

MANAGING AND MONITORING ROTATIONAL GRAZING SYSTEM

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What is it called when you move cattle from one pasture to another, throughout the growing season? That would depend on who you ask. I've heard it called: rotational grazing, intensive grazing, and rational grazing. The first lesson for today: it doesn't much matter what you call it. All of these management systems are based on the same two or three principles, mostly related to managing the way plants grow using grazing animals. Today, we will look at these principles (from the plant's perspective) and discuss the importance of management and monitoring in successful grazing systems. Grazing systems don't need to be complicated, and they don't need to be expensive to implement. Rather, they need to be based on the requirements of the plants, and they need to be flexible.

Forage crops play a central role in Maine beef production systems. Poorly managed systems cost you money – for cattle to gain weight for market, you are forced to buy that gain with grain and protein. This is true for forages in short supply or forages short in quality. Well managed systems pay you for your management. Improved grazing management can accomplish many things, including; greater forage supply, increased forage quality, reduced supplemental feed, and longer grazing season. All of these save money, because pastures are your cheapest source of feed.

Thinking About How Plants Grow

Before looking at the specifics of grazing management, it helps to look at the way plants grow. When plants begin growth in the spring (producing the first small leaves), they are using sugars or energy that they stored the year before. As these leaves get larger, new energy is produced from photosynthesis. These two energy sources (stored sugars and photosynthesis) are the only energy sources that the plant has – our management is directed at making sure that one or the other is always available.

When they get big enough, some plants begin to work at refilling the reserves that they use for energy. Alfalfa is the best example of this type of plant – think about the sugars stored in the long tap root of this plant. At some point, enough energy is produced each day that some can be put in reserves. By the time the seedhead or flower appears, the reserves are usually full again. This whole cycle starts again when the plant is cut or grazed. If the plant is harvested when reserves are low, regrowth is both slower and weaker. If this is done over and over, the plant gets weaker and dies. (We'll come back to this topic, as it relates to grazing management)

Other plants aren't into saving like alfalfa. Orchardgrass is a good example. After initial spring growth, orchardgrass survives from day to day, producing its energy as it needs it. When it is harvested, it continues to rely on photosynthesis for the energy to start new growth. This means that some leaf material must remain after harvest –

orchardgrass cannot tolerate repeated, close grazing.

Using just these two plants makes an important point when thinking about managing pastures in the Northeast – all plants are not the same, so be prepared to manage them differently. As you will see below, the management of grazing systems is based on managing the energy levels and regrowth of the plants.

Grazing Without Management

It is possible to have a grazing system without management (unless you count the perimeter fence). Simply turn a few animals out into a pasture that is too large. In your mind, picture the result – animals have continuous access to any (and all) forage in the pasture. As the manager of this system, you have only three management options. One, allow animals to continue to graze. Two, let them graze, but give them hay (when forage is in short supply). Or three, remove the animals from the pasture (when forage is either gone or gone by).

If you think about using the animals to manage the plants, you again have little control over what is happening. There are three important things that you can't control.

1. Selection: Which plants are grazed or not grazed.
2. Severity: To what extent they are grazed (grazing height).
3. Intensity: How often they are grazed.

The fact that these are not controlled has some very noticeable consequences. First, desirable plants are grazed repeatedly. This usually continues until growth stops or the plant dies. Because Kentucky bluegrass can tolerate this repeated grazing, it usually dominates these pastures. Second, the

maturity of the standing forage becomes more and more uneven as the season progresses. Very immature forage (that might have been grazed the week before) can be seen next to fully mature plants with seedheads. Third, this leads to uneven quality of regrowth. The immature plants are grazed again and again, while the mature plants continue to be ignored. Fourth, utilization of the forage produced is very poor (it can be as low as 20-25%): Usually, you don't run out of forage, you just run out of forage that cattle will eat. The rest is either too mature or has been trampled or fouled with manure or urine. And fifth, there is poor distribution of animals in the pasture. Half of the pasture may be grazed to bare ground while the other half goes to seed.

In terms of management, the input is minimal. This coincides with the minimal opportunity for profit and an increased risk. The behavior of the animal, which is what you actually control in grazing systems, is not being controlled – the result is a very uneven situation.

Specifics of Grazing Management

When to Graze: For many plants, grazing can begin when the plant is only 6-8 inches tall. (The notable exception to this is timothy, which should be grazed very early or later, but not between.) Forage quality at this point is very high, and will likely exceed the requirements of the animal. Animals will be moved fairly quickly, because standing forage yield is relatively low. If plants are allowed to grow taller (8-12 inches) before grazing begins, there is more forage present and rotation will likely be slower.

