

# Inspection Instrumentation Branch Updates



**GRAIN INSPECTION ADVISORY COMMITTEE**

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CHIEF, INSPECTION INSTRUMENTATION BRANCH  
APRIL 7, 2015**



United States Department of Agriculture

# USDA Rice Studio



## July 2014 Resolution -

The Advisory Committee recommends that GIPSA continue its work to utilize technology enhancements to advance efficiencies for grain inspections. For example, GIPSA should continue its work with the USDA Rice Studio (rice scanner project) by connecting with industry stakeholders for feasibility of using the technology for further evaluations: including rice broken sizing, color, and potential uses with other grains.



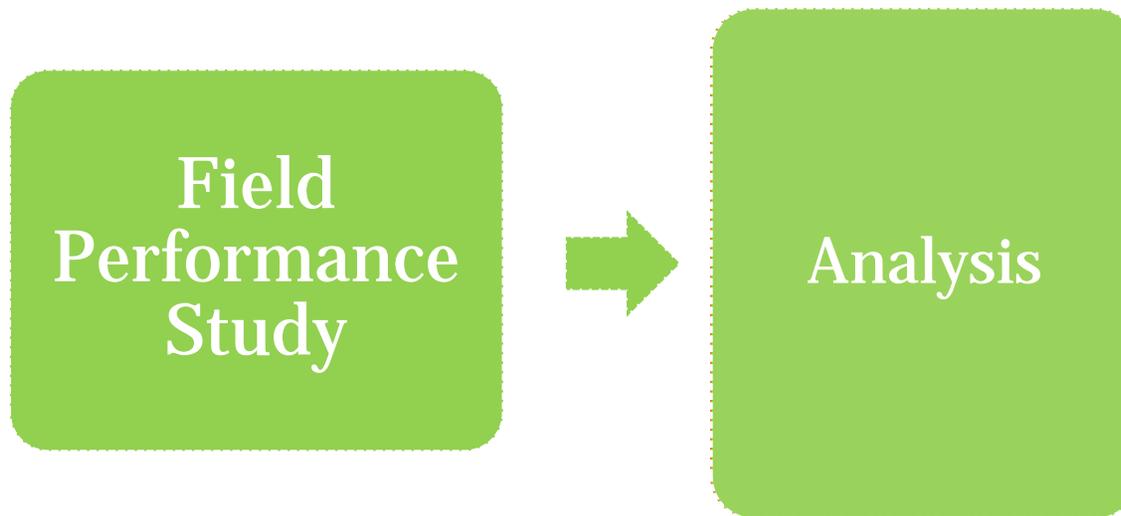
# USDA Rice Studio – Development Timeline



