

## Forage Moisture Testing<sup>1</sup>

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Y.C. Newman and C. G. Chambliss<sup>2</sup>

There are several methods and pieces of equipment available to estimate forage moisture. The electronic methods are quick but give more variable results than a microwave or forced-air heating unit such as the Koster Tester.

### Microwave Oven

Procedure:

1. Obtain representative sample (whole plants) from swath, silo, or sward.
2. Cut into 1-inch pieces, keeping leaves and stems uniformly mixed.
3. Weigh a microwave-safe dish plus 100 grams (3.5 oz.) of plant sample. It is best to spread sample as uniformly thin as possible. Put a paper towel between the sample and plate to minimize "sweat" from forming on the plate.
4. Put a 10- to 16-ounce covered glass of water in the corner of oven to capture unabsorbed microwaves as the plant tissue dries.
5. Set oven to HIGH for 2 minutes.
6. After 2 minutes, weigh sample and plate and record weight of sample.
7. Change the water and put sample into oven for 2 more minutes. Weigh and record sample weight.
8. Repeat steps 6 and 7 until sample weight remains unchanged or scorching occurs (if scorching occurs, use previous weight).
9. Calculate percent moisture.
 
$$\% \text{ moisture} = [(Wt. \text{ before} - Wt. \text{ after}) \div Wt. \text{ before}] \times 100.$$

Wt. before = Weight of forage before heating  
Wt. after = Weight of forage after heating.
1. Percent dry matter = the last dry weight of sample (assuming 100 grams, starting wet).
2. With experience you can adjust the time periods and decide whether or not it is necessary to use the glass of water. Usually, the above method

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2. Y.C. Newman (editor), assistant professor, Forage Extension Specialist, Agronomy Department, University of Florida C. G. Chambliss, associate professor, Agronomy Department; Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, 32611. Originally written by C.G. Chambliss (deceased).

gives moisture content that is about 2% more than true sample moisture content.

3. For hay, the procedure takes 10 to 20 minutes, depending on initial moisture content of sample.
4. Silage samples take 15 to 25 minutes because of coarser particle sizes and grain content, which dries slower.
5. Practice this procedure several times before the day you really need it, because it takes some experience to fine-tune the procedure.

### Electronic Testers

The most common problems with the electronic probes are related to:

- the need for several probings per bale in order to get an average reading.
- unreliable results because of the varying density of the bale, small sample area, varying texture of the forage, and differences among species.
- erroneous readings when power gets low on battery-operated testers.
- undependable results when estimating moisture in windrow.

To improve reliability, make four to six readings per bale and insert probes into the uncut side of the bale at a 45° angle to horizontal.

### The Grab Test (Squeeze Test)

This test may be used to show the moisture condition of crops standing in the field, lying in the swath or windrow, or chopped in the wagon. Pick up a handful of finely chopped crop and squeeze tightly (with all your strength) for 90 seconds. Release your grip and note the condition of the ball of crop in your hand. The condition of this ball and the dampness of your hand provide an estimate of the moisture content. (See Figures 1-4.)



**Figure 1.** If liquid runs freely or shows between the fingers, the crop contains 75 to 85% moisture.



**Figure 2.** If the ball holds its shape and the hand is moist, the crop contains 70 to 75% moisture.



**Figure 3.** If the ball expands slowly and no dampness appears on the hand, the crop contains 60 to 70% moisture.



**Figure 4.** If the ball springs out in the opening hand, the crop contains less than 60% moisture.