

Region 2 Referee

Virtual Corn

Seedling Evaluation Referee

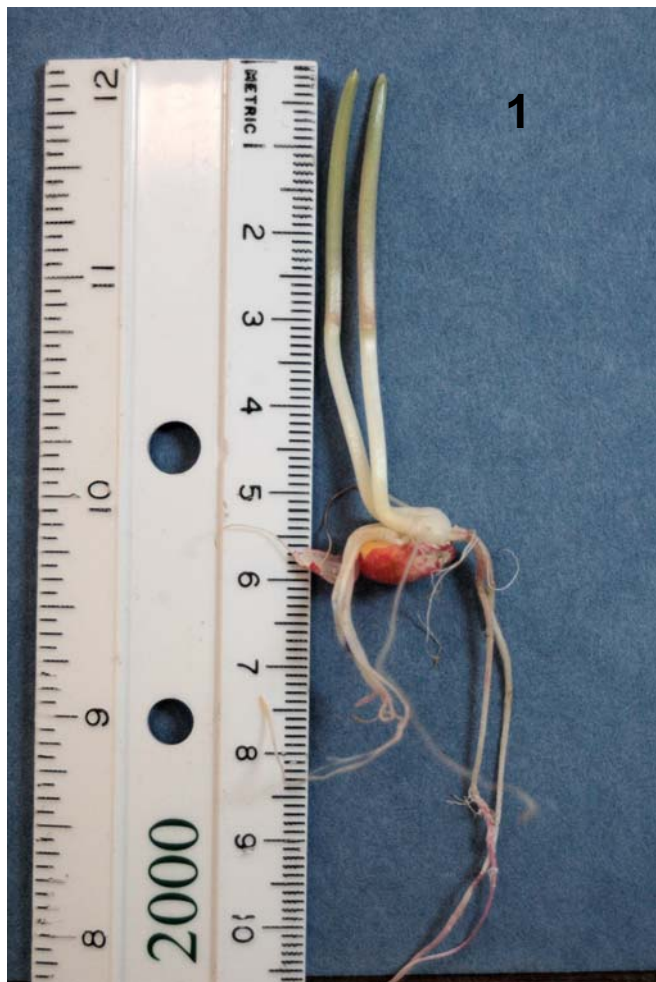
2008

Referee Basics

- Total of 148 participants
- 68 (46%) from one company with multiple locations (some overseas)
- 22 images, 1 drawing
- Years of experience*

15 or more:	38.8%
10-14 years:	16.3%
5-9 years:	16.3%
1-4 years:	14.3%
< 1 year:	14.3%

* Subset of non-company participants (61%)



Multiple shoots from one seed

ISTA:

Multiple fused shoots -
abnormal.

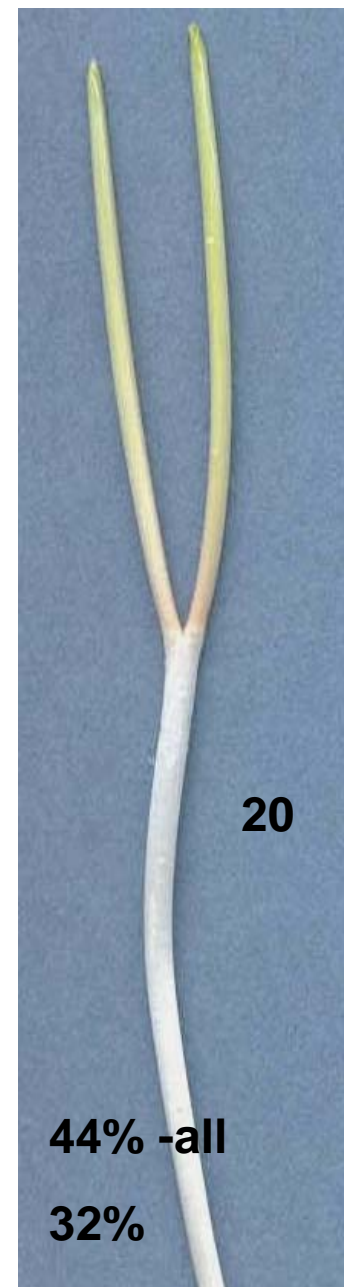
Separate shoots - normal.

AOSA: not in Rules

89% - all participants

84% - company participants

↖ **% calling seedling normal**





Shoot Tips Caught in Pericarp

Seedling #2 has just the tip of the shoot caught.

