Density Correction Effects for Corn with UGMA and GAC 2100

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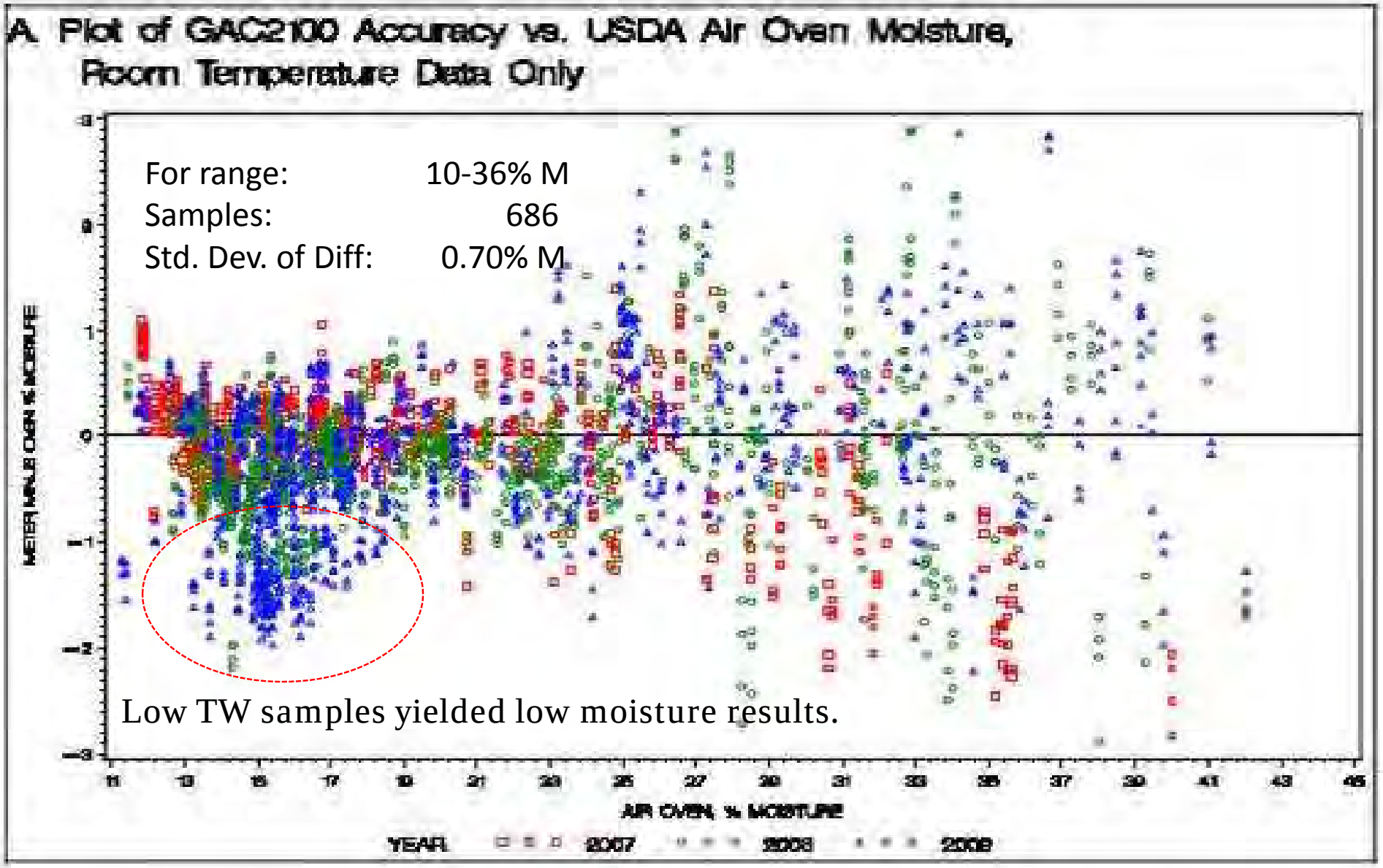
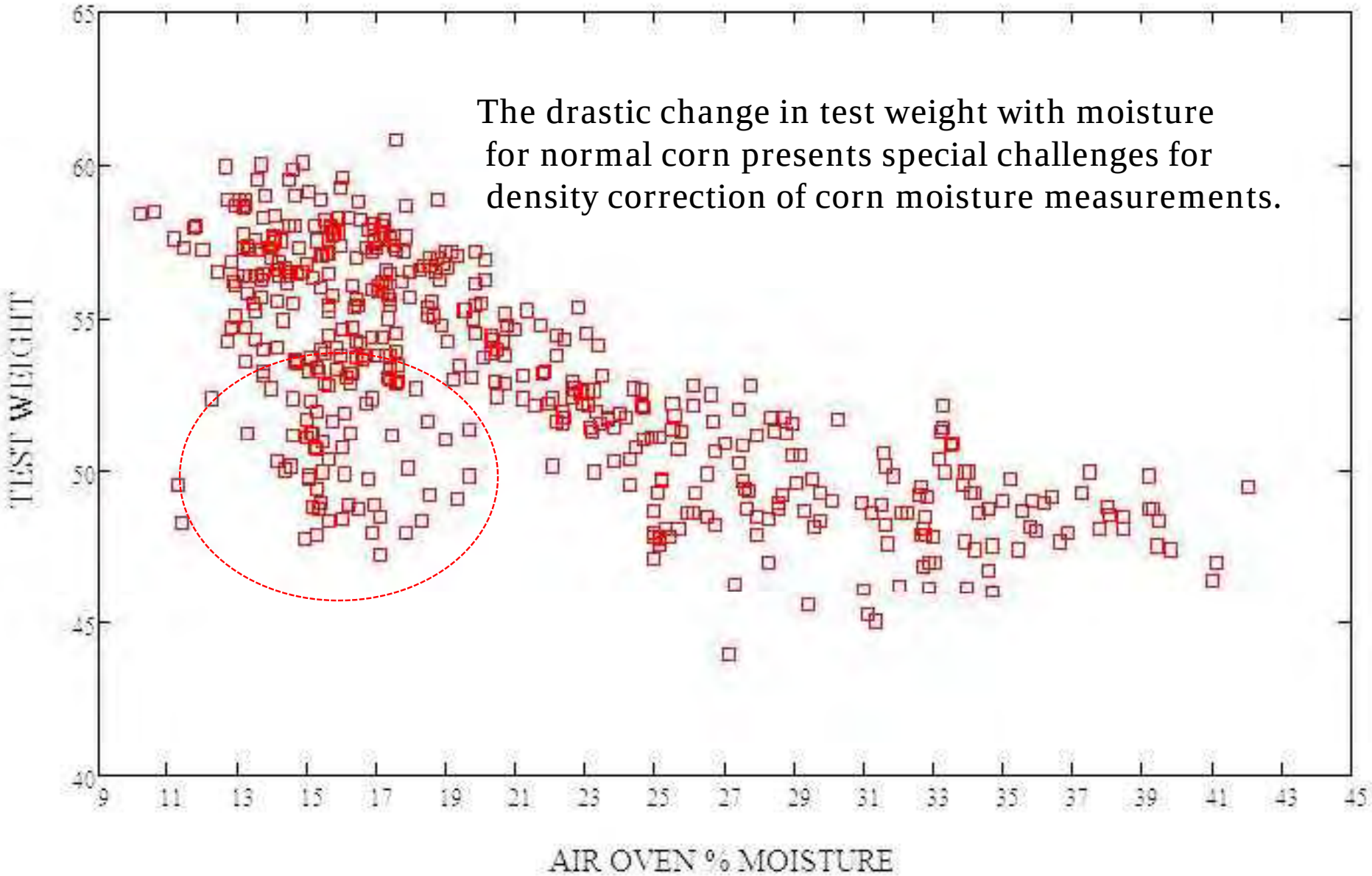
GAC 2100 Corn Results—Density Issue

