

## **Dairy Grazing Newsletter – April 2007**

Prepared by: Stacey Hamilton, University of Missouri Extension

As dairy grazing producers you have probably come across a few people that simply cannot understand how you are able to manage your pastures and determine how much of a paddock to allocate to your herd. They also wonder why your system appears greener and grows more during the summer when compared to their dry brown looking pastures. The answers to these questions are basic plant and animal physiology.

While watching your cows graze you have probably noticed the cows chase after the most vegetative and tender plants first and then graze the least desirable plants last. In fescue and perennial ryegrass the plant will normally only have 3 live leaves on each tiller; when the fourth leaf begins to develop the leaf that formed 2-4 weeks ago begins to die. Allowing the plant to continue to grow beyond this 3 leaf stage will reduce forage quality for the cow and have little impact on increased yield. Unpublished data from the University of Missouri shows over 2-5000 pound increase in yield when plants are harvested at the 2 inches versus 4-6 inches.

Cows that are on a continuous grazing system will continually graze back the new leaves that are forming every 6-10 days while leaving the forage they missed earlier to become more mature and less palatable. Over 85% of the carbohydrates are in the bottom two inches of the plant stubble. Continually removing these new leaves depletes the carbohydrate reserve of the stubble and roots weakening the plant and slowing regrowth. However in a well managed rotational grazing system the cows are removed from the paddock when the plant has been grazed down to approximately 2-2.5 inches. This leaves the carbohydrate stores in the plant stubble and roots to re-establish the new leaves. Cows are placed back on the paddock when the plant has grown 2-3 new leaves and has nearly replenished the carbohydrate stores in the plant.

Producers that manage forages in such a way will help ensure quality of forage fed to the cows as well increase yield throughout the grazing season.

Producers can more efficiently run their grazing operation if they follow the 3 M's of grazing; Measure, Monitor and Manage. Measuring pasture is critical in understanding the amount of forage the producer has at the present and helps establish a plan for grazing pressure for the next 7-10 days. Knowing the total amount of forage over the entire grazing platform is called "average cover". Average Cover is the equivalent in knowing the amount of hay in the barn or silage in the pit at a given time. However, average cover is constantly changing due to grazing pressure (stocking rate) and weather conditions. This is the reason measurements of every paddock on the entire farm must be taken weekly to give the producer an accurate estimate of the amount of feed available for the herd. Average cover is calculated by taking the dry matter/acre X the number acres in the paddock = Total dry matter in paddock. Sum all the total dry matters in each paddock

and divide by the total number of acres in the grazing system. An example of how to calculate average cover is below.

Paddock	DM/acre	acres	Total
1	1200	4	4800
2	2800	3	8400
3	1500	5	7500
4	2250	4	9000
5	2400	5	12000
6	1350	5	6750
7	1800	3	5400
8	2000	4	8000
9	2500	6	15000
10	1700	4	6800
TOTAL		43	83650

$$83650/43 = 1945 \text{ pounds per acre average cover}$$

In this example there is nearly 2000 pounds per acre for the entire farm. If the producer is grazing down to 2-2.5 inches then the post-grazing residual would be around 1500 pounds per acre. This tells the producer they have around 500 pounds per acre available to the cows or 21,500 pounds of DM forage for the entire farm (500#/acre X 43 acres).

Another critical number taken from measuring is the average growth rate of the forage of the farm. This predicts for the producer the amount of feed that will be grown in the next 7-10 days and allows them to determine fertilization practices, feed conservation (silage, hay or balage) and increase/decrease of supplemental feed. To determine if a farm is in surplus or deficit mode the producer must first calculate his average daily feed demand. This can be easily determined by the following:

Using the example above of a 43 acre farm with 50 cows.

Cow Dry matter consumption of 38 pounds/day.

Grain consumption of 10 pounds/day.

