fires.

In this four-pasture system, the grazing periods range from 27 days early in the sea-

Winter feed on the Deseret Ranch.

son to 37 days later in the season. If regrowth occurs during the growing season, the grazing exposure time is probably too long to prevent overgrazing. Overgrazing, in this sense, refers to frequency, rather than resulting grass length. Cattle control how short the forage is grazed; the manager controls how often. But variations in soil type, degree of slope, and direction can cause certain areas to be preferred by cattle and thus subject to being overgrazed (plants rebitten). In order to provide for more rest between the intervals of exposure to grazing, the manager may decide to divide certain pastures again. But there is a ceiling on the number of divisions as far as plant health and productivity are concerned. Fencing and water developments cost money. Managers must ask themselves if they can really justify a large investment in these developments for what might be an almost immeasurable improvement in rangeland health. Perhaps leasing additional pasture would be an alternative, but this should be implemented on a long-term agreement so that it can be included in the manager's grazing strategy.

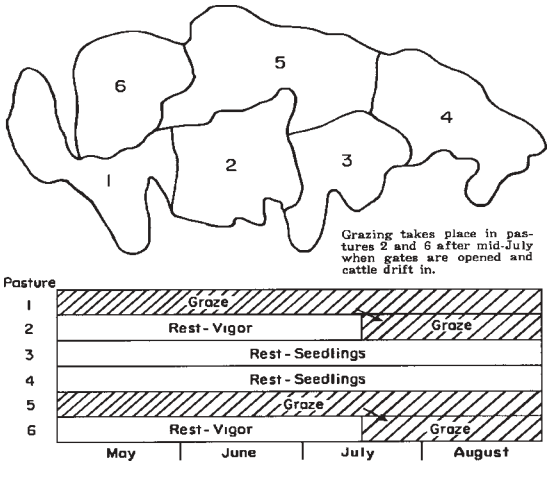

Figure 2.

Winter feeding is expensive.

The second example of a specialized system is more complicated, as it includes total season-long rest in addition to deferment until seed ripening (Figure 2).

Range managers have long advised deferment of selected areas for reasons of plant reproduction by seed. There is no evidence for the assumption that this is a viable method of reproduction and, in fact, good evidence that it only occurs under rare conditions. The originator of this system must have suspected this, as the plan calls for heavy late-season use in order to plant the seeds. Just how cattle density would be increased in order for this planting by hoof action to have any measurable effect is not explained. A longer grazing period without cattle concentration and milling will not do it. The most common places to observe seedlings are around posts, water tanks, or other places where cattle congregate and create seed beds.

For reasons of simplicity, both of these examples assume that pasture sizes are nearly equal. This is seldom the case, as pasture divisions vary with topography, ease of fencing, or legal restrictions.

In the rest and deferment system (Figure 2), the early use pastures (treatments 1 and

Expected production can be estimated by building medium-size enclosures and observing what is left after grazing. If too much grass is gone, the stocking rate is too heavy.

5) are grazed until seed ripening in numbers 2 and 6. In situations where pasture sizes vary, it is probable that there will be heavier-than-planned-for use in smaller pastures and spotty use in larger ones. If the season is late and seed ripening is delayed, then regrowth may occur with danger of repeated grazing of recovering plants. Regrowth in high and / or drier sites may be minimal or non-existent, but will vary in other sites. Managers should monitor the situation and avoid letting seed ripening or calendar dates prevent them from reaching grazing objectives. This means employing a grazing strategy in lieu of a system.

Many research studies have sought to identify a system that produces positive effects on range health, productivity, and cattle performance. Results show system ratings ranging from highly successful to totally unsuccessful. How can a rancher or land manager select a system with any faith that it will work when any one of the specialized systems has likely been assigned both ratings? Actually, very few systems have shown much advantage over continuous grazing, especially with regard to animal performance. One researcher reviewed 62 grazing systems studies and concluded that claims made by their originators were extravagant and unsubstantiated.

What are the reasons for these research inconsistences? Answers surface when these studies are scrutinized.

- Grazing and rest periods were too rigid.
- Pastures were too small.
- Duration of the studies was too short.
- Stocking rates were too low.
- Research assumptions concerning plant vigor and carbohydrate reserves were unsound.