Comments:

- Coleoptile damage, deformity
- Shoot damage (ISTA: tip damaged?)
- Mesocotyl damage, deformity
- Leaf split (deformed), protruding from coleoptile
- Root damage, decay, insufficient

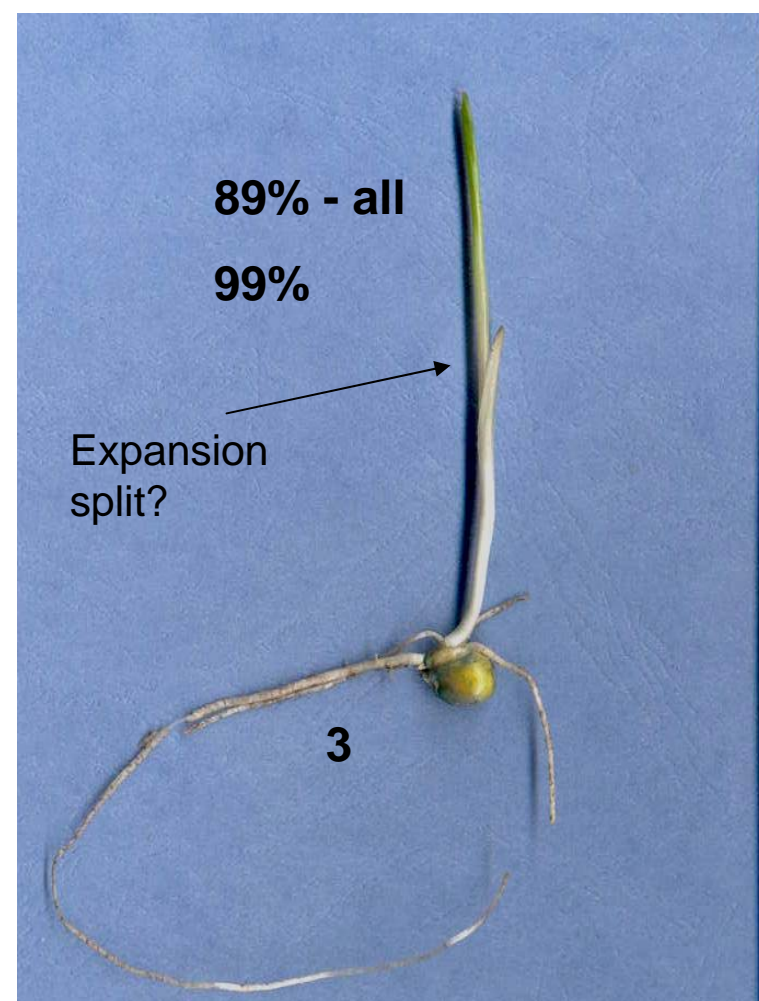
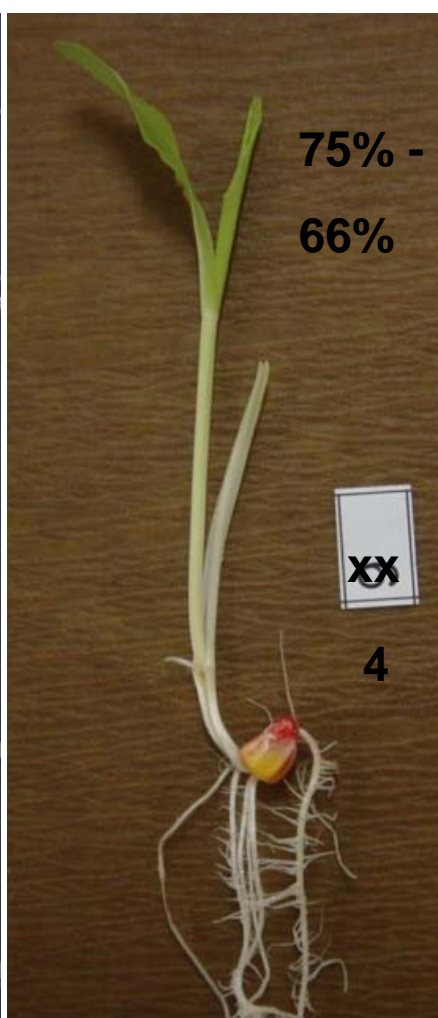


Shoot Tips Caught in Pericarp

Seedlings #18 and #22 have shoot tips caught, but also much less shoot development.