Accuracy for 2007-2009 Crops



Corn: Official Test Weight vs. Air Oven Moisture



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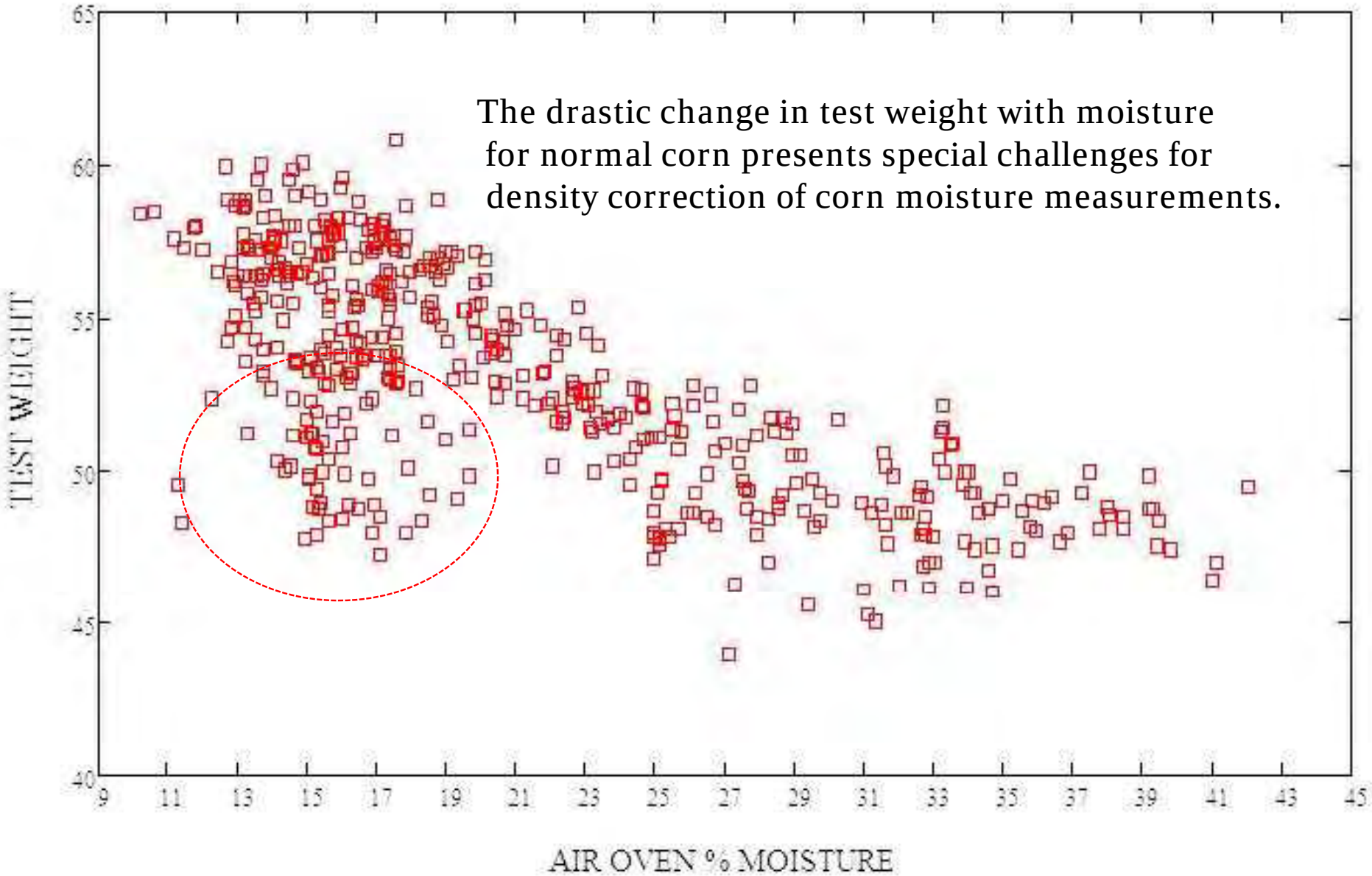
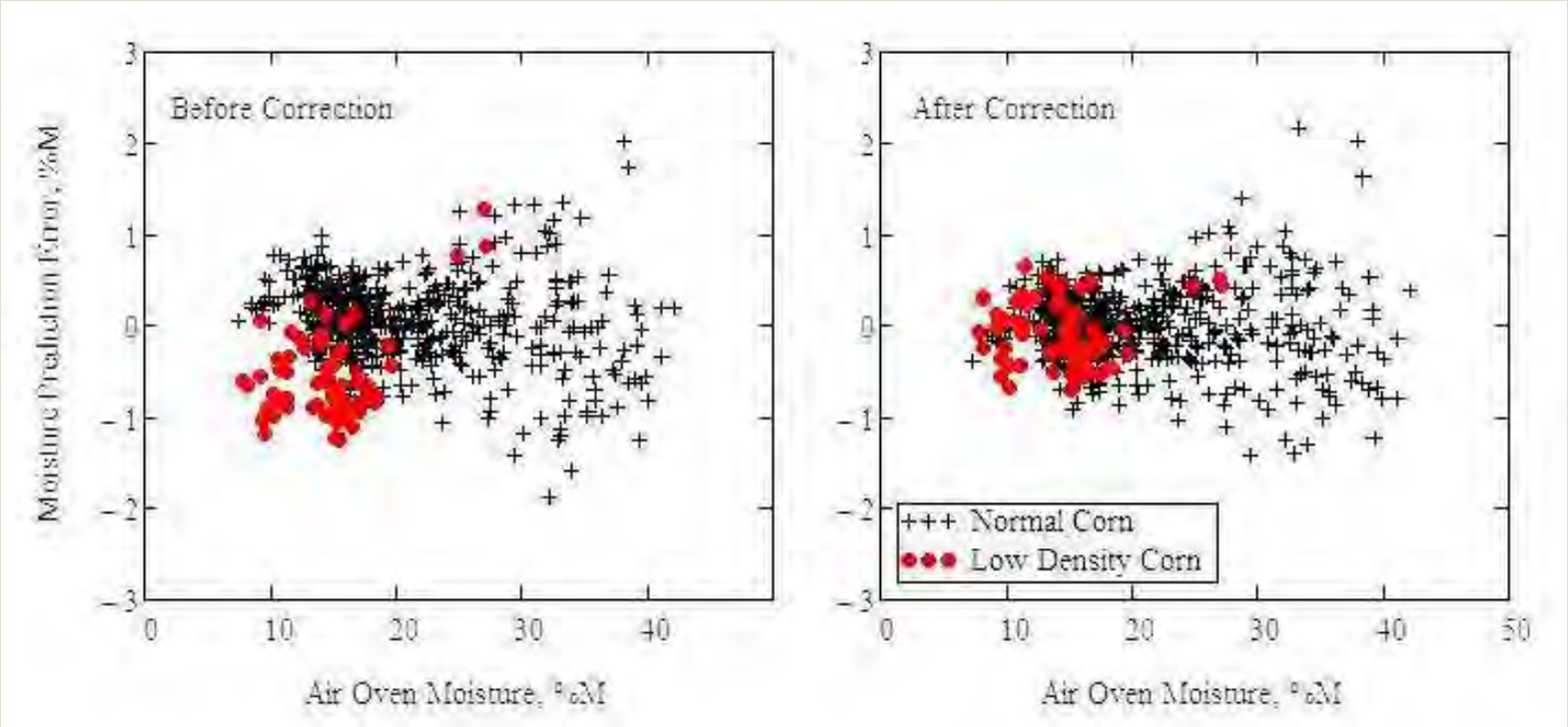