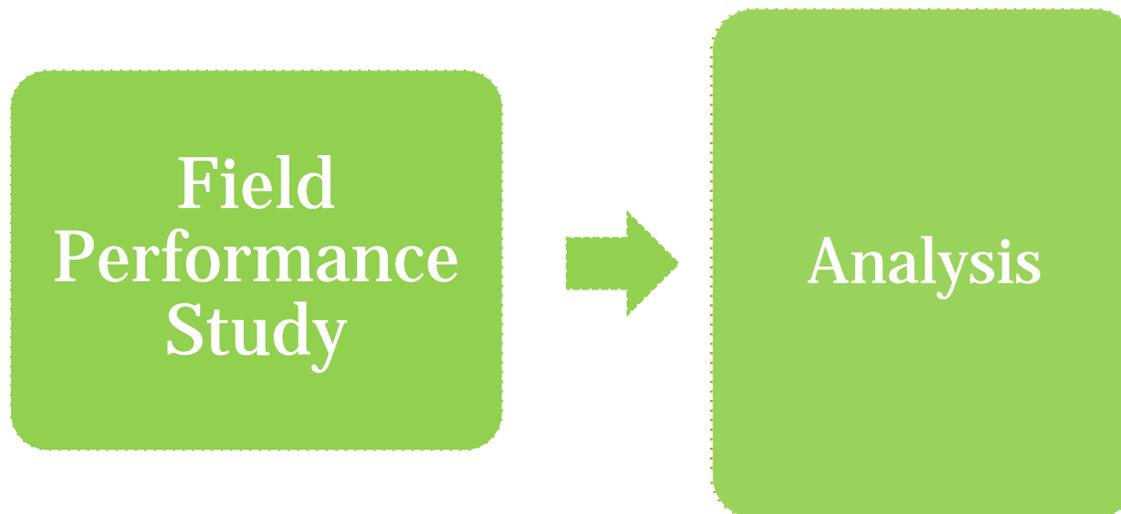
Field  
Performance  
Study



# USDA Rice Studio – Development Timeline



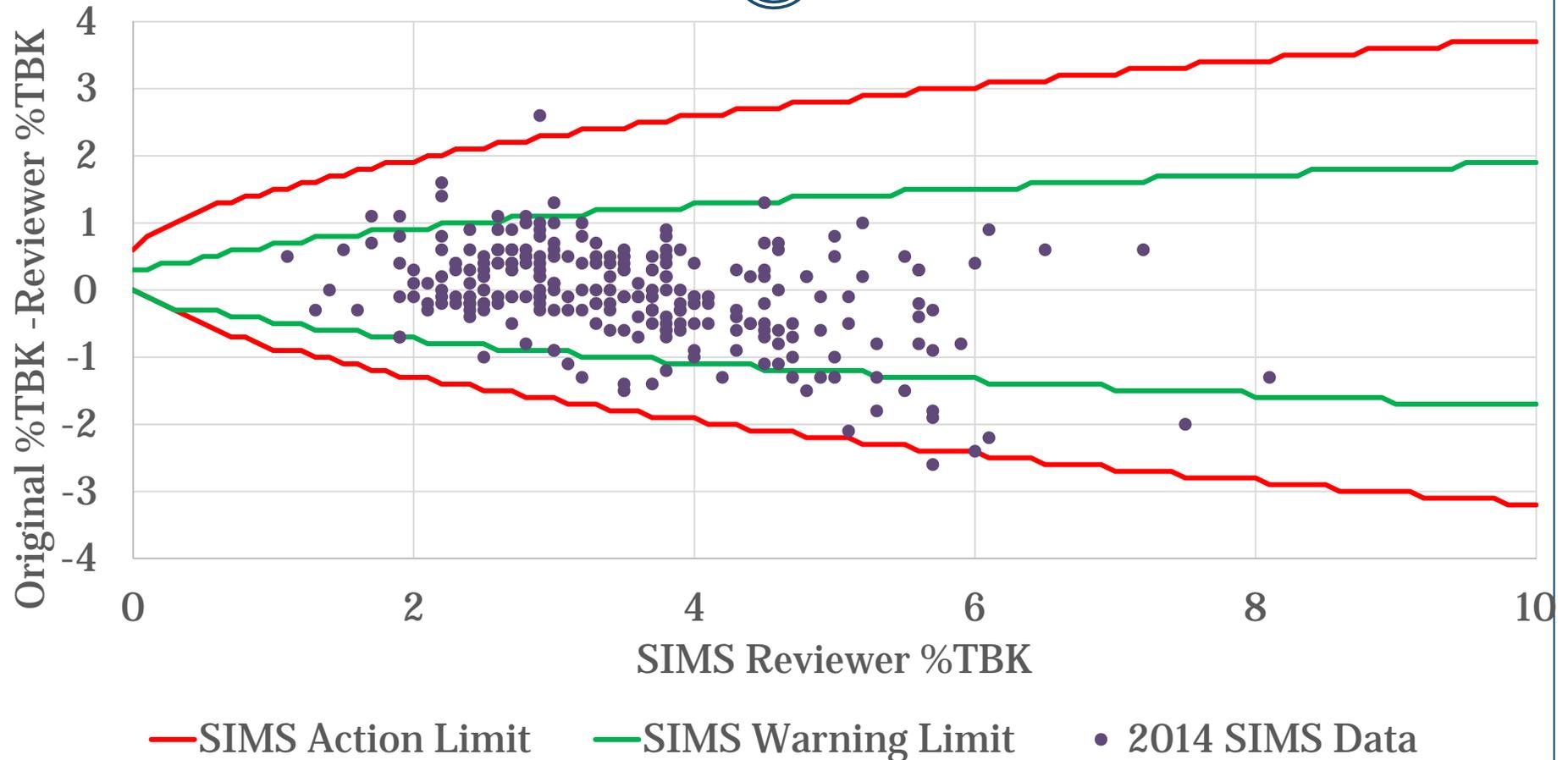
# USDA Rice Studio – Development Timeline



