

USING A PASTURE STICK TO MEASURE PASTURE GROWTH

Rory Lewandowski, Extension Educator Wayne County

Pasture measurement allows a grazer to make an educated estimate of how much forage dry matter (DM) is available in a pasture paddock. Once forage DM is estimated, then the grazer can figure out how many animals can be grazed in that paddock for a given period of time.

To get the most benefit from pasture measurement, it must be done on a consistent basis. Think in terms of measuring pasture on a weekly basis. For the grazer serious about increasing pasture use and efficiency, weekly pasture measurement is not something that is added or squeezed in to an already busy schedule, but rather is a necessary management task. Pasture measurement done on a weekly basis will help the grazer to make decisions about how to best use pasture paddocks and over time will provide a trend of how much forage DM is being produced per week. Using this type of information can help a grazer plan the livestock rotation for periods of rapid growth as well as periods of slow growth. The trend can provide an early warning system in a drought year and help the grazer plan accordingly.

Taking a single pasture measurement in a paddock is not advisable because of the variability that typically exists in pasture growth and density across a paddock. Take 20 to 30 separate, random measurements across the paddock. The more that are taken, the more accurate your estimate of forage DM will be.

How will you decide which paddock to measure on a weekly basis? One strategy is to measure the same paddock each week. If that paddock is due to be grazed, then measure before animals are turned in and when animals are turned out. These additional measurements will give you information about how you are managing plant residual, an important part of how quickly a plant recovers from a grazing pass. Most pastures should be managed so there is 1200 to 1400 lbs. of DM after animals have grazed. The other advantage of this strategy is that you will get a good idea of pasture growth rate in terms of how much DM is being added per acre each week.

Another measurement strategy is to measure a paddock that is due to be grazed each week. This will help to give you an idea about your rotation speed. If you are consistently measuring 2400 to 3000 lbs. of forage DM per acre in paddocks about to be grazed, this indicates the rest period has been long enough. If forage DM is less than 2200 lbs. per acre then rotation speed should be slowed down to allow the pasture more time to recover and grow.

The most economical option is the pasture stick, which costs about \$5.00 to \$7.00 and is generally provided to participants of grazing schools. The current model of the pasture stick being used in Ohio has a scale to measure forage height, a scale to estimate forage density, a table of lbs. of DM/inch for various pasture forage types, information about length of grazing rotations and information about calculating the lbs. of DM available for grazing. The basic steps involved in using the grazing stick are:

- Measure pasture height in 20-30 random areas of the paddock. Record those heights.
- Add the measurements to get a total and then divide that total by the number of measurements. This will give you average pasture height.

- Estimate pasture density using the dot scale on the pasture stick. This will allow you to estimate the lbs. of DM per inch.
- Multiply the average height (inches) by the pasture density (lbs. of DM/inch). This will give you the total DM per acre in that paddock.
- Subtract the amount of residual DM you want to leave in the paddock. This is plant height after grazing times the lbs. of DM/inch. If you plan for a 3 to 4 inch residual, 1200-1400 lbs. is about right. Consider the result of total DM minus residual DM to be the forage available for grazing.
- Figure out the amount of utilizable forage. All of the forage available for grazing will not actually get grazed. There will be waste. The smaller the paddock size and the fewer days animals spend in that paddock the higher the grazing efficiency. If you are moving animals every 3-4 days use a 60% grazing efficiency to begin with. Multiply the available forage DM by the grazing efficiency expressed as a decimal. For example 1500 lbs. DM x 0.60 = 900 lbs. of utilizable forage DM/acre.
- Figure out the livestock need in lbs. of DM/day. Most livestock will consume between 2.5 to 3.0 % of their body weight in DM per day. You will need to know the average body weights of your livestock. Multiply the DM/day requirement for an individual animal by the total number of animals that will graze in that paddock.
- Figure out what the paddock can support. Divide the utilizable forage by the livestock requirement to get how many days of grazing the paddock will provide.

Using the Pasture Stick: Example 1: Sheep

30 head of sheep, average weight is 150 pounds.

There are five 3.5 acre paddocks. You took 30 random pasture stick measurements in the next paddock scheduled to be grazed and calculated an average of 8.5 inches and on average, 2 dots are visible on the stick. The pasture is a mix of orchardgrass, tall fescue and clover. Based on these measurements and the needs of your sheep, how many grazing days are available in this 3.5 acre paddock?

1. Calculate sheep forage need:

30 head of sheep that average 150 lbs, consuming 3.0% of body weight in DM/day. $150 \times .03 = 4.5$ lbs of DM/day. 4.5×30 head = 135 lbs. of DM/day needed for these 30 sheep.
2. Calculate the amount of forage available in the paddock
 - a. (Total inches – residual inches) x density = forage available to graze
 - i. $(8.5-3.5) \times 200$ lbs DM/inch = 1000 lbs of DM/acre
 - b. Utilization rate: % depending upon paddock number and management
 - i. $1000 \times .55 = 550$ lbs. of useable forage DM/acre

- c. Total useable forage in paddock: Useable forage/acre x paddock acres
 $550 \times 3.5 \text{ acres} = 1925 \text{ lbs. of forage DM}$
- 3. Calculate grazing days
 - a. Total useable paddock forage DM divided by total DM livestock need per day:
 $1925/135 = 14 \text{ days}$

Example 2: Cattle

30 beef cows, early lactation. Ave weight is 1350 lbs. There are four 10-acre paddocks. 30 random pasture stick measurements gave an average of 8.5 inches and on average, 2 dots are visible on the stick. The pasture is a mix of orchardgrass, tall fescue and clover. How many days of grazing can be expected in a 10-acre paddock for these 30 beef cows?

- 1. Calculate cow forage need:
 - a. Lactating cow at 3% of body weight in dry matter (DM) per day
 - i. $1350 \times .03 = 40.5 \text{ lbs of DM/day}$
 - b. Single animal DM need x number of animals
 - i. $40.5 \text{ lbs of DM} \times 30 \text{ hd} = 1215 \text{ lbs of DM/day}$
 - c. Alternative method: Total livestock body weight x DM intake %
 - i. $(30 \times 1350) \times .03 = 1215$
- 2. Calculate the amount of forage available in the paddock
 - a. (Total inches – residual inches) x density = forage available to graze
 - i. $(8.5-3.5) \times 250 \text{ lbs DM/inch} = 1250 \text{ lbs of DM}$
 - b. Utilization rate: % depending upon paddock number and management
 - i. $1250 \times .55 = 687.5 \text{ lbs of useable forage DM/acre}$
 - c. Total useable forage in paddock: Useable forage/acre x paddock acres
 - i. $687.5 \times 10 \text{ acres} = 6,875 \text{ lbs of forage DM}$
- 3. Calculate grazing days
 - a. Total useable paddock forage divided by total DM livestock need per day
 - i. $6875/1215 = 5.7 \text{ days}$

Key Points:

- This is an estimate. Don't use this as a final number and walk away from the livestock, there could be errors in measurement, sheep weight, intake %.
- Grass will continue to grow and add dry matter each day.
- Make sure that a residual forage base is left, don't overgraze!
- The utilization rate is dependent upon the frequency of a move to a new paddock and the stocking density, more paddocks and more frequent moves increase the utilization rate.
- Pasture measurements done consistently over time will give information about growth trends that can be used to make management decisions
- Pasture measurement only has value if it is used