Forage News
Mississippi State University Extension Service

Developing A Grazing System

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Approximately 80% of the pastures in Mississippi (MS) suffer from poor and uneven fertility coupled with serious weed management. Close to 90% of the pastures are under continuous grazing, with more than 50% of the forage production being underutilized. To improve the grazing systems in MS, it is necessary to balance the livestock demand with forage availability to promote rapid pasture re-growth (recovery) and increase the opportunity for long-term pasture persistence.

What are the main types of grazing systems?

There are two main types of grazing systems that could be utilized: continuous and rotational grazing. Each grazing system has advantages and disadvantages. The approach, style, and success of a grazing system depends on many factors such as land configuration, type of livestock, capital resources, and the producer's goals, attitude, and ability to adapt the daily challenges of the system chosen.

Continuous grazing is usually defined as putting a set of animals out on a pasture and leaving them in the same pasture year-round. Continuous grazing usually leads to the overgrazing of specific areas due livestock selectivity and causing issues with fertility and weed control. Under continuous grazing, the number of animals that could graze a specific area should be determined by the available forage yield during the lowest pasture production; usually from July to October depending on the area of the state. Some of the drawbacks that could seeing with this grazing system include low animal gain per acre, waste of forage biomass and quality, and selective grazing cause the pasture to become less productive with time and the loss of desirable species.

Rotational grazing involves fencing a pasture into several small area or paddocks. Subdividing the pastures is a good way to balance livestock needs with forage supply. Under this type of grazing system, the livestock graze the paddocks in a sequence and they are moved to a new paddock once the forage is ready for grazing. This type of system allows plants maintaining a more vegetative stage and better forage quality. When using rotational grazing, allow the grass to reach 10 to 12 inches in height before grazing and remove the livestock when the pasture is grazed down to 3 to 4 inches (**Table 1**). Using relative high stocking rates in each paddock will force animals to be less selective and graze the paddock more uniformly. By divining the pasture into small paddocks, grass could be harvested for hay early in the season while forage production is abundant. Hay could be used as emergency forage in case of drought during the summer or for winter feeding. Do not cut hay late in the season since it will cause a delay in the pasture rotation and can put an extra pressure on the areas being grazed. Rotational grazing does not necessarily increase animal daily gains, but does allow a higher stocking rates to be carried, which increases animal gain per acre.

Table 1. Suggested residue height, rest period, and possible maximum forage utilization of selected forages.

Species	Residue Height (inches)	Rest Period (days)	Maximum Utilization (%)
Alfalfa	**3 – 6**	**15 – 30**	**50**
Annual Ryegrass	**3 – 4**	**7 – 15**	**75**
Arrowleaf Clover	**3 – 4**	**10 - 20**	**50**
Bahiagrass	**4 – 6**	**10 - 20**	**60**
Bermudagrass	**3 – 4**	**7 - 15**	**75**
Oat	**4 – 6**	**7 – 15**	**75**
Red Clover	**4 – 6**	**10 – 20**	**50**
Rye	**4 – 6**	**7 – 15**	**75**
Tall Fescue	**3 – 4**	**15 - 30**	**75**
Wheat	**4 – 6**	**7 – 15**	**75**
White Clover	**4 – 6**	**7 – 15**	**75**

There are different types of rotational grazing systems that could be incorporated into a livestock operation. They include strip grazing, forward grazing, mixed grazing, and mob grazing [Intensive Rotational Grazing (IRG) or Management Intensive Grazing (MIG)].

A. ***Strip Grazing –*** The animals will receive enough pasture supply to sustain grazing from several hours to a couple of days depending on the forage species by utilizing movable electric fences. It is important that when using strip grazing animals start grazing close to the water source to avoid trampling of the forage when returning to the water source. This grazing method is labor intensive because electrical fences have to be moved frequently, but it results in the utilization of high quality feed with the least waste and damage to a pasture.

