

Grain storage and management in a difficult harvest

IGQI Advisory Committee

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Iowa Corn Crop Summary: Quantity and Quality

- Quantity above trendline
- Quality
 - Wet: $>20\%M$, some much greater
 - Light: Test Weight ~ 52 lb/bu, no increase
 - Low protein: $<7.5\%$ ($15\%M$)
 - Storage time: $\sim 2/3$ normal, maybe less
 - Damage: $\sim 3-5\%$, normal = $1-2\%$

Iowa Soybean Crop Summary: Quantity and Quality

- Quantity above trendline
- Quality
 - Wet: >14% M, some much greater (20%)
 - Somewhat low protein: <35% (13%M)
 - Storage time: ~2/3 normal, maybe less

Weather Events and Quality

- West of I35: Reasonable planting dates
- East of I35: Progressively later
- 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%)

And now everything is frozen ...?

Soybean Drying Anyone?



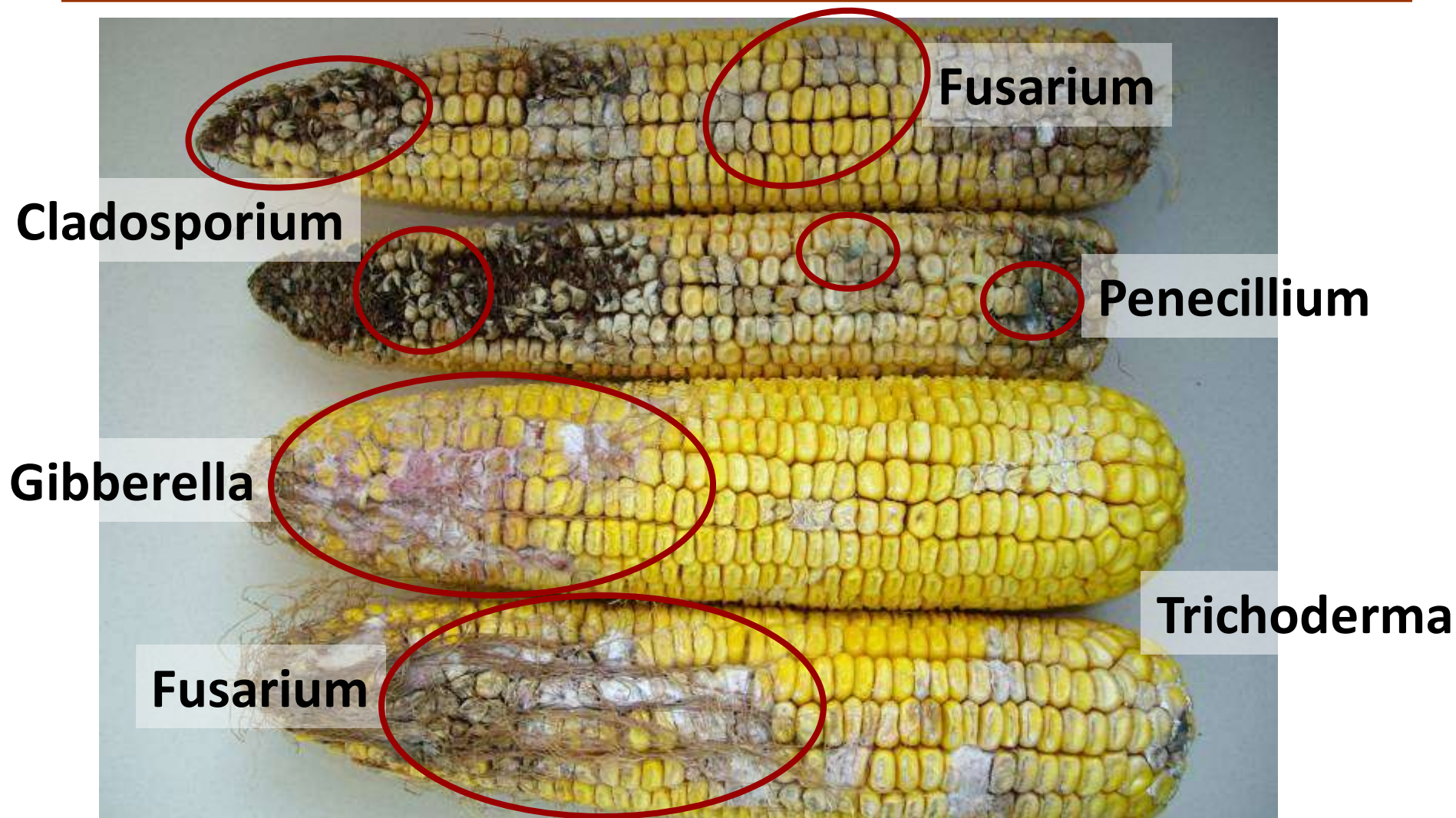


Hail damage, Sac County, 8-09-2009



Photos courtesy: Mark Licht, ISU Extension

Ear rot assessments – percent severity; rot present

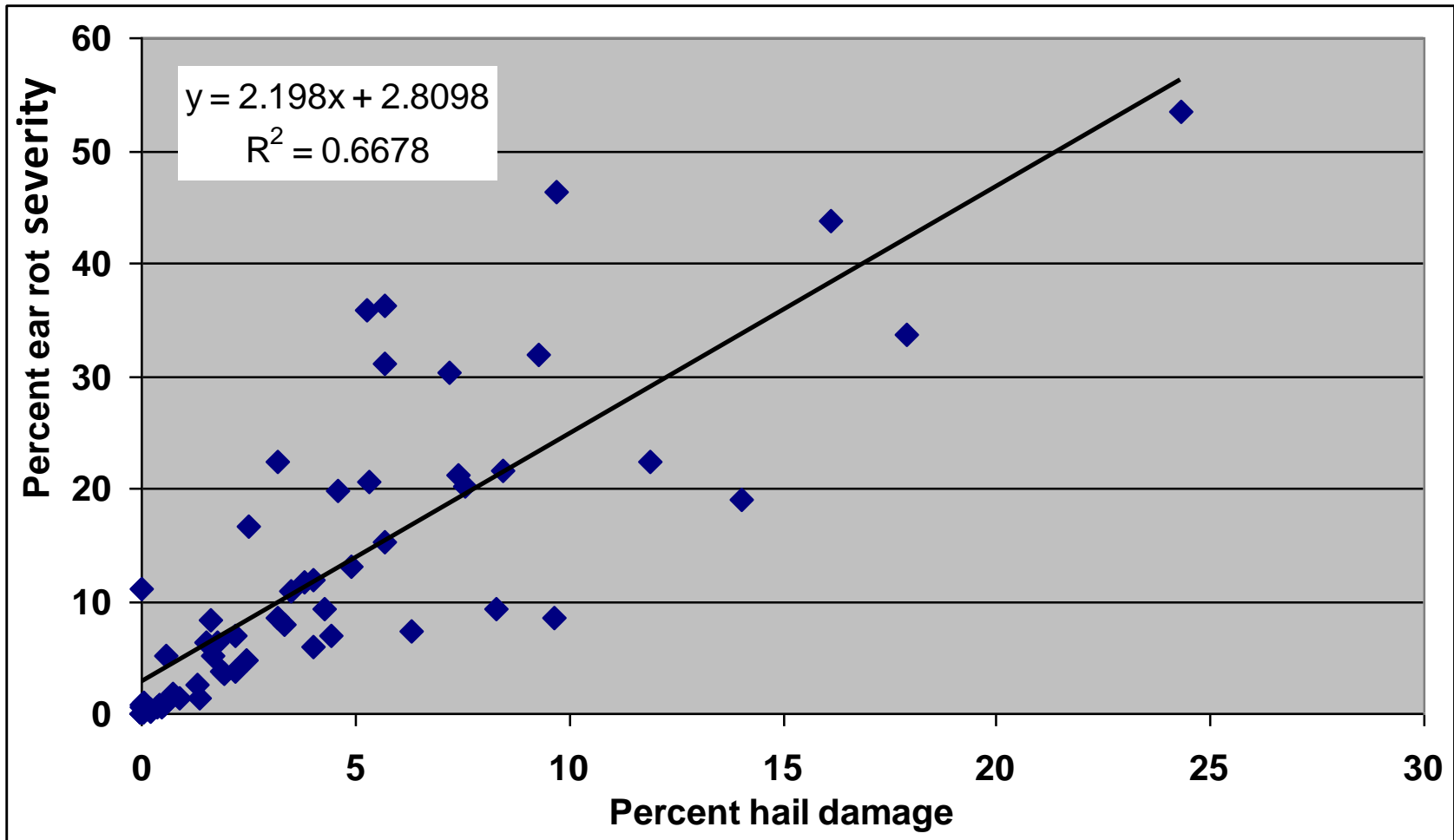


Ear Rot Summary

	Mean	High	Low	Ear rot*
<i>Hail samples (N=63)</i>				
Ear rot severity (%)	11.3	53.4	0.0	Fusarium, Gibberella
<i>Background samples (N=26)</i>				
Ear rot severity (%)	3.2	16.4	0.0	Cladosporium

* Predominant ear rots present

Ear rot severity (%) increased with greater hail damage (%)



Hail damage at Milk Stage increases ear rot

	Estimate	Standard error	P
