S-Series Combine and Front End Equipment Optimization

“Ready to Harvest” Corn Grain Damage

John Deere Harvester Works
Preface

Enclosed is a checklist of items to inspect for Corn Grain Quality to record machine configurations, settings and crop conditions.

Also enclosed in this material are instructions to help you understand how to measure percent of grain damage and percent of fines in a given sample of corn.

Use this document to edit and answer any questions and also submit this form attached to a DTAC case for follow up if necessary.
Checklist Questions for Grain Quality - Combine and Cornhead

Customer Name_________________________
Serial number___________________________
Separator Hours_________________________
Header Size_____________________________

Configuration:
Concave Round Bar(Y/N)?__________________
Deep Tooth DZ Chaffer(Y/N)?_______________
Deep Tooth Sieve(Y/N)?___________________
Aftermarket parts Installed?
   Separator?______________________________
   Cleaning Shoe?________________________

Feed Accelerator Wear Strips
   Smooth?_______________________________
   Sweptback?___________________________
   Standard?____________________________
Front Tire Size?________________________

Settings:
Feederhouse sprocket (22/26/32T)?___________
Feed Accelerator Speed(Low/High)?___________
Rotor Speed?_____________________________
Concave Clearance?_______________________
Fan Speed?______________________________
Chaffer Opening?________________________
Sieve Opening?__________________________
Dual Zone Opening?_______________________

Cornhead:
Deckplate Spacing?_______________________
Backshaft Speed?________________________
Auger up or Down?_______________________
Ground Speed?___________________________
Crop and Conditions:
Seed Variety?_____________________________
Yield?___________________________________
Moisture?________________________________
Test weight?______________________________
Black Layered (>28%)?_______________________
Number of kernels around ear?_______________
Number of kernels length?__________________
Green Leaves?____________________________

Issue:
Cracked and Broken Kernels (Y/N)?___________
  Percentage?______________________________

Fines(Y/N)?________________________________
  Percentage?______________________________

Foreign Material (cob, trash) (Y/N)?___________
  Percentage?______________________________

Issue in all varieties(Y/N)____________________

1st year this is a problem(Y/N)?______________

Where is damage sample taken from (Y/N)?
  Combine?_______________________________
  Grain Cart?____________________________
  Truck?_______________________________
  Dryer?_______________________________
  Dry Bin?_____________________________
  Grain Elevator?_________________________
Corn Grain Damage Grading Procedure

Conducted according to the USDA grain inspection handbook

Collect a sample by sweeping a bucket under the grain tank or unloading auger with a steady flow. Target a 1kg (2.2 lbs.) sample size.

Weigh out the total sample. DO NOT separate as fines tend to settle to the bottom.

Shake the sample in a 12/64 inch round hole sieve (USDA standard) for @ 1 minute.
Weigh out what passes through the screen. This is fines and is considered dockage at the elevator. 

Weight of the fines / weight of the sample = % of fines

From the original 1kg. (2.2lb.) sample manually separate and weigh kernels that are broken or have a damaged seed coat above the black layer.

Weight of damaged kernels / total sample weight = % damage

Total damage Fines + Broken Kernels should be 3% or less.
Examples of Damaged Kernels
These are kernels that have mechanical damage above the black layer. Cracks must go through the seed coat enough to cause the kernel to be broken with fingers. Kernels damaged by insects do not count.
Examples of not damaged Kernels

Insect damage only

Hair line crack not through the seed coat

Only the germ knocked off, no damage above the black layer

Grades and Grade Requirements

§ 810.404 Grades and grade requirements for corn.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Minimum test weight per bushel (pounds)</th>
<th>Maximum limits of:</th>
<th>Broken corn and foreign material (percent)</th>
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<tr>
<td></td>
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<td>Damaged kernels</td>
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<tr>
<td></td>
<td></td>
<td>Heat damaged kernels (percent)</td>
<td>Total (percent)</td>
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<tr>
<td>U.S. No. 1</td>
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<td>0.1</td>
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