When short-duration, high-intensity grazing was first implemented by ranchers, several research stations designed studies to test its validity. At the outset, this type of grazing was referred to as the Savory Method. The research appears to be based largely on bias. Those livestock growers who were successfully using the strategy reacted by dropping the above name and substituting the term planned grazing. This approach requires many inputs or considerations, including social and economic concerns, and requires a goal or vision statement supported by well-defined and measurable objectives. It also requires the practitioner to continually monitor and respond to unforseen events. Research cannot be effectively conducted under the above circumstances, as the scientific process requires that variables being evaluated remain constant. Texas range scientists concluded that planned grazing should be considered a method of thinking that requires implementation of a high level of ranch management rather than as a grazing

system. In short, ranchers or land managers who attempt short-duration, high intensity grazing without meeting the planning criteria are likely to fail.

Range scientists who have carefully reviewed cases where grazing systems have been successful concluded that the key to success was implementation of all aspects of range management including range improvements, control of undesirable plants, improved distribution, and all other factors that reflect a raise in the intensity of management. Such broad-based management represents a strategy being employed, not a set of regulatory directions.

How to develop a grazing strategy

The key aspect that separates a grazing strategy from a system is the flexibility to adapt actions to weather, cattle behavior, and management needs on an annual basis or in a crisis situation. Each plan is tailored to an individual operation and not lifted from a publication.

With time and experience, the manager will improve the skills necessary to plan, implement, and review his or her strategy.

Formulating a vision for the ranch

As the grazing strategy will be an integral part of the ranch operations, ranchers and land managers should not isolate it from a total ranch plan. Establishing a long-term goal or vision for the ranch is not always easy and may generate considerable discussion among family members. Hired labor must also participate when the situation warrants it. A plan will often fail when those who have to implement it are not included in the visioning stage. The vision statement must encompass the following details:

- The landscape of the ranch including grasslands, wooded areas, and wildlife habitat
- The type and amount of production, including income from livestock, hunting, and other enterprises
- Preservation of family relationships, including ways to maintain both production and happiness

Regardless of the investment of time, the vision is important as it becomes the sounding board against which all operation decisions will be tested. When formulating a goal, action items such as a grazing strategy, fencing, or cattle breeds should not be included. These are tools that affect how the goal will be reached. Put the tentative goal in writing and then in a safe place. With exposure to the realities of the operation, the goal will change and become more specific.

Develop supporting objectives

Brainstorm and list concerns on the ranch. Then develop an objective to address each situation. Do not use the term, "problem," as it often reflects personal bias. At

The first step in planning a grazing strategy is to inventory the resource.

this time, ranchers may zero in on the grazing strategy. This is not necessarily the case, however, as other ranch activities may play a role in grazing concerns.

An example of a grazing concern is as follows:

Concern: A lack of distribution in the river pasture resulting in ungrazed forage and plant decadence.

Objective: Create more uniform use and improve plant quality in non-use areas.

Action: At this point, ranchers should be ready to discuss how the objective will be addressed. Possible tools may include fencing, treatments, water development, riders, etc. Ranchers should test their selection(s) against the overall goal. For example, does building a fence violate the part of the goal that says "the landscape should not be cluttered with man-made objects." In this case, fencing fails the test and other alternatives are explored.

In some situations, a decision may rate as borderline. If the decision is made to proceed anyway, a red flag should be raised that warns the rancher to watch developments closely and be prepared to revise the plan. This would apply to changes in stocking rates, deferred use due to a rotation, and length of grazing exposure. In these cases, the rancher should proceed with both caution and common sense. Remember that tradition includes experience and that there may be a good reason for what was done in the past. Keep in mind, however, that following a precedent can be an easy substitute for thinking.

Water developments are an important component of a rotation grazing scheme.

Planning the grazing strategy

The first step is to inventory the forage resource for pasture productivity, potential stocking rate, and associated limitations. Ranchers should tap into their own experience, but also seek assistance from the Cooperative Extension Service (CES) or Natural Resource Conservation Service (NRCS) staff. Then, considering a realistic grazing season and the identified concerns, design the strategy. Start with the first year's procedure, but develop a tentative scheme for the next few years, including deferment or rest where it may benefit the range. However, caution must be exercised in assigning changes in plant composition or range health to grazing management. Long-term monitoring has shown that easily detectable changes are most likely due to both amount and timing of precipitation. A helpful management tool is a fenced area where cattle are excluded. This allows comparison to the effects that grazing management may be imposing.

The rancher should make the final decision on grazing matters annually, taking care to avoid an inflexible schedule. The rancher should always assume that the initial plan is wrong in some respect.

Some important considerations in developing the strategy

- As additional fencing is added and cattle numbers remain constant, stocking density (SD) will increase in divided pastures (SD = number of cattle per unit area at any time). Forage utilization must be carefully monitored. The selectivity of preferred areas may decrease as the cattle are forced to use other parts of the pasture, but heavy utilization of preferred plants is possible, especially if regrowth occurs. As the number of pastures increase with division fences, the risk for management errors increases.