R1 (silking)	0.10	0.83	0.91
R2 (blister)	-0.56	0.83	0.51
R3 (milk)	1.46	0.66	0.03
R4 (dough)	0.91	1.00	0.37
VT tasseling)	0		

Actions Now

- Do you know the moisture, test weight and temperature in every bin?
- Corn >20% M? Move or dry in January.
- Market by test weight.
- Expect 2/3 or less storage life.
- In Feb – remove some, check, relevel.
- Increase in temperature? Act now.
- Feed on farm? Test your corn; toxins, protein

Typical Ethanol Corn Specs

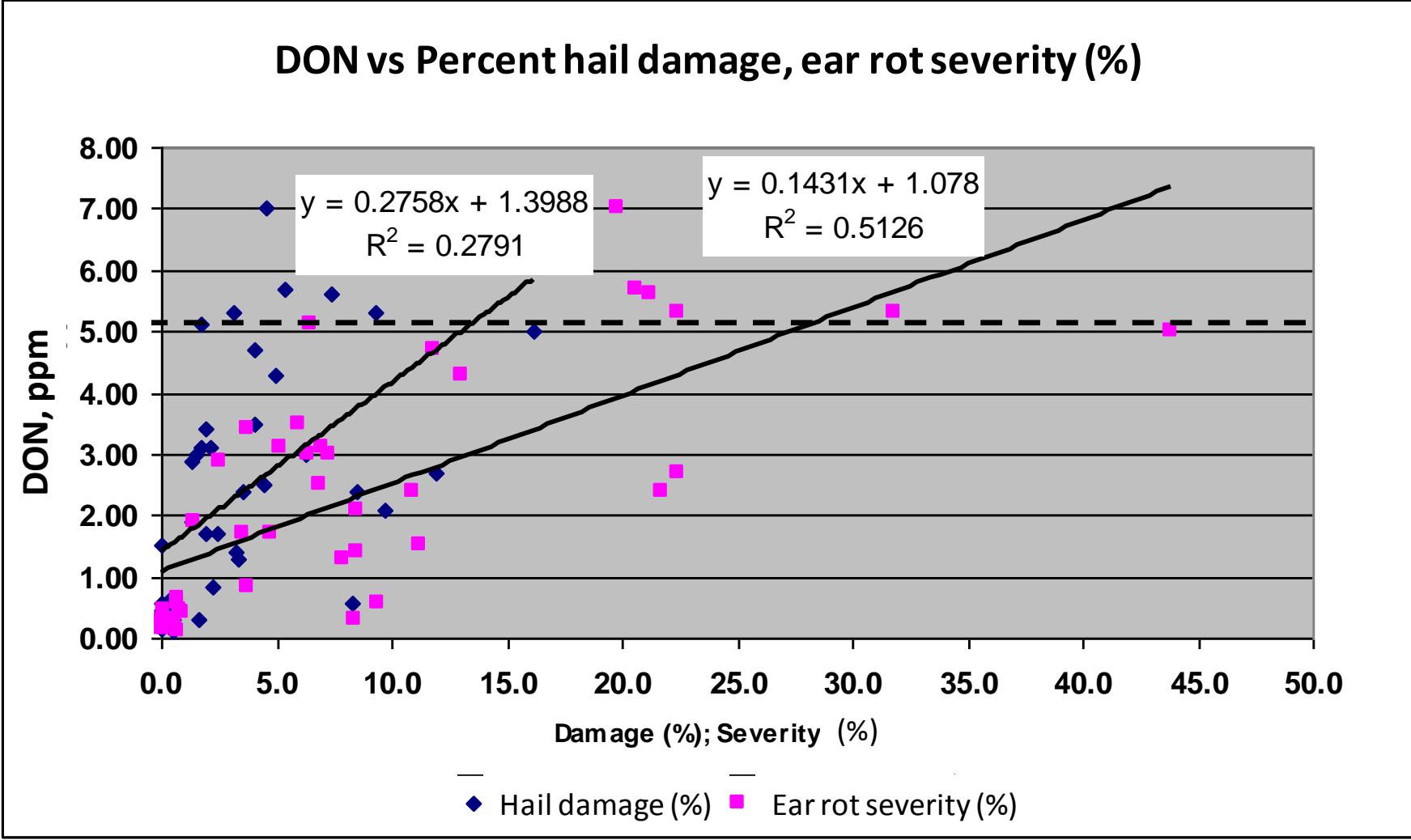
- **Base US Grade #2 Yellow Corn**
- Moisture limit: **17%** (a few take **18%**)
- Test Weight low limit: **54 lb/bu**
- Damage limit: **10%** max (discount from **5%**)
- Broken Corn: **12%** max
- Toxins: **<1/3 FDA guidance/action level**