Secondary Density Correction

149 MHz Corn Results for 149 MHz (UGMA)



Before	Bias	STD	Slope
All Samples	-0.04	0.46	-0.01
Low Density	-0.66	0.34	0.00
Normal	0.09	0.36	-0.04

After	Bias	STD	Slope
All Samples	-0.01	0.31	-0.01
Low Density	-0.11	0.32	-0.03
Normal	0.01	0.30	-0.01

Secondary Density Correction

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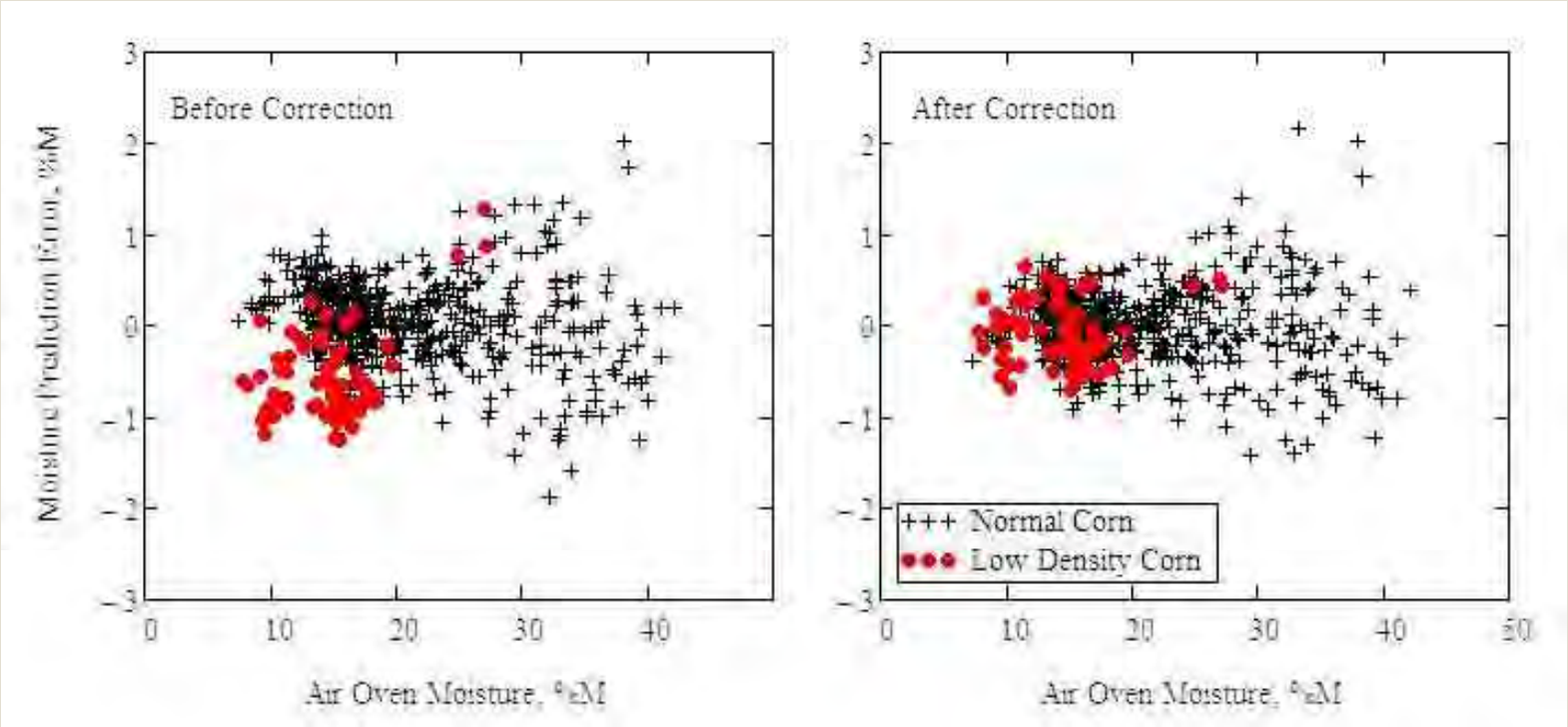

