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# G80-504 Proper Livestock Grazing Distribution on Rangeland (Revised February 1996)

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# Proper Livestock Grazing Distribution on Rangeland

**Good grazing distribution can increase harvest efficiency and grazing capacity. This NebGuide discusses common grazing problems and offers solutions.**

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The 23 million acres of rangeland in Nebraska are mostly grassland and are primarily devoted to forage production for Nebraska's multibillion dollar beef cattle industry. Nebraska's rangelands are inherently productive, and potential returns from efficient management practices are high for livestock producers.

Proper grazing distribution is a factor which can increase livestock production from Nebraska's rangeland. Grazing distribution refers to dispersion of grazing animals over a management unit. It is just one element of good grazing management which should also include proper stocking rate, season of use, kind and proportion of livestock, and grazing system. The economic success of range livestock production is dependent on proper use of all forage resources. Areas within pastures that are consistently not grazed or only lightly grazed may significantly impact the economic efficiency of a range livestock enterprise.

## Grazing Distribution Factors

Factors that affect grazing distribution on Nebraska's range include: (1) grazing habits of kind and class of livestock, particularly as related to length and steepness of slope, (2) placement of water developments, (3) salt and mineral placement, (4) palatability of forage, (5) vegetation type, (6) kind and combination of range sites and range condition classes, (7) location of shade, (8) fencing patterns, (9) pasture size, (10) grazing system, (11) stocking density, and (12) prevailing winds.

Cattle will move into the wind when grazing, possibly to enhance their ability to smell; whereas they will

move with the wind during storms. Consequently, if summer breezes are from the southeast and winter storms from the northwest, pastures will often be grazed more heavily in the southern part. Although wind cannot be manipulated, Nebraska ranchers commonly use windbreaks to provide livestock protection from prevailing winds. The remaining factors affecting distribution of livestock grazing can be manipulated to effectively improve grazing distribution on rangeland.

## Ideal Grazing Distribution

Ideal grazing distribution of livestock occurs when proper utilization extends uniformly over the entire pasture. Cattle are creatures of habit and when left alone their grazing habits are often contrary to the concept of uniform grazing distribution. Consequently, grazing animals must be forced or enticed to seldom-grazed areas. Improved grazing distribution results in higher harvest efficiency because livestock consume a greater proportion of the available forage. With improved distribution, defoliation effects also should be spread across a greater proportion of available forage plants.

## Convenience Areas

Livestock, particularly cattle, are predictable in their grazing behavior. One of their most conspicuous habits is to graze convenient areas. These are generally areas close to water or those that are easily accessible, such as level terrain within an area of rough topography. Given the freedom of choice and/or the lack of sufficient enticement, cattle will abuse these convenience areas. This substantially lowers the overall range condition and potential livestock gain although other areas "less convenient" within the same pasture may have palatable vegetation. Stocking rates are generally calculated assuming uniform grazing distribution within a pasture. When this does not occur, convenience areas become overstocked and less convenient areas become understocked. Areas of high and low range condition develop within the same pasture even though the pasture is grazed at a "proper" stocking rate.

Uneven utilization often characterizes pastures in which all livestock requirements or potential enticements are at one location. For example, it is popular to place salt blocks, rubs or oilers, and supplemental feed troughs near the water supply. The practice is convenient for the manager, but intensifies problems associated with convenience grazing by livestock and results in poor grazing distribution.

## Results of Poor Grazing Distribution

Results of poor grazing distribution include:

1. low harvest efficiency because a portion of the pasture is underutilized;
2. lowered range condition in localized heavily used areas;
3. development of erosion problems in heavily used areas; and
4. lower animal production (per acre) because of reduced harvest efficiency.

The predictability of livestock grazing patterns should not be ignored, nor poor grazing distribution accepted, when knowledgeable management decisions can improve range livestock productivity.