Source: Hardy et al 2006.

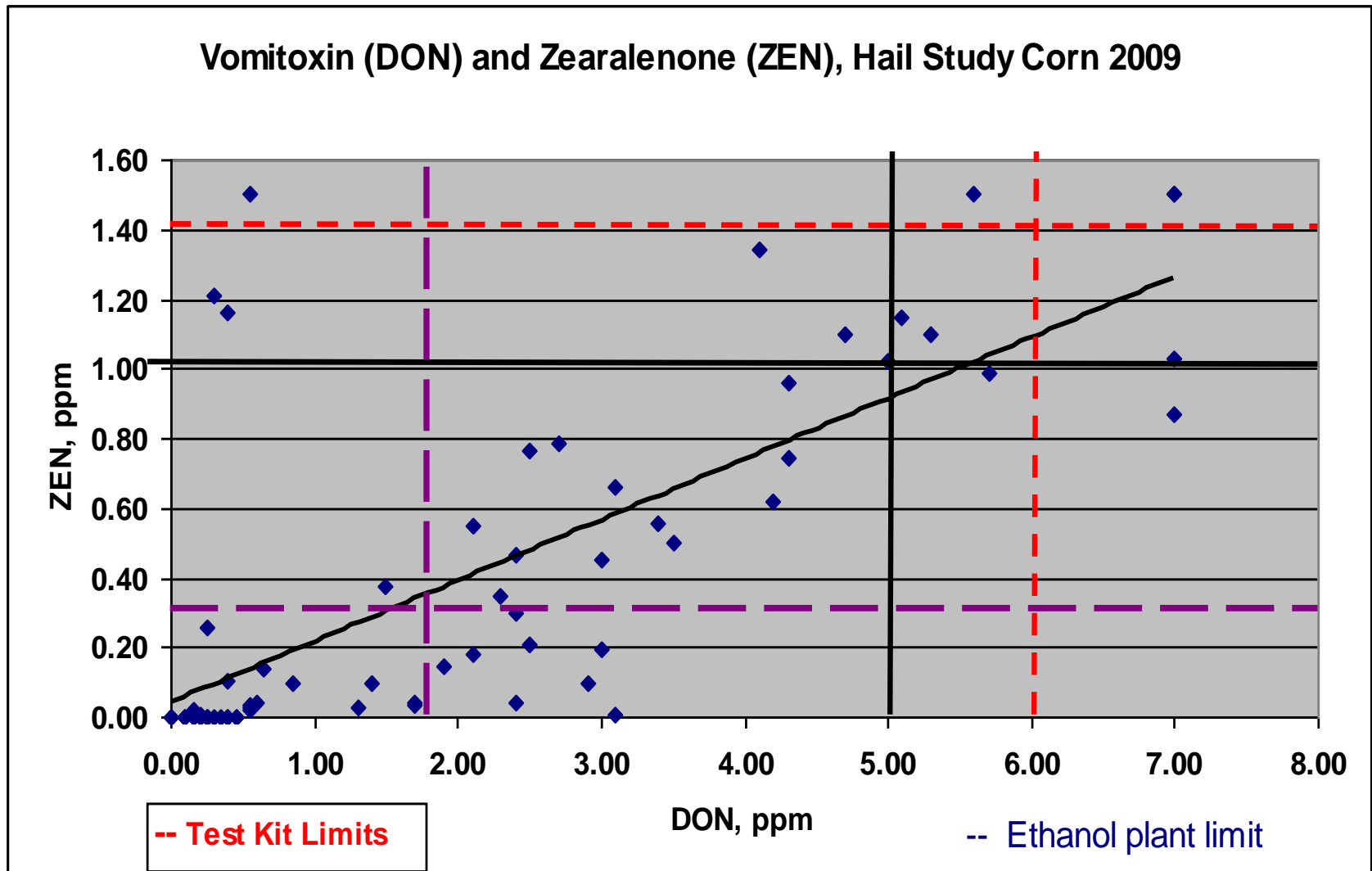
Mycotoxin Summary- Hail Study

	Hail	Total No. samples	No. positive	Mean	High	Low
DON	Yes	55	54	1.71	>6.0	ND
(ppm)	No	5	3	0.67	2.4	ND
ZEN	Yes	55	43	0.31	>1.4	ND
(ppm)	No	5	2	0.02	0.04	ND