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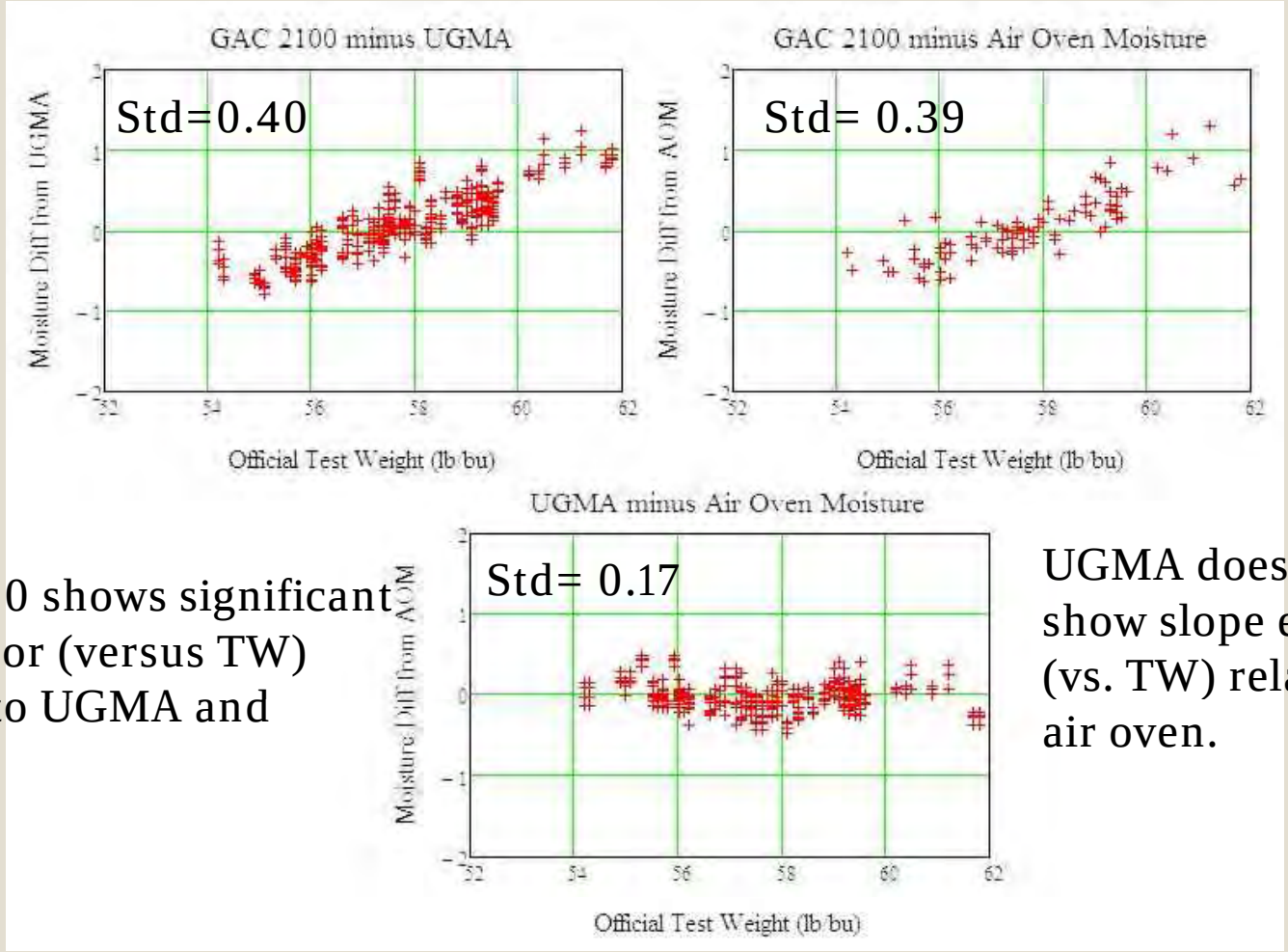