Seedling # 18: ISTA: Normal if shoot is greater than 1 cm

Seedling # 22: ISTA: Abnormal coleoptile

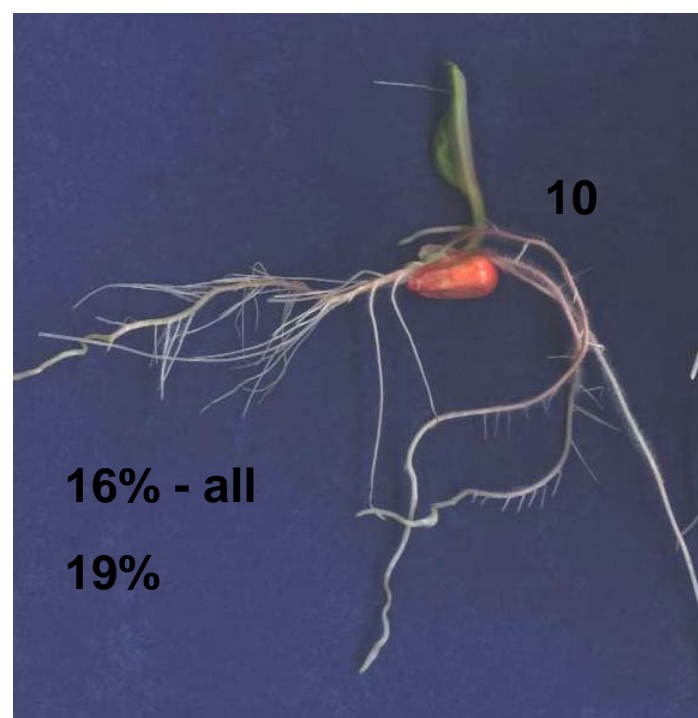


Coleoptile Damage: Leaves look to be undamaged. Seedling # 8 is probably genetically-related. Seedlings # 8 & # 4 would have been abnormal according to ISTA before harmonization.

Seedling # 3?

ISTA Lab: # 8 – short roots (abnormal)

#4 – abnormal

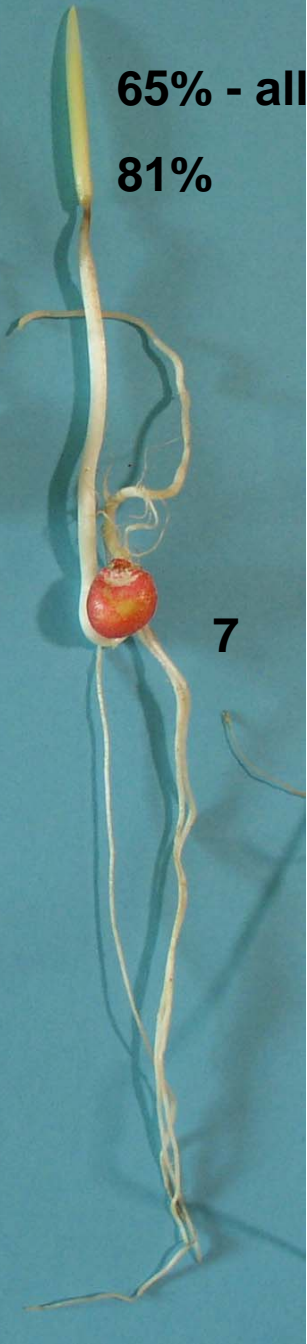


Protruding Leaves

- Seedlings abnormal by ISTA and AOSA Rules.
- Normal by AOSA before harmonization (?)

