

November 2006

Grain Moisture Meter (GMM) Series
Part 1 – Overview of GMM Series Topics

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The NIST Weights and Measures Division is nearing completion of a new field manual for the evaluation of commercial grain moisture meters (GMMs). As a preview to this manual and to provide weights and measures officials with information to increase awareness of GMMs, a series of articles will be provided in the *Weights and Measures Quarterly* to give an overview of the economic impact of GMMs and provide a preview to the field manual by discussing the various aspects of measuring moisture in grain. This article (Part 1) outlines the subjects included in the series and provides highlights of each part.

Part 2 - Economic Impact. Although few in numbers compared to other commercial devices, GMMs have a high dollar impact per device. Part 2 will explore the amount of grain measured, the value of grain measured by GMMs in the United States, and the potential monetary loss due to inaccuracies in these meters.

Part 3 - Grain Moisture Meter Measurement Technology. Currently, two technologies—dielectric and near infrared—are used in commercial devices in the United States to measure grain moisture. GMMs measure an optical or electrical property of the grain. When these optical or electrical properties are compared to known grain moisture values, a calibration for the grain can be developed. Based on this calibration, the device can provide a moisture reading related to the measurement of the optical or electrical property of that grain. The September 2006 *Weights and Measures Quarterly* article, “What do Grain Moisture Meters Measure and How are They Calibrated?” addressed the dielectric technology. Part 3 of this series will review near infrared technology.

Part 4 - Field Test Methods, Testing Apparatus and Equipment. The most widely used test method for the evaluation of GMMs in the United States uses grain as the transfer standard. Unlike other commercial devices, the standards used to test moisture meters are biological samples that require preparation and care to maintain. There are various types of equipment and apparatus needed to test GMMs, including storage and transport containers, temperature measuring devices, and refrigeration. Part 4 of this series will review the maintenance of grain transfer standards and the apparatus and equipment needed to test these devices.

Part 5 - Field Inspection and Test. Commercial GMMs, as with other commercial devices are inspected and tested in accordance with NIST Handbook 44. Specific test procedures are now included in the new field manual. The February 2004 *Weights and Measures Quarterly* article “Testing Grain Moisture Meters” provided some guidance in testing GMMs. Part 5 of this series will elaborate on the Evaluation Procedure Outline and test procedures included in the new GMM field manual.

Part 6 - *Laboratory Grain Sample Preparation*. Grain transfer standards are developed in a laboratory. The laboratory must follow appropriate grain handling, collection and cleaning procedures along with having the appropriate equipment and laboratory environment to ensure grain transfer standards are adequate and available for GMM testing. Part 6 of this series will review Appendix C of the new field manual that includes laboratory procedures, equipment, and facilities needed to develop grain transfer standards.

Hopefully, this series of articles will increase State awareness of GMMs, facilitate the use of the new GMM field manual, and provide those States which have a high grain production and possible high monetary loss due to inaccuracies in GMMs with the tools needed to develop a GMM testing program in their State.

If you have any questions, comments, or suggestions on other grain moisture topics that you would like to see covered in the upcoming series, please contact G. Diane Lee by e-mail at diane.lee@nist.gov.