

## MEASURING MOISTURE CONTENT USING A MICROWAVE

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I have been getting lots of questions about measuring the moisture content of a hay crop prior to baling. The moisture content needs to be below 18% before making a round bale. But estimating moisture content can be somewhat difficult. Being off by just a few percent can be the difference between hay molding and not. A little bigger mistake can result in a barn fire.

There are many types of hay moisture probes available. The accuracy of many of these can be affected by forage species, weed content, and bale density. There is a simple way to accurately measure moisture content by using a microwave. Below are the steps to accurately measure the moisture content of a crop prior to baling.

1. Collect sample. Chop hay crop forages into 1 to 2 inch lengths for ease of handling. Grain crop forages must be chopped to 1/2 inch lengths or less.
2. Weigh the container and record scale reading. It is best to use a scale that weighs in grams.
3. Weigh the sample in the container and record scale reading. Subtract the container weight to get the wet weight of sample
4. Spread sample evenly in the container (maximum depth is 1 1/2 inches), but leave a small depression in the center so the forage sample looks a little like a donut. Place a glass of water in the microwave.
5. Place container with sample into microwave and begin drying at high power setting. The wattage of the microwave, evenness of heating (a turntable helps), and amount of material and its moisture content will influence how long to dry the sample. Begin by using short drying periods -- 2 minutes for haylage, silage or fresh material; 1 minute for dry hay. As experience with an individual microwave and forage increases, adjust times accordingly.
6. Remove, reweigh container plus sample, and record the weight. Subtract container weight to get dry weight of sample.
7. Mix the forage, rotate the container and return it to the microwave. Continue drying for 30 seconds if forage is nearly dry, one minute if still moist.
8. Repeat steps 6 and 7 until forage weight does not decrease by more than 1 gram from last weight. If forage starts to char or burn, use the previously recorded weight.
9. Calculate the moisture and dry matter content.

$$\% \text{ Moisture content} = \frac{\text{first sample weight} - \text{last sample weight}}{\text{first sample weight}} \times 100$$