65% - all

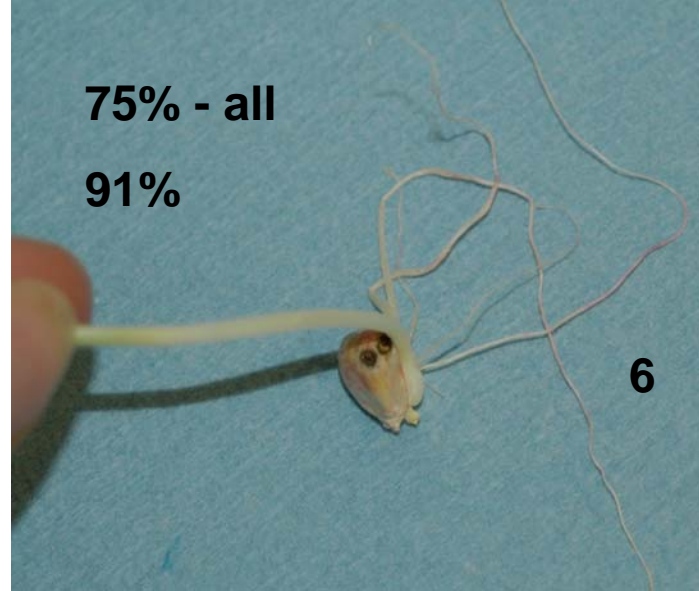
81%



Seedling # 6
Insect Damage

75% - all

91%



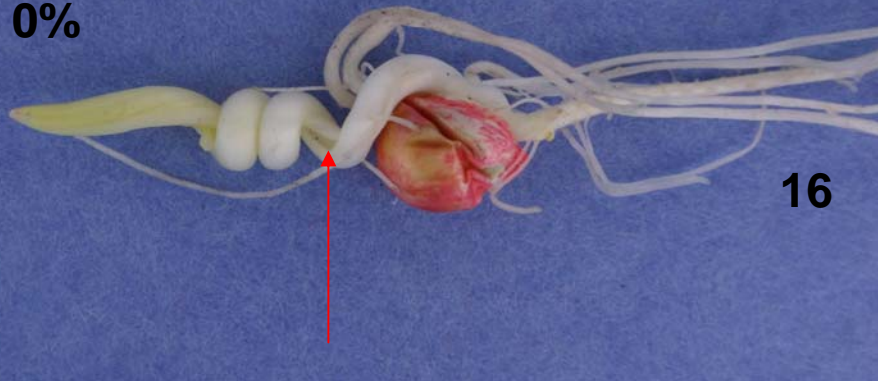
Seedling # 7 Secondary Infection?

Comments:

- Coleoptile damage (38%)
- Decay (38%)
- Shoot damage
- Leaf decay, not emerged
- Weak seedling
- ISTA Lab: secondary infection (normal)

34% - all

0%

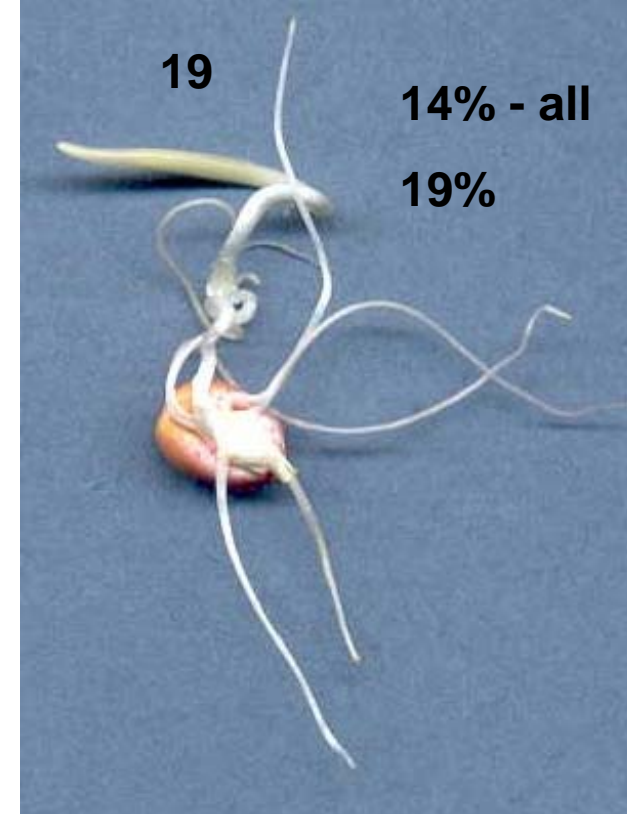


Seedling # 16: Twisted with lesion on inside of curl.

19

14% - all

19%



Seedling # 19: Mesocotyl Damage

- Severe shredding of mesocotyl
- Damaged coleoptile (?)

