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Agricultural and Biological Engineers



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ASABE, 2950 Niles Road, St. Joseph, MI 49085-9659, USA, phone 269-429-0300, fax 269-429-3852, hq@asabe.org

Moisture Measurement — Forages

Developed by the ASAE Physical Properties of Agricultural Products Committee; approved by Electric Power and Processing Division Standards Committee; adopted December 1972; reconfirmed December 1977; revised April 1979; reconfirmed December 1983; revised by the Physical Properties of Agricultural Products Committee; approved by the Food and Process Engineering Institute Standards Committee December 1988; reaffirmed December 1993, December 1998, December 1999, February 2003, February 2008, revised editorially February 2008; revised May 2012; approved as an American National Standard June 2012; reaffirmed January 2017.

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1 Purpose and Scope

1.1 This Standard establishes uniform methodology for estimating the moisture content of forage materials in various forms. Other techniques, such as Karl Fischer titration and toluene distillation, should be used for more accurate moisture determination.

1.2 Specification of sampling procedures is not within the scope of the Standard. It is assumed that the portion of a collected sample used for moisture content determination is representative of the entire sample. A sample dried at temperatures above 65°C will be of limited value for subsequent chemical analysis.

2 Apparatus

2.1 Sample containers. Sample containers can be one of two types depending on the timing of the initial mass reading.

2.1.1 Nonhygroscopic, moisture proof containers can be used to hold samples provided the volume of contained air is minimized and covers fit tightly. Before use, dry the container for one hour at the drying temperature and obtain the tare mass.

2.1.2 Permeable containers, i.e., cloth or paper bags, can be used provided the initial sample mass is taken immediately. Because these containers may change mass when the sample is oven dried, a small error may occur due to changes in tare mass. This can be overcome by oven drying the sample container and storing it in a moisture proof container, i.e., plastic bag, until the sample is added and immediately weighing the wet sample and dry container.

2.2 Desiccator. If mass readings cannot be taken immediately at the end of the drying period, then place the sample in a desiccator. The desiccator should be airtight and should contain a sufficient exposure of suitable desiccant to quickly lower the relative humidity of its atmosphere after loading.

2.3 Drying oven. The drying oven must be properly ventilated (mechanical convection preferred) and must have temperature sensitivity and uniformity specifications better than $\pm 2^\circ\text{C}$, in the range of 50 to 150°C.

2.4 Balance. Sample mass should be measured to 0.001 g of the total sample mass. Results should be reported using three significant digits.