## Methods for Improved Livestock Distribution

Techniques to improve livestock distribution can be classified into the following four general categories (*Table I*).

| Table I. Summary of techniques available for improving livestock grazing distribution. | | |
|---|---|---|
| **Approach** | | **Action or Consideration** |
| 1. | Enticing animals to specific locations | a. Water development placement<br>b. Salt and mineral placement<br>c. Supplemental feeding location<br>d. Rub and oiler placement |
| 2. | Force distribution of grazing animals | a. Fence along range sites<br>b. Pasture size<br>c. Pasture shape |
| 3. | Grazing management strategies | a. Rotational grazing<br>b. Stocking density<br>c. Flash grazing<br>d. Season of grazing |
| 4. | Livestock considerations | a. Class of livestock<br>b. Vegetation and terrain characteristics |

1. **Enticing the grazing animal to forage.** This category generally includes manipulation of livestock requirements as well as providing areas of highly palatable forage to entice animals to lightly grazed areas.

   **Water**

   Placement of water developments is probably the most important single factor affecting grazing distribution. Water requirements of grazing animals must be considered when planning water developments. Water needs vary with species and class of animal, nature of the forage, and weather conditions. On hot summer days, water availability should be as much as 18 to 20 gallons for a cow-calf pair and 1.5 gallons for a ewe-lamb pair. Under cooler conditions, water consumption for mature cattle and sheep will be 8-10 gallons and less than 1 gallon, respectively. Even partial water deprivation will reduce forage intake and consequently animal performance. Milk production and gains of young animals may be affected most severely.

   Forage utilization decreases rapidly as the distance to water increases, even in level pastures. Animals will overuse sites near water locations rather than walk greater distances to abundant forage. Consequently, improved harvest efficiency and/or animal performance justify the expense of water development on poorly watered ranges.

   Proper placement of water developments can be determined by observing livestock grazing behavior. For example, if cattle make proper use of forage plants up to one-half mile from water, then water developments a mile apart, or about one per section, would give adequate grazing distribution. For most situations in Nebraska, the recommended spacing varies from one water development per section to one per quarter section. Topography will affect the spacing with travel distance varying from 3/4 to 1 mile on level terrain to 1/4 to 1/2 mile on steep terrain. In those situations in which forage production is high (primarily eastern Nebraska) cattle have a tendency to remain closer to water, and forage utilization declines substantially at 800 to 1,000 feet from water. Closer water developments may be justified for highly productive pastureland in eastern Nebraska.

   Even with proper water placement, some local abuse of forage will occur around watering locations. Damage can be held to a minimum by proper management practices. Natural water supplies such as lakes, ponds, streams, and springs, and man-made developments such as wells, reservoirs, dugouts, and

rural water supplies can be used to provide livestock water. Quality of the water must not be overlooked. Measures taken to prevent excessive fouling of water sources along with periodic cleaning of tanks should result in increased acceptability and use of water sources.

Periodically changing the accessibility of water locations can be used as a tool to improve distribution in a large pasture. Using wells in conjunction with temporary watering locations (e.g., rain-fed dugouts) can help distribute livestock. Economical plastic pipe has provided new alternatives to water development. Rural water systems are becoming more popular and can be used to manipulate grazing distribution by providing water at several locations. A well or windmill can be used in conjunction with a storage reservoir and buried lines serving several tanks equipped with float valves. This system is particularly economical when the flow of water is controlled by gravity.

**Salt and Mineral**

Historically, it has been thought that cattle require water after salt consumption; however, this has proven to be false. Consequently, salt can be placed away from water and used to distribute grazing more uniformly. Livestock should be shown where the salt is located the first time. Salting locations should be more than 1/4 mile from the water to be a useful tool for livestock distribution and several scattered locations can be used in one pasture. Salt should be moved when forage plants in the immediate area have been properly utilized. Salt placement is potentially the most economical grazing distribution practice in Nebraska..

**Supplemental feeding**

Supplemental feeding may be used to entice animals to lightly grazed areas. It can be used effectively as a grazing distribution tool when protein is fed to cows during the winter or when supplements are fed during the summer under drought conditions. Normally it is necessary to show grazing animals the feed location the first time.

