A RAPID AND SIMPLE METHOD FOR DETERMINING MOISTURE IN FORAGES AND GRAINS

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RECENT advances in agricultural science have intensified the need for a rapid, inexpensive, and fairly accurate method for determining the percentage of moisture in plant materials. Such a method would be of use not only to investigators of many types of forage and cereal problems, but would also enable the farm operator to conduct more efficiently and economically such operations as putting up silage, making hay, harvesting wheat, cutting or husking corn, etc. To fulfill the need of practical agriculture for moisture control in such operations, a method is required which would cover a continuous moisture range of from 10 to 85%, and which could be applied to both grains and forage materials.

LITERATURE REVIEW

So far as the author is aware, there is at present no widely adaptable method for determining moisture in plant tissues that is both rapid enough for practical use and financially within the reach of the average farmer.

The standard method for determining percentage moisture in plant tissues is to measure the loss in weight after heating the material in a hot air oven (1). The time required varies from 1 hour to 3 days, depending on the temperature used and the fineness of subdivision of the sample. Such determinations obviously are not well adapted to practical use on the farm.

The method of determining moisture by distillation with toluene (1) is satisfactory in accuracy but impractical because of the time and equipment required.

An apparatus which is designed to force heated air through the plant material is now commercially available and is sufficiently rapid and accurate for moisture determinations on forage materials but involves the use of equipment which the average farmer is either unable or unwilling to purchase. Monroe and Perkins (12) have reported favorably on the speed and accuracy of such an apparatus.

The Tag-Heppenstahl electric moisture meter (4) is satisfactory if the material is of uniform moisture content but requires expensive equipment and is limited in use to small grains and shelled corn of from 7 to 31% moisture. This method is sufficiently accurate for most practical purposes over the moisture range ordinarily encountered in commercial grain.

Featherstone (6) has recently reported on a rapid laboratory procedure for the determination of moisture in plant materials. This method is based upon the rise in temperature which results when plant material is mixed with concentrated sulfuric acid and is used most successfully in the moisture range of from 15 to 50%.

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3 Figures in parentheses refer to "Literature Cited", p. 334.

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