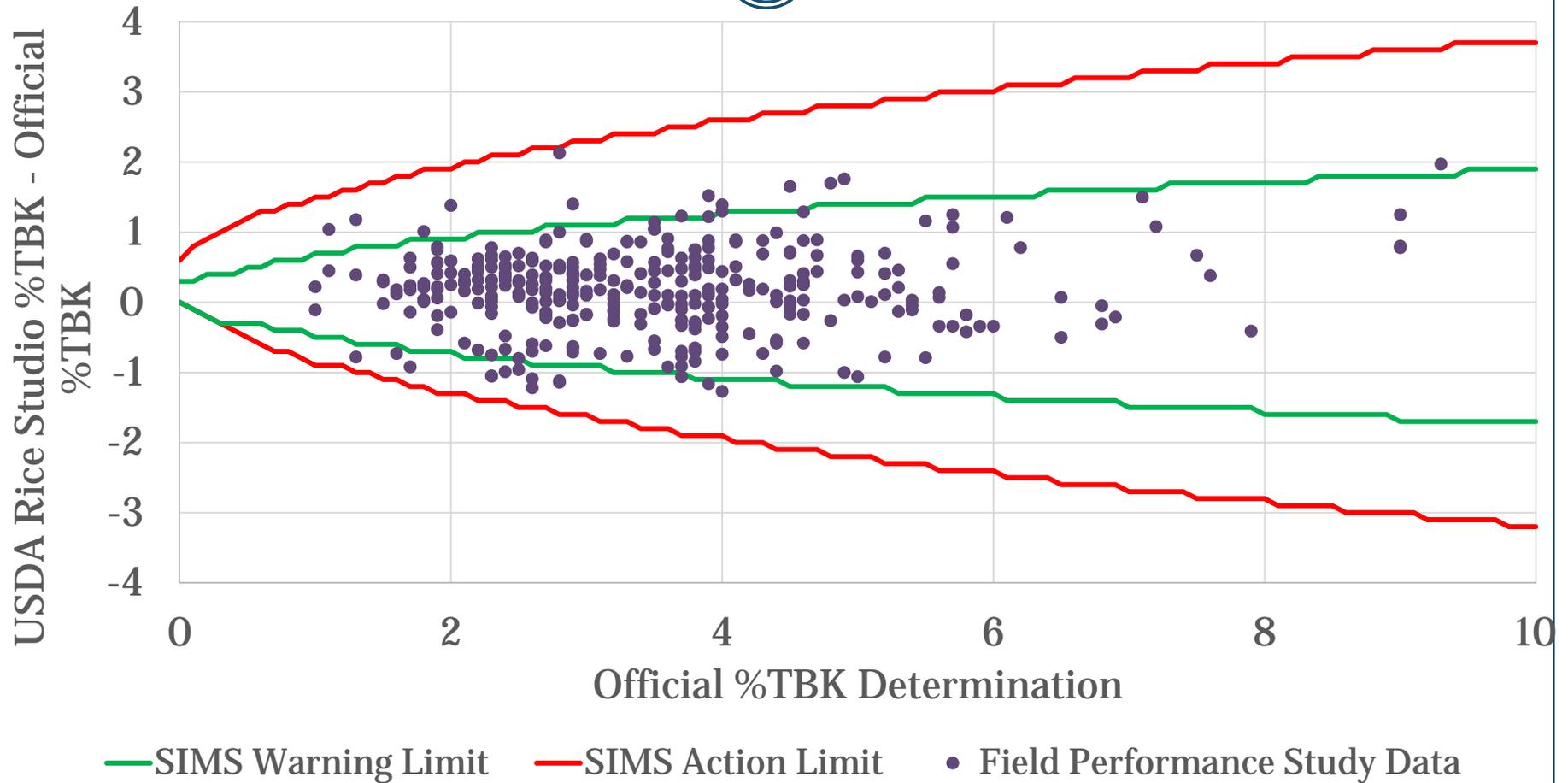
**Long Grain Milled Rice (LGMR)  
% Total Broken Kernel (TBK)  
Performance**