How Long to Graze: From the plant's perspective, the critical factor is that the grazing period is short enough so animals do not graze regrowth during

the same grazing period. In May and June, when growth is very rapid, plant regrowth may begin in 3-4 days, so cattle are moved more often. (It may be necessary to move them faster just to keep up with forage growth anyway.) In July and August, when the weather is hot and dry, it may take a week or longer for regrowth to begin. Note that the rotation speed is faster in the spring and slower in the summer just based on this single plant factor. The faster rotation also yields other benefits, including more uniform grazing height (and thus more uniform regrowth), less trampling and fouling loss, and smaller changes in quality from one paddock to the next.

How Long to Rest: The rest period should be long enough for the plant to grow back to either the same height or the same stage of maturity that started the previous grazing period. In the spring, this can be very rapid (10-14 days). In the summer, it may take 30-35 days. This allows the plant to return to the same level of energy reserves for each grazing period.

If you read these sections carefully, you should note a very important principle about grazing systems. Grazing rotations are faster during rapid growth because they need to be. Grazing rotations are slower during slower growth because they need to be. This also explains why you need more land (more paddocks) during the summer – because the growth is slower, it will take more time to return to a given paddock.

Managing and Monitoring the Grazing System

Know What You Are Managing: Cattle and turkeys are managed differently, and you easily recognize the difference between the two animals. As mentioned several times before, plants are also managed differently. Be prepared to:

1. Know the difference between the most common forage plants.
2. Distinguish between desirable and undesirable plant species.
3. Recognize changes over time (like increased clover content or decreased orchardgrass growth).

All of these are done by observation – by walking around your paddocks on a regular basis. You can't manage a grazing system from the kitchen table! Extension fact sheets are available to help you identify different forage plants and how they are best managed.

Know Quality and Intake Requirements of Cattle: This management factor is not specific to cattle on pasture. You are always trying to match forage quality with the nutritional requirements of your cattle. On well-managed pasture, quality is rarely a problem. Estimates of dry matter intake can be helpful in establishing paddocks of the right size.

Know When to Begin Grazing: Remember that most plants must reach some critical stage of growth before being harvested (if they are going to survive multiple grazing cycles). The stage of growth is also closely tied to forage quality. Grazing too early can reduce plant health; livestock performance is hurt by grazing too late.

Estimate Length of Grazing Period Before hand: To estimate the length of the grazing period for paddocks of known size, you need to know livestock intake (mentioned above), and the amount of forage available. Here is an example:

Paddock size	=	2.5 acres
Forage Available	=	1200 lb/a
Twenty-four cows in herd, with intake of 25 lb. DM/day (total = 500 lb/day)		
Grazing period	=	$(2.5 \text{ acre} * 1200 \text{ lb/a}) / 500 \text{ lb per day} = 6 \text{ days}$

The alternative is to set the grazing period to a certain number of days, then calculate how big the paddock needs to be. It seems easier to move cattle than to build the fence around them.

There are several ways to estimate the amount of forage available in a paddock, based on forage height and/or forage density. A Pasture Plate (made of Plexiglas) combines these ideas. It measures the height of the plate when it is sitting on top of the forage, and converts this to pounds per acre, usually around 400 pounds per inch of height.

Monitor Forage Utilization: Again, this is based on observation. How quickly are cattle consuming the available forage? Will this paddock last for 6 days, as you estimated beforehand, or do cattle need to be moved after 4 days? Are they eating in only part of the paddock (if so, it's probably too big)? Are they distributed throughout the paddock? What adjustments can be made, even on a daily basis?

Necessary Records for Grazing Systems: The usual animal performance data should be recorded (average daily gain, supplemental feed inputs, etc.). There are additional records that should be kept on the grazing system itself.

Grazing days: this is the number of animal units times the length of the grazing period. It should be recorded for each paddock in each grazing period. Over time, you can use this to estimate forage productivity, and to

identify paddocks that need more attention.

Forage In and Forage Out: Average forage height when grazing begins in each paddock, and average height when grazing ends in each paddock. As mentioned above, this can be measured directly by several methods.

Forage Maturity: The stage of growth of most common plants should be recorded, because it is the best indicator of quality.

Forage Utilization: Every time cattle leave a paddock, spend 5-10 minutes looking at the paddock. See if grazing is uniform over the whole area.

The Demand for Flexibility and Planning

A rotational grazing system is not set in place in May and followed without change until October. It requires constant observation, and must be flexible. You are not only concerned with the paddock cattle are now grazing, but also the paddock they move to three days from now and three weeks from now. Plan Ahead!

The change in forage production from early to mid-season will require planning. Earlier, we looked at changes in rotation speed as plant growth changes. The end result of these changes is fairly predictable: the entire grazing system is about twice as large in mid-summer as it was in the spring. If it remains the same size all year, either you are under grazing in the spring or over grazing (or feeding hay) in the summer. An easier method is to harvest a portion of the system in June, then use it for grazing when the rotation slows in July. Plan Ahead!!!