B. ***Forward Grazing*** – The pasture is grazed by two groups of animals within the same species. Usually young animals or animals with higher nutritional needs are allowed to graze the top of the plants first with the most nutritional leaves. The second group of animals then will graze the forage left by the first group. This is a situation where calves might be grazing before cows. This method could give an advantage to higher weaning weights when forage production might be limited or where competition for forage might exist. Forward grazing is usually accomplished by using creep gates or by setting fences high enough for the young animal to pass underneath.

C. ***Mixed Grazing –*** Common method practiced by producers that might have different types of livestock (e.g. horses, cattle, sheep, or goat) in the grazing at the same time in the same pasture. This type of management offers the opportunity to graze plants more evenly since one type of livestock might graze plants not grazed by the other group. Usually sheep and cattle are an ideal combination for this type of grazing system. It is not recommended to graze sheep and horses together since they are considered non-selective animals and could affect forage production and persistence of favorable species.

D. ***Mob Grazing –*** A rotational grazing system gaining a lot of interest and it requires the pasture being divided into numerous paddocks, enabling hourly to daily animal rotation among paddocks. This type of system is also known as MIG. High stocking rates can be grazed in the paddocks until the forage is grazed down evenly and closely. Stocking density could range from 100 to 400 heads/acre depending on the management of the operation. This management system emphasizes more management of forage consumption, quality, and re-growth. Paddocks are grazed on the basis of growth and quality, but not always in the same order.

Setting up a Rotational Grazing System

One of the first questions asked when developing a rotation grazing system is how many paddocks are needed? A common rotational grazing system usually has 2 to 4 paddocks in which animals graze the paddock for about 7 days or longer and then are moved to the next paddock. In a more practical manner, the actual number of paddocks will depend on the rest period that the paddock will receive. In most cases, a rest period of 10 to 30 days during each cycle is recommended depending on the forage species being utilized. More paddocks means increasing the length on the rest period and decreasing the length of time an area is grazed (**Figure 1**). Other things that need to be considered when developing a rotational grazing system include: (1) conditions of the pastures, (2) the amount of forage available (See Extension Publication **P-2458**), (3) estimated seasonal growth rates of existing forage species, (4) the number and nutritional needs of the livestock, (5) fencing requirements, and (6) water sources and placement.