11

57% - all

94%

Seedling # 15

9% - all

2% - company

3% undecided

Frost Damage

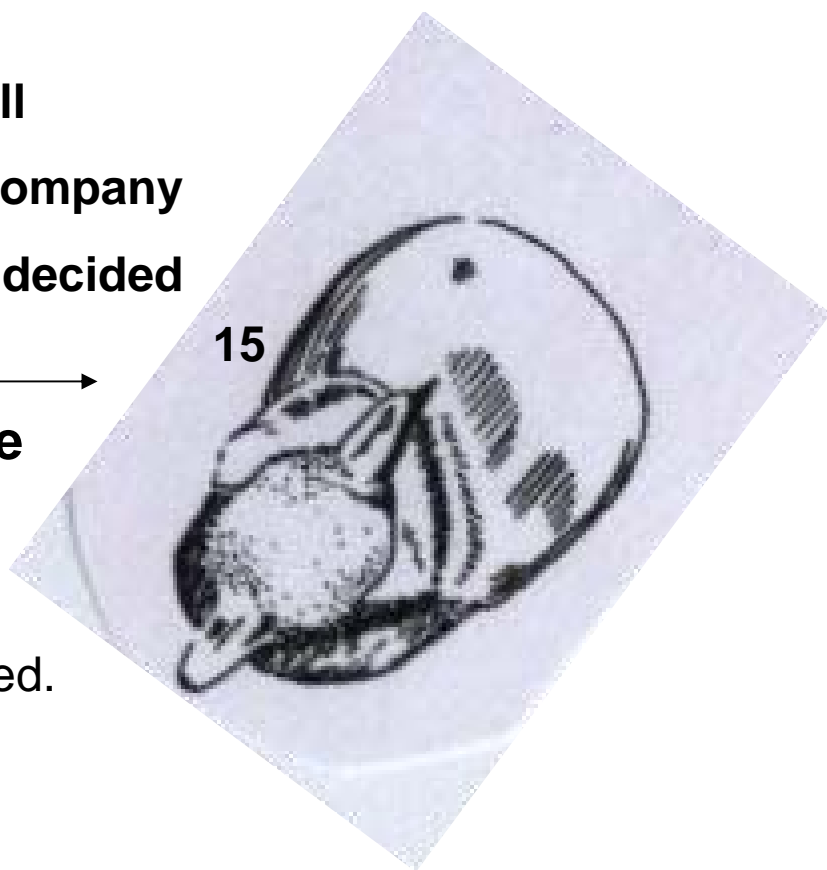
- Looks similar to non-tolerance to glufosinate?
- Actually is frost damaged.
- Too weak

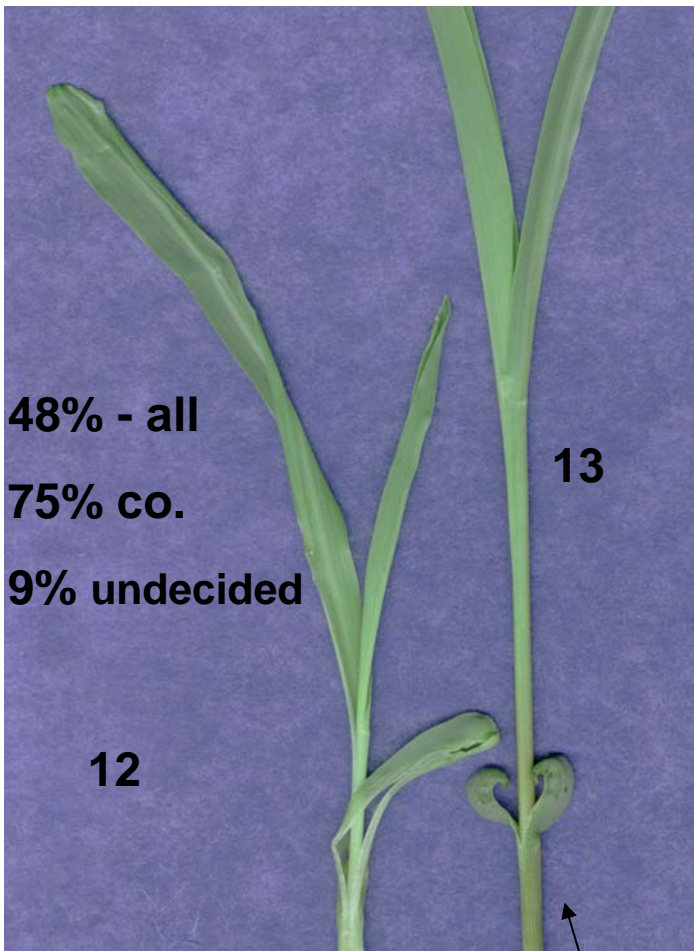
Seedling # 11: ???????

