Still the 2009 Crop and now 2010 Corn & Soybeans

GEAPS Greater Iowa Chapter

Dr. Charles R. Hurburgh, Jr.
Agricultural and Biosystems Engineering
Iowa State University
September 14, 2010
2009 Weather Events, Quality

• Reduced heat units over summer
  – Delayed development rates but total good
  – Assured wet corn but...

• Warm late Aug, early Sep.
  – Brought crops along (Could have been worse!!)
  – Cost 2-3 lbs of test weight
Weather Events and Quality

• Then a slow cool late Sep/Oct.
  – Put the brakes on drydown
  – Created wet soybeans
  – 20-30% corn

• Then a warmer November
  – Bailed out the soybeans (field or bin)
  – Some help to the corn (~20-23%)

• The beat went on: warm, humid July, August. **BLUE EYE**
Wet Corn!
Hail damage, Sac County, 8-09-2009

Photos courtesy: Mark Licht, ISU Extension
Ear rot assessments – percent severity; rot present

- Gibberella
- Cladosporium
- Fusarium
- Penecillium
- Trichoderma
Corn, NE Iowa, January 2010
# Ear Rot Summary

<table>
<thead>
<tr>
<th></th>
<th>Mean ear rot severity (%)</th>
<th>Ear rots present</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Range)</td>
<td></td>
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<tr>
<td>Hail damage samples (N=56)</td>
<td>11.8</td>
<td>Fusarium*</td>
</tr>
<tr>
<td></td>
<td>(0 – 53.4)</td>
<td>Gibberella*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cladosporium, Penicillium</td>
</tr>
<tr>
<td>Background samples (N=27)</td>
<td>3.3</td>
<td>Cladosporium*</td>
</tr>
<tr>
<td></td>
<td>(0 – 16.4)</td>
<td>Fusarium, Gibberella</td>
</tr>
<tr>
<td>Standing corn samples (N=72)</td>
<td>24.0</td>
<td>Cladosporium*</td>
</tr>
<tr>
<td>(No increased toxin)</td>
<td>(0.2 - 83.8)</td>
<td>Fusarium, Gibberella</td>
</tr>
</tbody>
</table>

* Predominant ear rot present
### Maximum storage time (months) for corn and soybeans*

<table>
<thead>
<tr>
<th>Corn temperature °F</th>
<th>Corn, soybeans moisture content</th>
<th></th>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>13%, 11%</td>
<td>14%, 12%</td>
<td>15%, 13%</td>
<td>16%, 14%</td>
<td>17%, 15%</td>
<td>18%, 16%</td>
<td>24% N/A</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>150</td>
<td>61</td>
<td>29.0</td>
<td>15.0</td>
<td>9.4</td>
<td>6.1</td>
<td>1.3</td>
<td></td>
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<tr>
<td>50</td>
<td>84</td>
<td>34</td>
<td>16.0</td>
<td>8.9</td>
<td>5.3</td>
<td>3.4</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>47</td>
<td>19</td>
<td>9.2</td>
<td>5.0</td>
<td>3.0</td>
<td>1.9</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>26</td>
<td>11</td>
<td>5.2</td>
<td>2.8</td>
<td>1.7</td>
<td>1.1</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>15</td>
<td>6</td>
<td>2.9</td>
<td>1.6</td>
<td>0.9</td>
<td>0.9</td>
<td>0.06</td>
<td></td>
</tr>
</tbody>
</table>

*Based on 0.5% maximum dry matter loss—calculated on the basis of USDA research at Iowa State University. Corresponds to one grade number loss; 2-3% pts in damaged seeds Soybeans approximated at 2% lower moisture than corn.
Blue-eye; Penicillium or A. Glaucus
Any time you have EMC balanced with 65% RH, Blue Eye is possible.
Climate Variability

• 2008 was nearly the same as 2009, just a little better at the end.