- Season-long rest or seasonal deferment will affect both range health and cattle performance. Range health may improve, but performance seldom does, as forage quality will be reduced. In the rested pastures, plant phosphorous content necessary for animal reproductive efficiency and growth will drop far below requirements. Also consider the increased stocking rate in the grazed pastures when one or more pastures is removed from a rotation. If the operation is understocked anyway, this may be of little concern, and the increased stocking rates may be beneficial. If the ranch is currently stocked at the recommended rate or above, however, ranchers should exercise caution. A longer grazing season coupled with adequate pastures will lend some security to this scenario, but there is still concern for fire hazard and cattle performance.

- Early season use increases the likelihood of regrowth for a second round of grazing later in the season. When certain warm season grasses are exposed to grazing more than once during the growing season, they are susceptible to loss of vigor and a decrease in the percent of the total plant composition normally represented in a particular range site type. Rest needed between grazings may be 60 days or more. A similar change in time of use may be necessary in successive years.

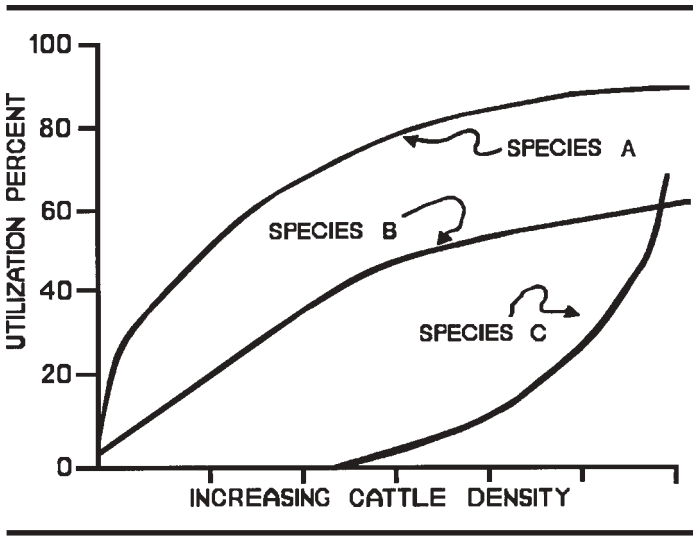

Figure 3. As cattle density increases, cattle will shift to less preferred species.

- If blowouts or eroded areas are a concern, ranchers should determine the cause. These occurrences have something to do with grazing. It is unlikely that reducing stocking rates or changing the season of use will have any healing effect. The same reasoning applies to the improvement of most riparian (stream side) areas and other wetlands. Damage in these types of areas is primarily a matter of the length of time these areas are exposed to grazing and trampling, regardless of cattle numbers.

- Severe utilization coupled with drought can be detrimental to range health, especially where warm season grasses are concerned. On range sites

Water developments and fencing are vital in a rotation grazing scheme, but an informed, qualified rider is still the most important aspect of success.

with primarily cool season plants, the plants will go into dormancy early during a drought. If not bitten to the ground during their growth period, though, they may still have a chance to set carbohydrate reserves. To do this, the plant must have some green leaf material remaining.

A year or two of rest following a drought may or may not restore plant health. At any rate, the drought will likely affect the whole ranch. Under these circumstances, managers may wonder which pastures will be selected for rest. In some circumstances, a complete de-stocking (removal of cattle) from the ranch may be necessary. This may be the only solution, but eliminates years of effort in building a superior cow herd. The longer a rancher waits to de-stock, the sooner the forage will be depleted. Then what? Ranchers should plan ahead by estimating the amount of forage available and remove stock accordingly at that time. The quality of forage can be extended and supplementation delayed by moving cattle through dormant pastures rapidly. This process allows the best quality to be taken first when nutritional requirements are higher than they will be in successive rotations. The process is like what happens naturally on corn stalks or sorghum.

In summary, it is important to consider the following basics of developing a grazing strategy:

1. Design a vision for the operation
2. List concerns
3. Inventory resources
4. Formulate objectives
5. Take action by implementing a grazing strategy
6. Assume the plan has flaws and monitor results carefully
7. Revise the plan as needed

"I contend that the level of management is the key to success or failure of any particular grazing scheme and that the grazing controls (system) imposed may have little additional effect."

W.A. Laycock, professor and former head,
Department of Renewable Resources, University of Wyoming

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