Comments:

- Insufficient primary root (94%)
- Weak Seedling (6%)

15





48% - all

75% co.

9% undecided

12

13

70% - all

98% - company

10% undecided

2006: 27% normal (seedling # 12)

42% normal (seedling # 13)

2007: 20.8 (45.0) (seedling #12)

49.6 (51.7) (seedling # 13)

- Three leaves are showing.
- First leaf of each seedling is damaged. Other two leaves are undamaged.
- Do analysts think that seedling # 13's first leaf isn't a leaf?

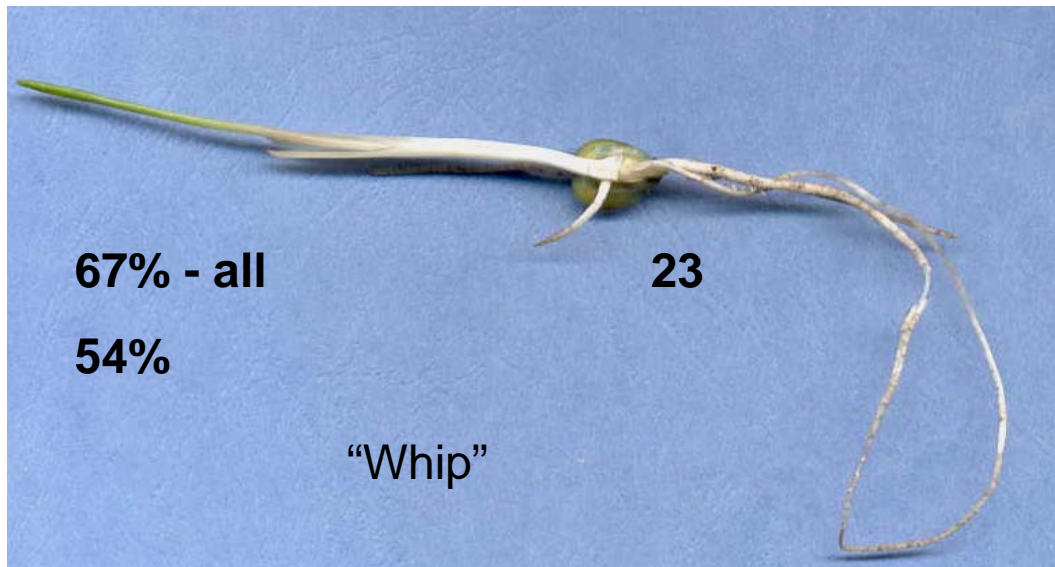


Seedling # 17

Badly split leaf. Great roots

Seedling # 21

Shredded leaves and coleoptile.



67% - all

54%

“Whip”

23

Seedling # 23: Sealed 1st Leaf

Comments:

- Split deformed, trapped in coleoptile
- Roots insufficient. Decayed, weak.
- Leaf not emerged

Seedling # 9: Short Shoot

- Late starting seedling?
- Why is shoot small?
- ISTA Lab: normal if shoot greater than 1 cm.



14% - all

9

10%

Survey

- Substrate used for corn?
- If towels, what size? Number of seeds/towel?
- When are germ tests done (# of days)?
- Do you extend slow samples? How many days?
- Familiar with corn section of SEH?
- Familiar with corn section of ISTA Handbook of Seedling Evaluation?
- Changes in word description you would like to see?
- Changes in drawings?
- Are you in favor of adding photos to SEH?
- How much experience do you have evaluating corn?
- Are you are certified in germination?
- Does your lab conduct ISTA germs? On what substrate?

Where do we go from here?

- Finish compiling information.
- Submit changes to Seedling Evaluation Handbook – “stay” harmonized with ISTA.
- Are we really harmonized (multiple seedlings from one seed, crepe cellulose paper).
- Only one set of drawings is in both sets of Rules.
- Do abnormalities reflect real-life?

THANKS TO:

- Pioneer
- Monsanto
- AgReliant. Great Lakes Hybrids
- BioDiagnostics Inc.
- SGS – MidWest Seed Services
- Syngenta
- Iowa State University
- All who contributed and/or participated !!