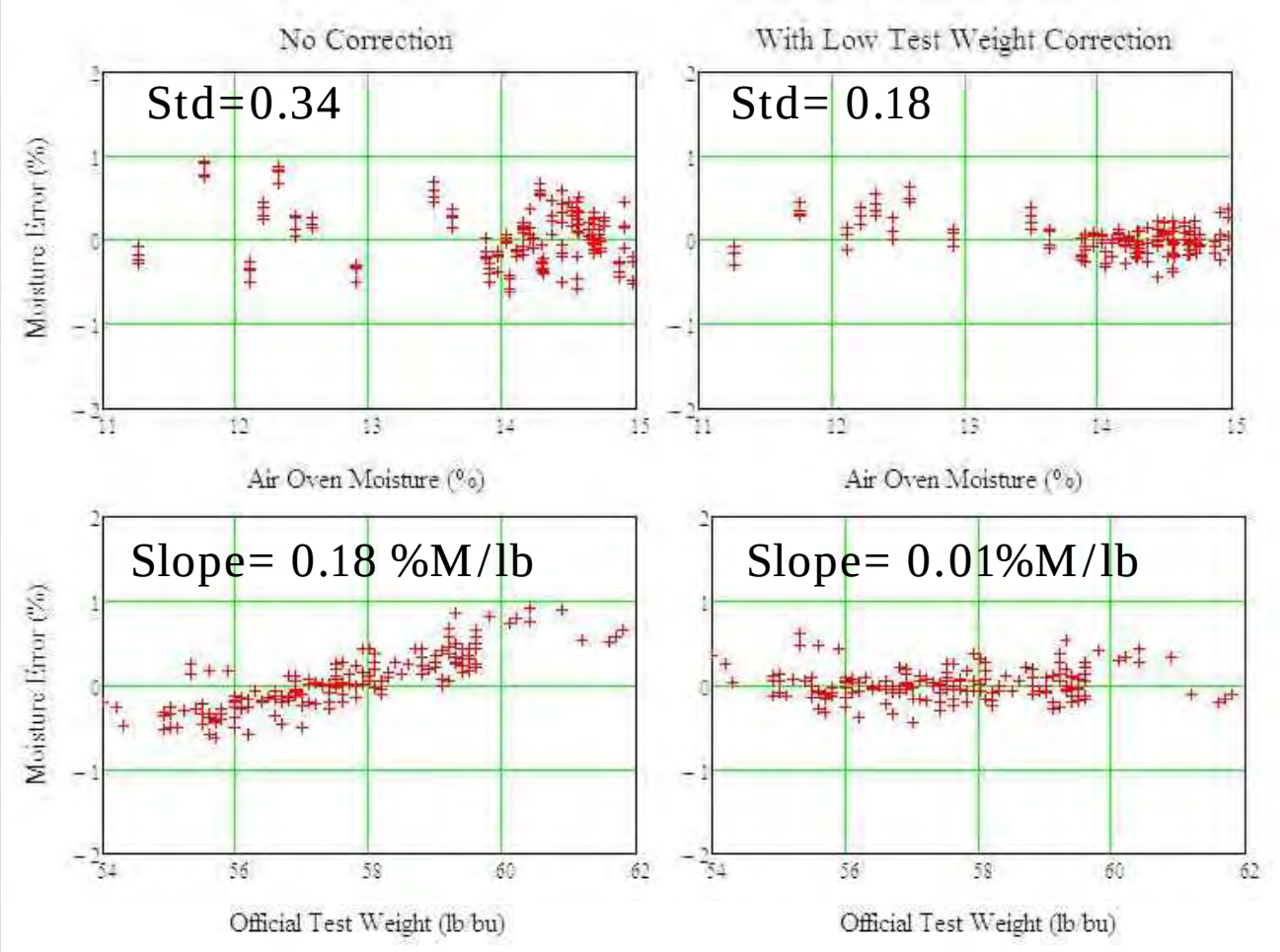
GAC 2100 and UGMA (<15%)