Forage consumption from pasture 28 pounds/day (38-10=28)

The average daily feed demand for this scenario would be nearly 33 pounds of forage per day. This is calculated by determining the stocking rate. 50 cows divided by available acres = 1.16 cows/acre. The stocking rate is multiplied by amount of forage needed per cow (1.16 cows/acre X 28 pounds/cow/day = 32.6 pounds). This suggest the farm would need to grow grass at 33 pounds per day per acre to maintain average forage cover.

Now if the producer is trying to determine if they can “pull” some of the paddocks out of system for silage or hay they would calculate feed demand in this manner.

Using the example above of a 43 acre farm with 50 cows.

Cow Dry matter consumption of 38 pounds/day.

Grain consumption of 10 pounds/day.

Forage consumption from pasture 28 pounds/day (38-10=28)

Plan on removing 5 acres for silage/hay

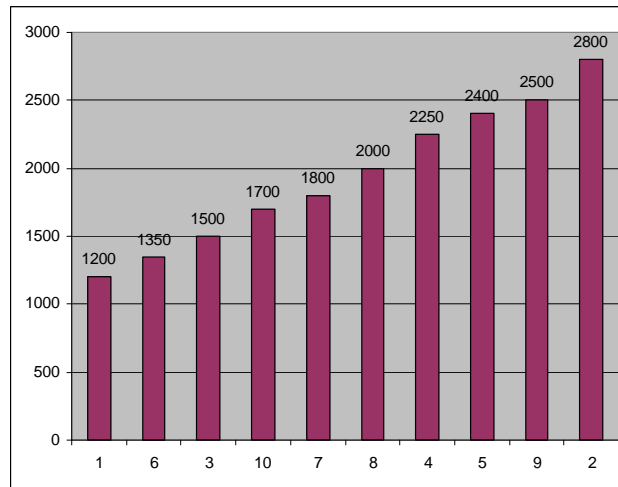
The Stocking rate would change to 1.32 cows/acre (50 cows divided by (43 acre farm – 5 acres for silage = 38 acres for cows).

The stocking rate is multiplied by amount of forage needed per cow (1.32 cows/acre X 28 pounds/cow/day = 37 pounds). This suggests the farm would need to grow grass at 37 pounds per day per acre to maintain average forage cover. This would also suggest it would be appropriate to remove at least 5 acres from the system as long as the growth exceeds this 37 pounds per day.

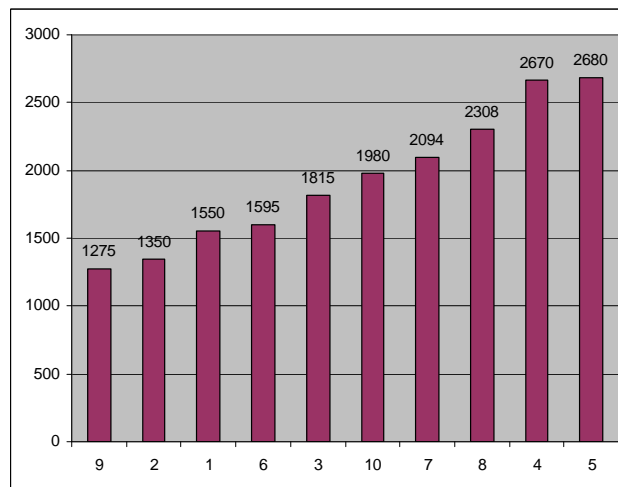
Pad	Date 4/1/2007			Date 4/8/2007			Difference
	DM/acre	acres	Total	DM/acre	acres	Total	
1	1200	4	4800	1550	4	6200	1400
2	2800	3	8400	1350	3	4050	
3	1500	5	7500	1815	5	9075	1575
4	2250	4	9000	2670	4	10680	1680
5	2400	5	12000	2680	5	13400	1400
6	1350	5	6750	1595	5	7975	1225
7	1800	3	5400	2094	3	6282	885
8	2000	4	8000	2308	4	9232	1232
9	2500	6	15000	1275	6	7650	
10	1700	4	6800	1980	4	7920	1120
						Total	10517

The farm grew 10517 new pounds of forage over the 7 days (April 1 to April 8). You will notice we did not include paddock 2 (3 acres) or paddock 9 (6 acres) as they were grazed just previous to the second measurement. This tells us to use only 34 acres in calculation of dry matter growth rate. Growth rate of the farm for this period would be 10517 # new forage divided by 34 acres = 309 pounds for the period divided by 7 days = 44 pounds of forage grown per day per acre.