**Rubs and oilers**

Rubs and oilers may be used to attract livestock to lightly grazed areas. If efficient use of rubs and oilers does not occur, forced use at access points to water facilities may be necessary. The primary use of these tools is insect control, and their effectiveness should not be compromised. Adequate fly control has shown positive benefits to good grazing distribution. If flies become a problem, livestock tend to herd together to "fight flies" rather than graze. See NebGuides *G93-1180, Horn Fly Control on Cattle*, and *G94-1204, Face Fly Control Guide* for more information on fly control methods.

**Other methods**

In range regions outside of Nebraska, other methods are frequently used to attract grazing animals to specific areas.

In favorable situations, mowing and burning are used to entice animals into underutilized areas. Spot burning or mowing remove mature plant materials and provide lush regrowth which may attract grazing animals. Even though mowing and prescribed burning (i.e., systematically planned burning when weather and vegetation permit maximum benefits) can be useful management techniques, they are not applicable in many range situations because of biological and economic reasons.

Shade also can attract grazing animals because they consistently seek shade on hot summer days and will travel considerable distance to reach shade. Mobile, artificial facilities which provided shade on Oklahoma range were found to be nearly as effective as water location and supplemental feeding as a tool to improve cattle distribution on hot summer days. Providing shade, however, can lead to livestock

distribution problems as localized heavy grazing and trampling commonly develop around points of scattered shade, especially if the shade is fixed as is the case with trees.

2. **Pasture characteristics forcing improved livestock distribution.** Physical layout of a pasture, particularly as it relates to fencing, affects distribution of grazing livestock.

   **Fencing along range sites or other boundaries**

   Pastures are commonly unevenly used because of their variability in topography, plant communities, distribution of shelter or shade, and time of plant growth. In a heterogeneous pasture, livestock are poorly distributed as they tend to overutilize favored topographical sites and plant communities and underutilize less attractive areas. Much of this spatial variability in use can be minimized by basing fence placement on such land attributes as range site. Maximizing the homogeneity of a pasture improves livestock distribution and harvest efficiency and facilitates management of the forage resource. Management strategies (e.g., timing and length of grazing periods) are much more effective in a pasture dominated by a single range site than on a pasture composed of several sites. Fence development within a rotational grazing system should be planned with this in mind.

   **Pasture size**

   Pasture size cannot be separated from the effect of distance to water on livestock distribution. The area of a pasture should not result in distances from water that are greater than what livestock will readily use. Generally, livestock distribution can be significantly improved by simply reducing pasture size.

   **Pasture shape**

   Livestock distribution is generally better in pastures with low length to width ratios where distance to water is minimized. Long, narrow pastures with water at one end should be avoided because they are typically grazed much more heavily near the water source compared to the "back" part of the pasture. As length of the pasture and distance from water increases the differential in use between the front and back of the pasture becomes greater. Shape is much less critical for smaller pastures where livestock are never more than 1/4 mile or so from water.

3. **Grazing management strategies that influence livestock distribution.**

   **Rotational grazing**

   Rotational grazing involves moving livestock through two or more pastures with each pasture grazed one or more times during the growing season. Livestock distribution does not improve simply by implementing rotational grazing; however, rotational grazing can be used to affect grazing distribution because it potentially impacts distance to water, pasture size, pasture shape, pasture uniformity, and stocking density. Imposing rotational grazing on an existing set of pastures that had been continuously grazed does not affect the first four factors. Implementing rotational grazing can be designed to affect these factors only when an existing pasture(s) is subdivided to create a new set of pastures. Stocking density (i.e., number of animals per unit area at any point in time) is increased when rotational grazing replaces continuous grazing.

