What is UGMA?

FGIS’s **Unified Grain Moisture Algorithm**
1. Measure dielectric constant at frequency near 149 MHz
2. Density correction
3. Unifying parameters
4. Single calibration equation
5. Temperature correction
6. Gives accurate moisture results
Why Change to UGMA?

1. Better accuracy for all grain types
2. Much better accuracy on corn
   Special test weight correction
3. Less affected by “green grain” conditions
4. Faster
5. More stable calibrations
6. Wider temperature ranges
7. Allow competition for Official moisture meters
UGMA Master System
FGIS-Certified UGMA-Compatible Moisture Meters

Dickey-john GAC 2500UGMA

Perten AM 5200-A
FGIS’s Basic Definition of Equivalency

1. Same technology
2. Very close agreement among types as well as units of a type
3. Same calibrations and standardization processes
UGMA-Compatibility Criteria (1)

1. NTEP Certification
2. Documented & stable production processes
3. Measurement frequency
4. Standardized test cell design
5. Standardized loading method
6. Standardized measurements
   • Sample dielectric constant
   • Sample mass
   • Sample temperature
UGMA-Compatibility Criteria (2)

1. Tight tolerances specified for individual subsystems as well as moisture results

2. Must use specified mathematics

3. Units’ agreement with FGIS Master system must meet tolerances in FGIS Regulations
   - ± 0.05% Moisture for Headquarters Standard units
   - ± 0.15% Moisture for other Official units
   - Mean difference on medium-moisture HRWW
UGMA-Compatibility Criteria (3)

1. All UGMA-Compatible models must be able to use the same check testing process.

2. A simple check testing process must ensure performance on all grains over full moisture ranges.

3. Instruments must provide for efficient means of entering calibrations.

4. Instruments must provide standardized output data stream for printing or networking.
Improved Accuracy of UGMA

![Bar chart showing variability (SDD % Moisture) for different crops and methods. The methods compared are GAC 2100 vs. Air Oven and UGMA Master vs. Air Oven.](chart.png)
Improved Accuracy of UGMA
Excellent Agreement Between UGMA Models
Excellent Agreement Between UGMA Models

Check Testing Tolerance for Official Moisture Meters

Variability (SDD %Moisture)

Wheat, Hard
Wheat, Hard
Wheat, Hard
Wheat, Soft
Wheat, Red
Wheat, White
Wheat, Winter
Wheat, Spring
Durum
Barley
Oats

GAC2500 vs AM5200
UGMA Unit to Unit
Far Better Agreement Than Between Different Technologies
Far Better Agreement Than Between Different Technologies
Summary

1. UGMA developed by FGIS to meet grain industry demands for higher accuracy and consistency and competition among Official moisture meter providers.

2. UGMA-Compatible moisture meters have been made equivalent by design and confirmed equivalent by GIPSA’s engineering review.

3. FGIS, Official agencies, and grain handlers can confidently use all FGIS-Certified UGMA-Compatible moisture meter models interchangeably.