Date April 1, 2007



Date April 8, 2007



Another way to calculate growth rate is from the grazing wedge that is generated weekly from the measurements of each paddock. Simply take the mid point of the last graph, in this case, paddock 10 and take 3-5 paddocks on each side of it. If a producer has many paddocks they may wish to take every other paddock on each side to get their 3-5 samples from each side. In this case, being a small farm, we will take 3 paddocks on each side. This approach eliminates the extremes on each end of the wedge such as recently grazed paddocks as well as paddocks ready to be grazed. In this example we take the mid point from April 8, paddock 10 and then the 3 paddocks to the left and right of it; paddocks 1, 6 and 3 from the left and paddocks 7, 8 and 4 from the right. If we add the dry matter from each of these paddocks ( $1550+1595+1815+1980+2094+2308+2670 = 14012$ ) we will get the dry matter per acre total for these 7 paddocks. We then go graph April 1 and locate each of these paddocks and add the dry matter per acre for this date ( $1200+1350+1500+1700+1800+2000+2250 = 11800$ ). We then subtract the April 1 dry matter from the April 8 dry matter ( $14012-11800 = 2212$ ) and divide by the number

of paddocks ( $2212/7 = 316$ ) and then divide by the number of days ( $316/7 = 45$ ). This gives us a daily growth rate of 45 pounds per day per acre. This number relates well to our first example of 44 pounds where only the most recently paddocks were not included in the calculation.

The important thing regardless of which method a producer uses to determine daily growth is that it is crucial to measure each and every paddock weekly. It does not have to be done with an expensive electronic platometer but can be simply walking the paddocks with a yard or grazing stick and taking measurements throughout each paddock as you go. It will take manual calculation of the average for the paddock as the producer records a minimum of 30 readings per paddock. It also does not require computers or software but can be plotted on graph paper giving the producer the same visual and information that would be presented off more expensive equipment. The data gives the producer important information such as post-grazing residual (was it higher or lower than 2.5 inches) and pre-grazing herbage which tells them which paddocks they should go to next.

The second “M” of grazing is monitoring. The measurement aspect may be a bit daunting to the beginning grazier with the time involved in the actual collecting of data and the calculations associated. However, as the producer learns how to use the data and sees financial benefit (potential reduced fertilization, reduced hay and grain feeding) the time spent will seem trivial. The monitoring is much easier and less time consuming. Fescue and perennial ryegrass will normally only have 3 live leaves while orchardgrass will have 4 and some bromes 5 live leaves. When the plant reaches its maximum number of live leaves and begins to develop a new leaf the original (leaf 1) will begin to die and forage quality begins to decline. As the producer is walking his fields to measure for dry matter they should grab a handful of grass in their tallest paddocks and count leaves. If the grabbed handful has the majority of the plants in the 2-3 leaf stages then the plant physiology is ready to be grazed. If the paddock contains plants with mostly 3 or more leaves then the paddock needs to be grazed or harvested mechanically immediately to maintain quality keep the paddock in the system. However if the plants have less than 2 leaves the paddock should not be grazed to prevent weakening of the stand by reducing the carbohydrates stores. The producer will soon visualize that a paddock ready to graze in the spring with 3 leaves may have a dry matter reading of 2800-3000 pounds per acre while in the hot summer months the same field may reach 3 leaves at 2400 pounds. One purpose of these exercises is not only for an immediate financial advantage but also tells the producer to graze the tallest paddocks first based on leaf growth stage.

The third “M” stands for management. This “M” has been intrinsically involved through this discussion. The first “M” Measurement and second “M” Monitor are allowing for the third “M” Management to take place. It tells a producer where he has been, where he is and predicts where they are going with their grazing system.