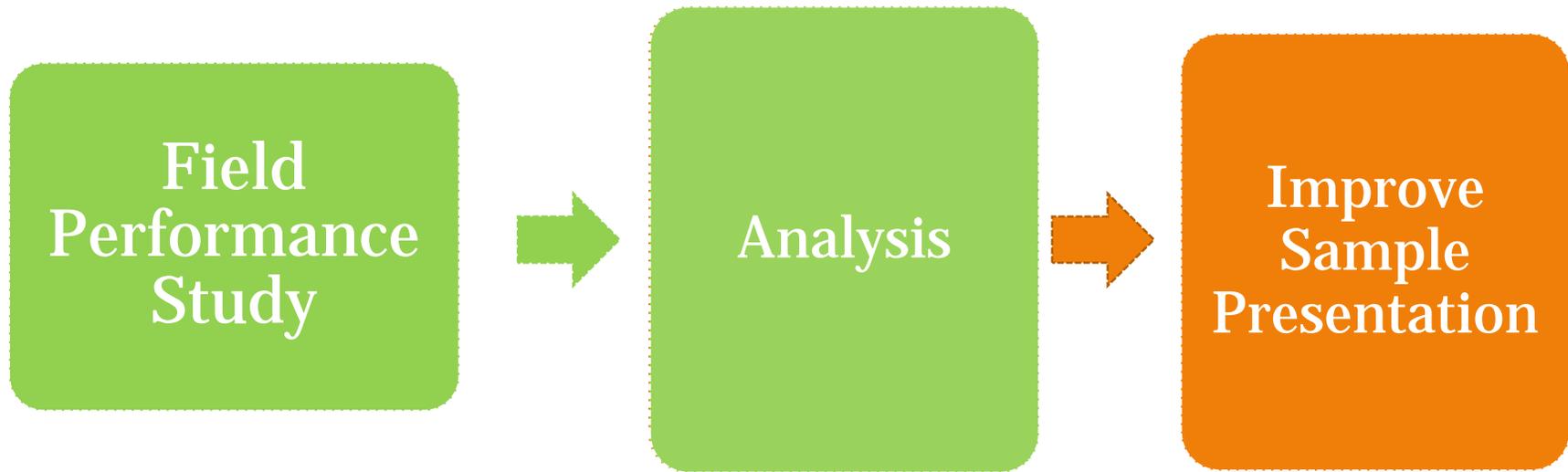
# Sample Inspection Monitoring System



# USDA Rice Studio Field Performance Study



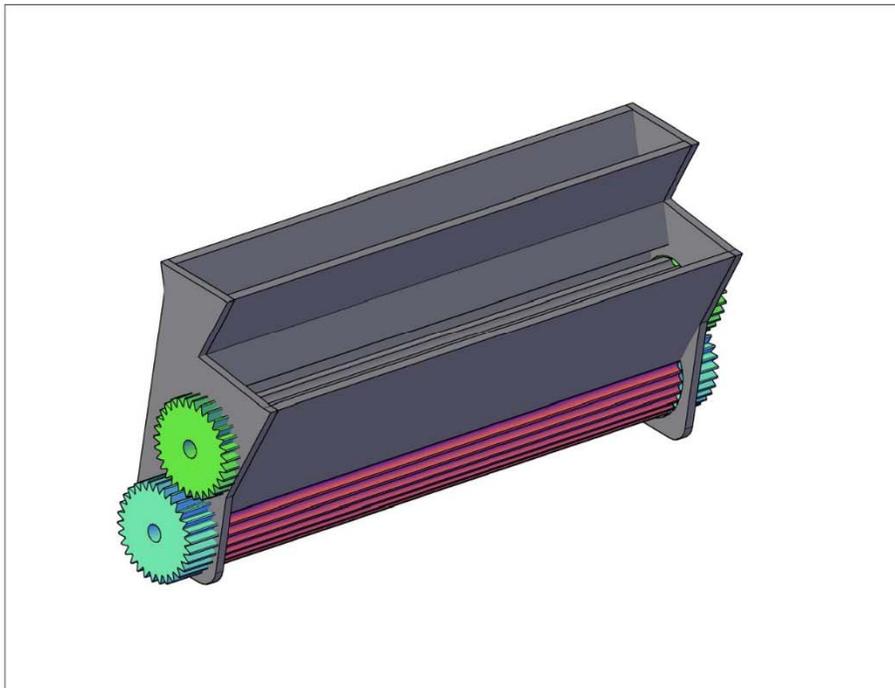
# USDA Rice Studio – Development Timeline