   **Stocking density**

   Rotational grazing naturally increases stocking density as livestock are no longer spread over one large pasture or several smaller pastures but consolidated, at any point in time, in some subunit of the entire grazing area. Increasing stocking density frequently improves grazing distribution and harvest efficiency because of competition for limited forage. As stocking density increases, forage allowance

(i.e., weight of forage per unit of animal demand at any point in time) decreases; therefore, the amount of forage available to each animal at a particular moment in time declines as the number of animals increases. With heavy grazing pressure and rapid removal of forage, a greater portion of the pasture forage is consumed by livestock and less is lost to such things as trampling, spoilage by animal wastes, and plant maturation and leaf death. At lower forage allowances, livestock performance (e.g., daily gain) should be monitored closely. Animal performance typically declines as forage allowance decreases.

**Flash grazing**

Use of high stocking densities is not associated with only rotational grazing. Flash or mob grazing is a short-term, one-time grazing event at a high stocking density that forces improved distribution of grazing animals within a pasture which has been negatively impacted by poor grazing distribution. Convenience areas will be heavily used but underutilized areas should also be grazed because of high stocking density. Removing unused mature herbage in underutilized areas should entice livestock into the area once lush regrowth appears. Overstocking can be a concern but vegetation recovery should be complete because flash grazing is a single, controlled event.

When applying flash grazing, animals with relatively low nutrient requirements (e.g., dry, mature cows) should be used because nutrient intake is normally limited by low forage allowance.

**Season of grazing**

There are a number of environmental factors, plant characteristics, and animal requirements that change through the year and affect livestock grazing distribution.

Decisions concerning grazing schedules should take into account seasonal changes in plant acceptability and livestock grazing behavior. Many plants that are unpalatable at maturity are acceptable to grazing livestock in immature stages. Pastures dominated by plants with seasonal shifts in palatability should be grazed when utilization and distribution are optimum. Grazing distribution of cows will generally improve during the late fall and winter because of decreased water needs and lower nutrient requirements after weaning. Utilization across a pasture also will be affected by environmental factors such as frost. Frost tends to reduce the coarseness of some forage plants and improve their utilization.

4. **Improving distribution by matching class of livestock with pasture characteristics.**

**Class of livestock**

Grazing distribution varies with class of livestock. The United States Forest Service reports the following:

1. yearling cattle utilize pastures more uniformly over variable terrain than cows with calves or mixed classes;
2. yearling heifers will utilize steep rocky terrain more evenly than yearling steers;
3. cows and calves utilize forages nearest the water much more heavily than do yearlings;
4. old cows with calves tend to utilize sheltered areas most, entering open terrain only when forced to seek forage; and
5. young cows with calves tend to use open grassland, entering inaccessible terrain only when faced with lack of forage.

**Vegetation and terrain characteristics**

Determining the optimum mix of livestock classes for a pasture of mixed vegetation and topography is difficult. It is not difficult, however, to match a set of pasture characteristics with the most suitable class of livestock. For example, placing yearling cattle in a pasture with variable terrain and young cows with calves in more open, level pastures can be easily accomplished.

## Conclusion

Using grazing distribution tools may fail to attain good animal distribution if the class and/or proportion of grazing animals is not optimum for the combination of range sites in the pasture. Generally, practices which are less expensive to apply should be used to the limit of their effectiveness before more expensive practices are undertaken. Thus, placement of salt and supplemental feed should be employed first to improve grazing distribution. Assuming water facilities are adequate for increased animal numbers, a suitable grazing system should be an early consideration. If proper grazing distribution is not achieved, more expensive methods such as fencing or water development may be required.

Improved grazing distribution can increase harvest efficiency and grazing capacity by 10 percent or more if initial stocking rates were proper. A cost-benefit analysis comparing added input costs and increased animal production associated with a grazing distribution practice must be conducted before implementing the improvement. The amount of money that can be expended for range improvements to achieve better livestock distribution will depend upon the potential increased livestock production resulting from the more efficient utilization of the forage resource. Finally, proper livestock distribution may also result in improved range condition, particularly on previously overutilized areas, and contribute to increased productivity and overall sustainability of the range resource.

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