• Regional climate models (WCB):
  – Warmer **over the whole year**
  – Wetter
  – Fewer **very** hot days; more humidity
  – More storms, delaying events

• Higher yields, poorer quality

• **2010** - **Warm nights at silking; wet fields; humidity**
Average Min Temperature (°F): Departure from Mean June 8, 2010 to September 5, 2010
Flooded Corn

- Generally a health hazard – flood waters are not clean.
- Cob soaks up; gets moldy and soft.
- Spreads mold to ear; likely A. Flavus.
- Threat of toxins; need to test!
- A mess after shelling- need to clean.
- Destroy or cattle feed if not toxic.
- Not in elevators or handling systems!
2010 Forecast

- Heat unit accumulation normal to above
- Warm, humid nights – consumed energy. Early maturity.
- N Loss from rain.
- Humidity – increased diseases, weak stalks
- Corn: Lower kernel weight; numbers set earlier. Means only average TW.

Watch TW AND TW Increase

- Soybeans: Small and large seeds (SDS)
SDS Soybeans

Small seeds, maybe chips
Correlated with SCN
Inbound Grading

Moisture
- 0.1% Moisture = 1-3 cents/bu
- +/- 0.3% vs GIPSA
- More than just once a year
- Calibration update

Test Weight
- +/- 0.5 lb/bu vs GIPSA
- 1 lb/bu = 1.5% inventory error
- Cup? Training or worse than meter!
Inbound Grading - Corn Damage

Inbound Corn Damage

Official Damage (%)

House - Official
Sample Handling

• Factors to be mechanically divided
  – FM or any other particle size based factor
  – Stones, toxins, GM or any count factor

• Factors less prone to division error
  – Moisture
  – Protein, other composition factors

• Factors not fully graded on every load?
  – Keep a half day composite; grade and adjust inventory records of target bins
Blending Ratios for Percentage Factors

Target = 4.5% Damage
So you want to use a Default?

- 1,000,000 bu of No. 2; 100,000 bu of high damage (10%)
- Defaults – 3.1% DKT
  - Will take 1.4 million to get rid of 100,000
- Actual – 2.0% DKT
  - Will take 333,000 to get rid of 100,000

Federal Houses do not have to use defaults any more to create No. 2 receipts

Grade a daily composite by bin; dryer = a bin.
Storage Management 2010

• What grain goes to piles and flats?
  – Clean, fill quickly.
  – Uniform moisture; means has been aerated
  – Higher test weight; as possible (56+ for corn)
  – From one crop year ONLY!!!
  – No history of problems; under your control for as long as possible.

OR a sacrifice!

Damaged corn will “burn out” and get more stable.
Aeration Phases

• **Phase 1: Fall Cool Down!!!!!!!!!!!!**
  • Lower grain temperatures stepwise
    • September 50-55 F (ASAP!)
    • October 40-45 F
    • November 35-40 F
    • December 28-35 F

• **Phase 2: Winter Maintenance**
  • Maintain temperatures with intermittent aeration
    • January, February 28-35 F (or less)

• **Phase 3: Spring Holding**
  – Keep cold grain cold
  • Seal fans, Ventilate headspace intermittently

Source: Purdue Univ.
Shrink – Handling and Storage

• Lost kernels, dust, mold, increased FM

• Some Estimates:
  – 0.5% (0.005) weight loss per in and out. Out to Pile counts double. More if multiple turns.
  – 0.2% FM Increase per rotation (15% corn); 0.4% if 13%, etc. More with dryer stress cracks or low TW.

  Double these for a low TW crop
  – 0.5% weight loss per 3% pt damage increase.

• Example: 3% to 12% is 9% pts = 1.5% shrink
Corn Use

Source: USDA

Billion bushels

- Feed
- Ethanol
- Other
- Exports

Source: USDA
Summary

• 2009 crop continues to deteriorate.
• It will take a long time to clear out all the off grade inventories. Expect close grading.
• 2010 corn crop quality will be better, but not great. 54-55 lb/bu; likely dry. Watch stalk health for lodging. Don’t mix years!
• Soybeans mixture of sizes; hard to process.
Where To Find Us...

Iowa Grain Quality Initiative
Grain Quality Laboratory

www.iowagrain.org
www.grainlab.org

Supporting Services and Technologies for BioProcess Industries

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