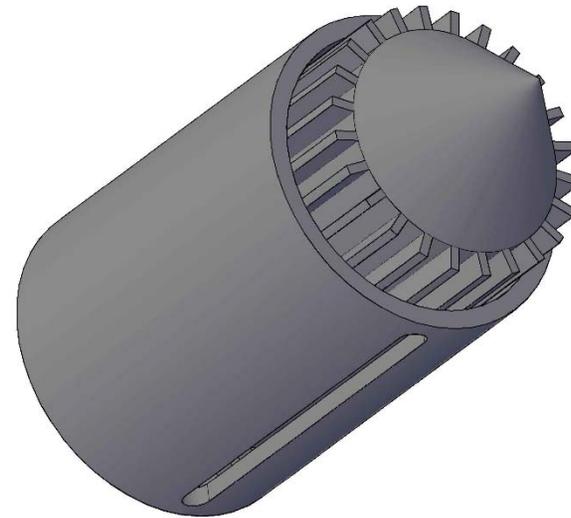
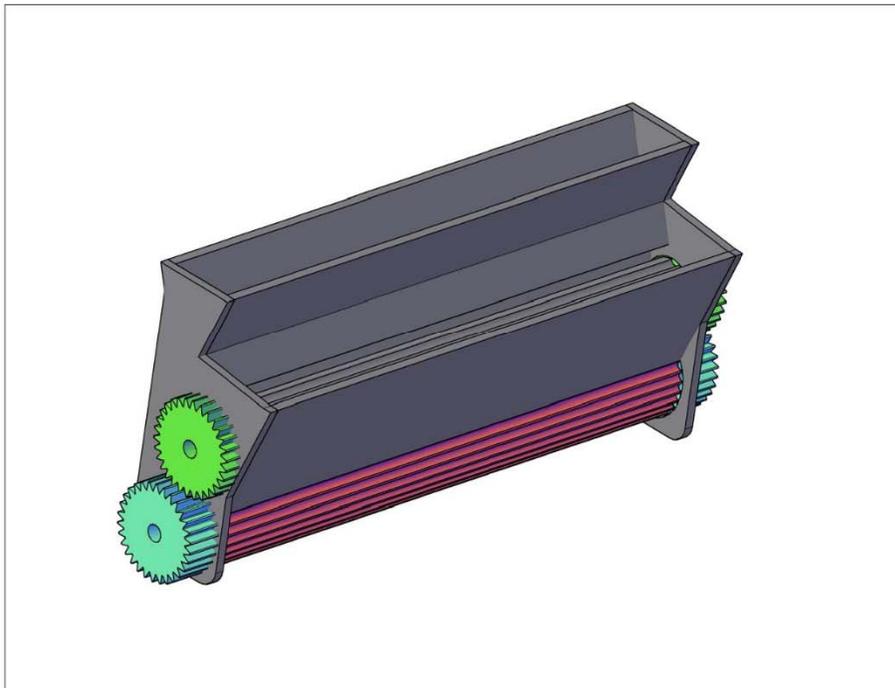
**Long Grain Milled Rice (LGMR)  
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# USDA Rice Studio Sample Presentation Options



# USDA Rice Studio Sample Presentation Options



# LED Lighting



July 2014 Resolution –

The Advisory Committee recommends that GIPSA continue its work with updating inspection lab lighting standards. Lab lighting is crucial for proper visual quality analysis. Advancements in LED technology and lower overall cost should prove this technology a suitable replacement for current approved lighting technology.