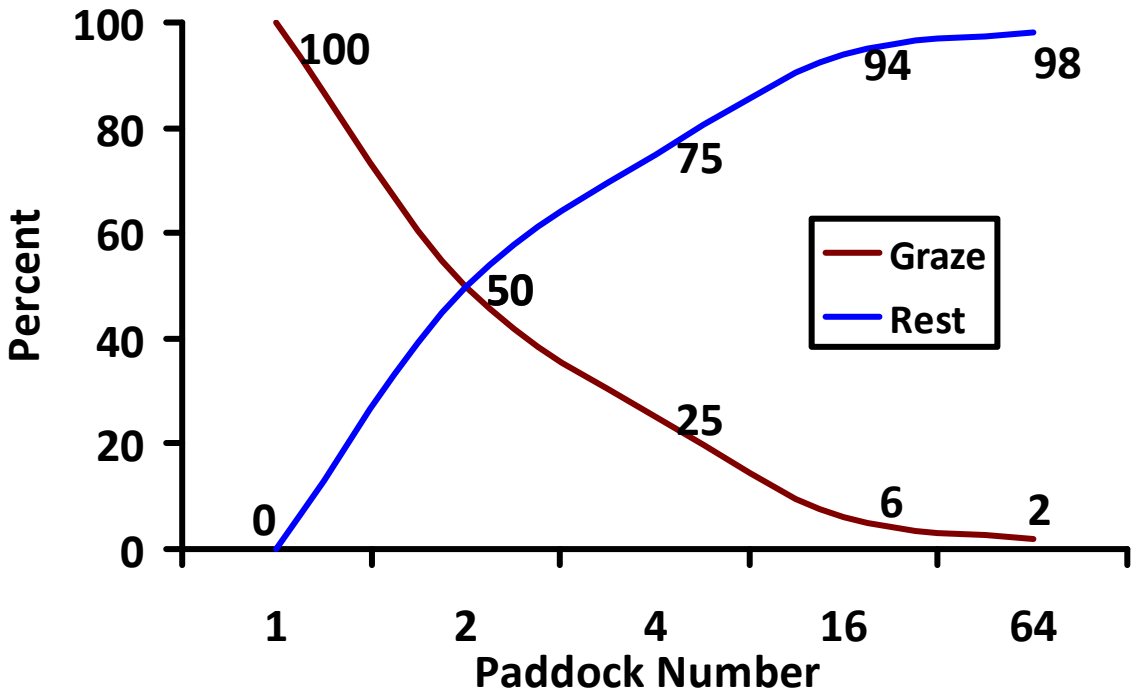

Figure 1. Relationship between paddock number and rest period for a 100-acre field dived into 2 paddocks (50 acres/paddock), 4 paddocks (25 acres/paddock), 16 paddocks (6.25 acres/paddock) and 64 paddocks (1.57 acres/paddock).

Steps to Developing an effective Rotational Grazing:

For this example, it is assumed that 100 heads of stocker calves weighing 500 lbs each and having a daily dry matter intake (DMI) of 3% their body weight will be used in the rotation system. Average forage dry matter (DM) production in the farm is 2000 lb/ac and animals will efficiently graze (GE) 60% of the pasture. The producer will graze the pasture for 4 days with a rest period of 28 days (grazing days can be calculated using equation in step 1 if forage production is known).

1. **Determining the amount of grazing days.**

$$\text{Days} = \frac{\text{Total Forage (lb/ac) x Acres x Grazing Efficiency (\%)}}{\text{Animal Weight (lbs) x Intake Rate (\% Body weight) x Number of Animals}}$$

Forage Utilization or Grazing Efficiency:

- Continuous grazing: ~30 to 35%.
- Rotational grazing: ~50 and 75%.

2. **Calculating the number of paddocks.**

$$\textbf{Number of paddocks} = \frac{\textbf{days of rest}}{\textbf{days of grazing}} + \textbf{1}$$

Example:

$$\text{Number of paddocks} = \frac{28 \text{ days rest}}{4 \text{ days grazing}} + 1 = \textbf{8 paddocks}$$

3. **Calculating acres required per paddock.**

$$\textbf{Acres required per paddock} = \frac{\textbf{weight (lbs) x DMI x animal Number x days per paddock}}{\textbf{DM (lb)/acre x \% utilization}}$$

Example:

$$\text{Acres required per paddock} = = \frac{500 \text{ lb x 3\% x 100 head x 4 days}}{2{,}000 \text{ lb/acre x 60\%}} = \textbf{5 acres}$$

4. **Calculating total acres requires per grazing cycle.**

Total acres required per grazing cycle = number of paddocks x acre required/paddock

Example:

Total acres required per grazing cycle = 8 paddocks x 5 acres/paddock = **40 acres**

5. Calculating stocking rates.

$$\text{Stocking rate} = \frac{\text{number of animals to be grazed}}{\text{total acres grazed}}$$

Example:

$$\text{Stocking rate} = \frac{100 \text{ heads}}{40 \text{ acres}} = \textbf{2.5 head per acre}$$

6. Calculating stocking density

$$\text{Stocking density} = \frac{\text{number of animals grazing on a paddock}}{\text{paddock size (acres)}}$$

Example:

$$\text{Stocking density} = \frac{100 \text{ heads}}{5 \text{ acres}} = \textbf{20 heads/acres}$$

Summary

Rotational grazing offers several benefits such as allowing forage plants to renew energy reserves, rebuild vigor, deepen their root system, and give long-term maximum production. It could only take about 15 to 20 minutes per day to move cattle if fence is properly placed in a rotational system, while feeding hay or silage could take 20 minutes to 1 hr and it could take approximately 7 hours per acres to make hay. Rotational grazing allows your pastures to stay green, improving pasture and livestock health. As a bonus, there should be a decrease in feed cost and the amount of hay being fed.