Fum	Yes	55	40	0.25	4.8	ND
(ppm)	No	5	3	0.05	0.1	ND

Visual count and severity - best indicators

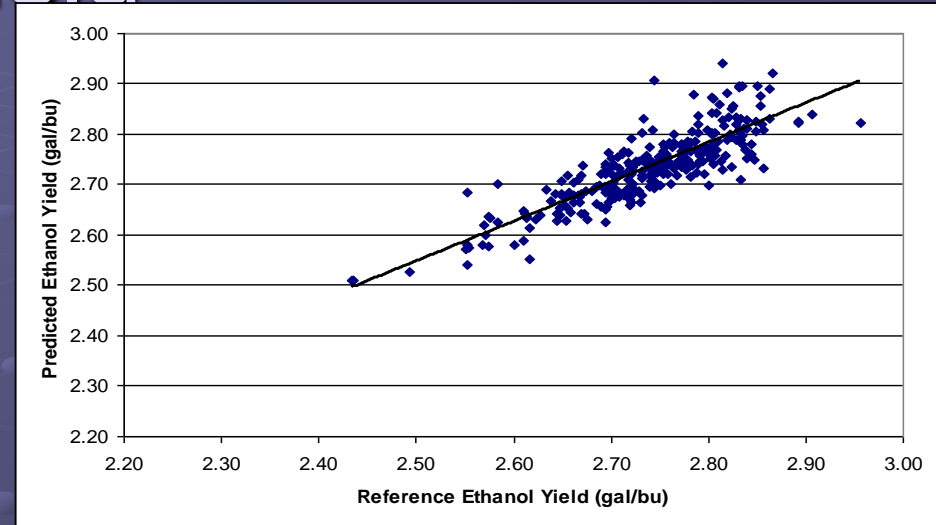


DON and ZEN present in hail samples



NIRS-Based Equation for Ethanol Yield

- 0.1 gal/bu =
\$6,000,000/yr
(100 mgy plant)