GAC 2100 shows significant slope error (versus TW) relative to UGMA and air oven.

UGMA does not show slope error (vs. TW) relative to air oven.

GAC 2100 (<15%M)


No Correction
With Low Test Weight Correction
Std=0.34
Std= 0.18
Moisture Error (%)
Air Oven Moisture (%)
Slope= 0.18 %M/lb
Slope= 0.01%M/lb
Official Test Weight (lb/bu)

Conclusions Regarding Secondary Density Correction for Corn

- Corn samples with very high or very low densities show significant moisture prediction errors with GAC 2100.
- Secondary density correction for UGMA successfully reduced the moisture prediction error due to density differences—not only for the extreme density samples.
- A mathematical secondary density correction would be effective for the GAC 2100, but implementation is impractical.
- Expediting implementation of UGMA would minimize market disruptions from density-dependent moisture measurements.

Benefits of 149 MHz Technology

- Improved accuracy (including density effects)
- Provide competition
  - Control costs
  - Equivalent results from multiple instrument models
- Expanded cold temperature range (down to 0 °F)
- Faster operation
- Better stability over time and crop conditions
  - Fewer calibration changes to cause market disruptions
  - Avoid density-induced discrepancies
- Easier calibration development

Costs of New Moisture Technology

- Replacement costs
  - 104 units owned by FGIS
  - 627 units total in Official inspection system
- Temporary market disruptions during changeover