# Update on LED Lighting Project



- Obtained LED with 10,000 °K color temperature
- Layout design in process to achieve current lighting requirements
  - Color Rendering Index (CRI)  $\geq 92$
  - Color Temperature 7500 °K



# Condensation Effects Study



**November 2014 Resolution –**

**The Advisory Committee recommends that FGIS conducts a comprehensive investigation of moisture and test weight fluctuations that may result from condensation that may occur at two specific points in the grain marketing process – the first one from point of origin to point of destination and the second is from point of destination to point of shipping.**



# Point of origin to point of destination



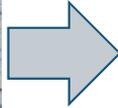
**Load barge  
upriver (official  
or unofficial)**



# Point of origin to point of destination



**Load barge  
upriver (official  
or unofficial)**



**In transit**



**Unload barge at export  
elevator (typically  
unofficial)**



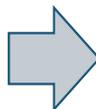
# Point of destination to point of shipping



Grain moving from elevator to ship



Sampled for official inspection



Loading export shipment (official)



# Condensation Effects Study



- **Conduct study comparing samples tested**
  - Under condensing conditions with current grain delivery system to onsite inspection lab
  - Under non-condensing conditions with current grain delivery system to onsite inspection lab



# Feasibility of UGMA TW Determinations



November 2014 Resolution –

The Advisory Committee recommends that FGIS continue to investigate the feasibility of using UGMA-compatible moisture meters for determining test weight for Official inspection.



# Bases of Determination

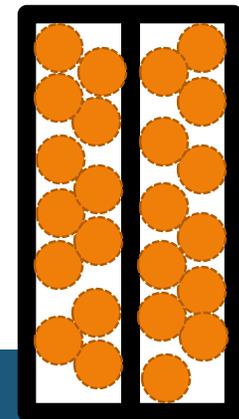
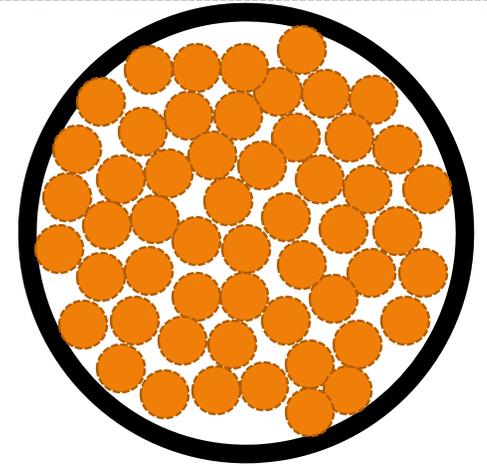


Group	Grade-Determining	Moisture	Test Weight
Barley	Yes	With dockage	Remove dockage
Corn	Yes	With BCFM	With BCFM
Oats	Yes	With FM	With FM
Rough Rice	No	With dockage	With dockage
Sorghum	Yes	With dockage	With dockage
Soybeans	No	With FM	With FM
Sunflower Seed	Yes	With FM	Remove FM
Wheat	Yes	With dockage	Remove dockage



# Quart Kettle and UGMA-based TW - not “Technically Equivalent”

- Vessels are significantly different in shape and size
  - Different surface area to volume ratios
- Filling and strike-off are different
- Moisture meters require grain-specific mathematical adjustments to agree *on the average* with official test weight.
- Optimum adjustments depend on many factors that may not be stable over time or regions.
- Sample-to-sample differences may be large.



# If UGMA Meters Used for Test Weight

- Improve adjustment factors to align meters to quart kettle
- Improve agreement between models



# Feasibility of UGMA TW Determinations



Moisture  
Calibration  
Data

- 2012 – 2014 crop year data on both models and test weight apparatus

Common Basis of  
Determination

Met with  
manufacturers

GIPSA to  
review

- March 18, 2015



# Investigate Use of Quadcopter for Stowage Examinations



- Safety
- Camera to document conditions
- Potential to add equipment/sensors for additional tests



United States Department of Agriculture

Questions? Comments?



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