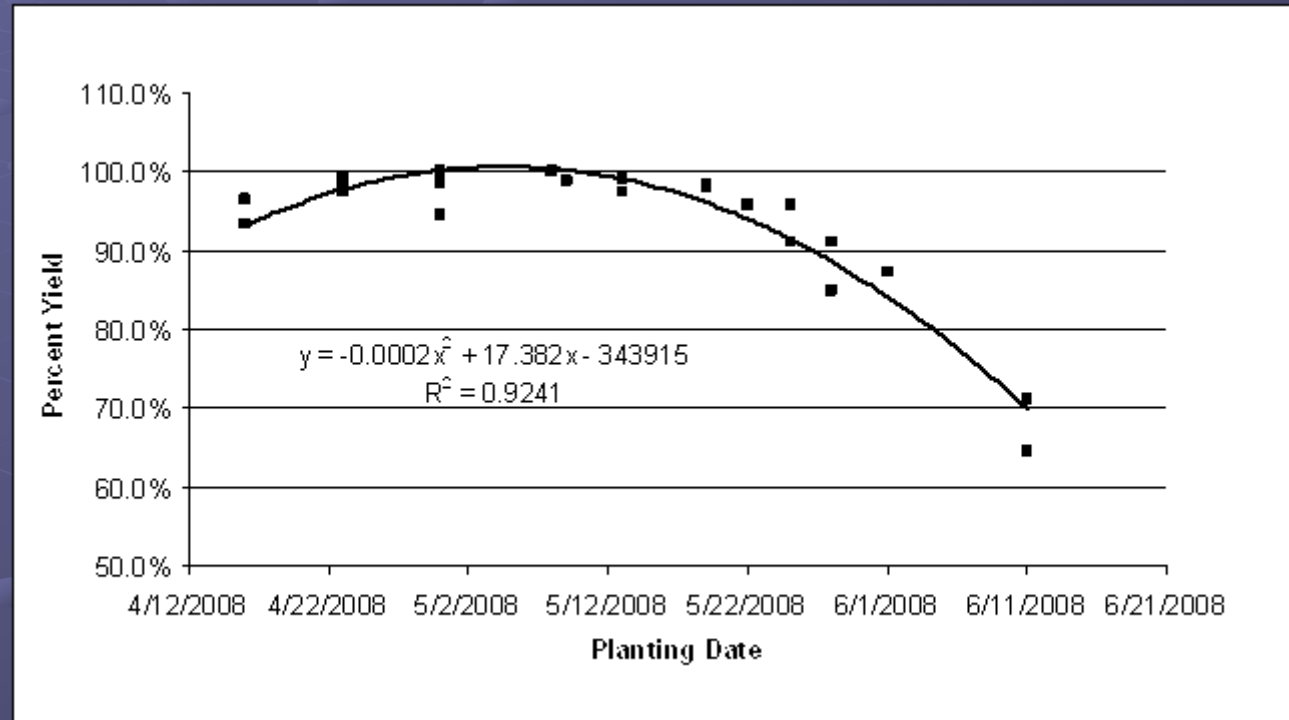


Predicted ethanol yield against reference ethanol yield
for final Protein-Oil-Density equation

Component	Final Equation Coefficients
B0	3.23
Protein	-0.062
Oil	-0.030
Density	0.104

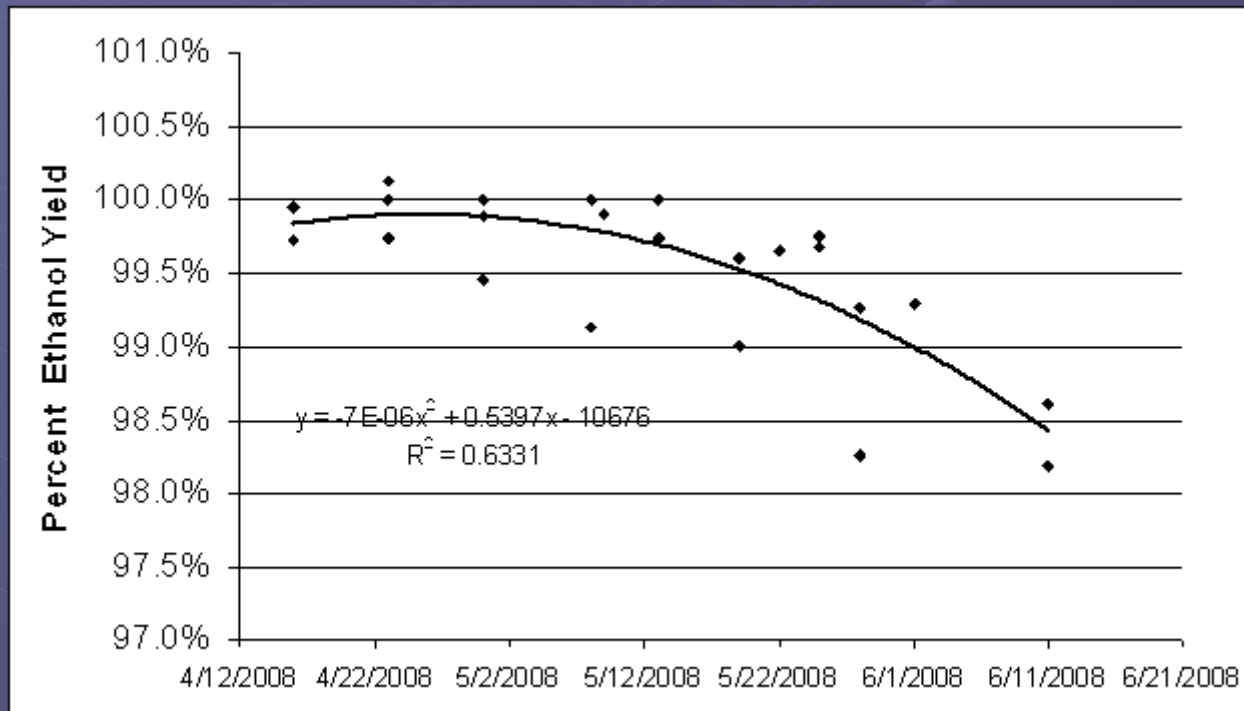
Planting Date - Grain Yield

- Converted to percent of maximum yield
- Normalized for location differences



Compiled percent maximum grain yield vs. planting date for 3 northern Iowa locations

Planting Date – Ethanol Yield



Percent maximum ethanol yield vs. planting date for 3 Northern Iowa locations - 2008

Economic Loss

● \$0.05 loss per bushel

● 100 million gallon per year ethanol plant

- 2.8 gal/bu
- 35,714,286 bushels/year
- \$1.79 million loss in ethanol production due to corn quality
- Plus cost to acquire additional grain
- **Note: \$2.77 million 12/2009**

Economic Loss Due to Corn Quality Compiled Northern Iowa Locations

Planting Date	\$/bu loss of ethanol
1	0.00
2	0.01
3	0.01
4	0.02
5	0.05

Ethanol Price March 2009 = \$1.42/gal

Iowa State University Extension model 'Ethanol Profitability', 2009

Integrated **Crop Management**



NEWS

**A Tough Harvest - Frequently Asked Questions,
Update (11/20/2009)**

**A Tough Harvest - Frequently Asked Questions
(11/1/2009)**

Soybean Quality Issues in 2009 (10/19/2009)

2009 Corn Quality Issues (10/15/2009)

**2009 Corn Quality Issues – Storage Management
(10/15/2009)**

2009 Corn Quality Issues – Field Molds (10/15/2009)

**Quality Issues Related to Hail Damaged Crops
(9/10/2009)**

<http://www.extension.iastate.edu/CropNews/2009/Issues/>



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