Aflatoxin Workshop – April 19, 2006
Bettendorf, Iowa
Summary and Recommendations

Presentation Highlights:

- Dr. Charles Hurburgh: Iowa Grain Quality Initiative, Iowa State University Chairperson

- Dr. Alison Robertson: Iowa State University – Plant Pathology
  - Presented – aflatoxin growth and identity
    - Black light gives numerous false positives
    - Aflatoxin production occurs at 17% moisture and 55°F to 25% moisture and 104°F

- Dave Bell: USDA – RMA
  - Presented – sampling and crop insurance
    - Aflatoxin coverage – based upon an approved testing laboratory
    - FDA advisory levels 21-300 ppb – claim settlements
    - FDA advisory level over 300 ppb – grain must be destroyed
    - Insurance ends at harvest, no coverage after
    - Insuance principle not to have the insured involved in the settlement (i.e. farmer cannot take the sample)

- Garnett Wood, Ph.D. – FDA – Center for Food Safety and Applied Nutrition
  - Presented – aflatoxin regulatory issues
    - Aflatoxin B_1 is most toxic and present in greatest amount
    - FDA regulatory levels (action levels) are supported by science-based risk assessments
    - Countries with no aflatoxin contamination problems have lower regulatory levels
    - FDA compliance programs directed at commodities in inter-state commerce
    - Food Compliance programs monitored by Center for Food Safety and Applied Nutrition
    - Feed Compliance programs monitored by Center for Veterinary Medicine

- Terry Jensen – IDALS – Feed and Fertilizer Bureau
  - Presented – Iowa feed position on aflatoxin
    - Letter from IDALS to FDA requested increased aflatoxin blending ability
    - CMV letter on blend policy

- Ned Bergman – USDA – CCC
  - Presented – management practices in local markets
    - Requirements are to preserve quality of grain
    - Aflatoxin testing is a voluntary program

- Richard Wahl – IDALS – Grain Warehouse
  - Presented – Iowa warehouse position on local markets
    - Follow FDA guidelines for intended end use
    - Improper use will be reported to Feed Bureau
    - Not responsible for routine sampling
    - Do not require warehouse operators to accept contaminated grain
    - Bureau is not responsible for disposal issues

- Robert Lijewski – USDA – GIPSA
  - Presented – role in aflatoxin testing
    - Provide rapid accurate aflatoxin testing services
    - Cedar Rapids tests – 15,000 samples per year
    - In 2005 – 4.5 percent tested positive to aflatoxin
    - Reports any lot that was Officially sampled with 20 ppb and higher to FDA

- Joe Aull – Grain Processing Crop.
  - Presented – aflatoxin in corn processing
    - Sampled every load with black light and ViCam quantitative test
    - Test range to accept a load of corn was 0 to 19 ppb aflatoxin
    - The initial period showed a rejected rate of 12 to 14 percent of loads for 2005 crop
    - After the first month that rate declined, with a rejection rate of 6 – 8% for some time
    - The rejection rate has leveled off at 3 – 4% for the past months
    - The belief is that the rejection rate will increase until bins are cleared of the 2005 harvest
    - Non GMO grain had higher levels of aflatoxin and higher rejection rate

- Virgil Schmitt and Jim Jensen – Iowa State University – Area Extension
  - Presented – Early warning needs
    - Communication was not broad enough and early enough
    - An early warning system would help in developing the right communication
    - Insurance requirements were not developed early in the event; were unevenly applied.

Discussion Points

1. Need to be able to identify potential aflatoxin fields earlier and more quickly.
2. Inconsistency in field sampling caused varied levels of aflatoxin readings.
3. Inconsistency in sample size/sample handling caused varied levels of aflatoxin readings.
4. Inconsistency in sample treatment caused varied levels of aflatoxin readings.
5. Aflatoxin levels in fields are determined by fall weather - hot and dry as corn is drying down.
6. Aflatoxin levels in the field are caused when corn is not mature in hot dry conditions.
7. Insect damage will aggravate the problem.
8. Weather patterns in 1983, 1988 and 2005 caused aflatoxin levels to be significant.
9. An aflatoxin development model for northern corn belt would improve predictability.
10. Insurance loss adjuster was not always able to take a timely sample at harvest.
11. Aflatoxin increases rapidly in a short time if conditions are right so:
12. Insurance field samples taken from a field strip left after harvest may not be representative of the harvest taken earlier or:
13. Insurance samples taken before harvest may not always identify aflatoxin levels at harvest a few days later but aflatoxin then can be identified at the elevator with no risk settlement.
14. Number of samples per field required for accurate risk assessment is not well known.
15. RMA paid $6,000,000 in aflatoxin settlements in 2005.
16. Some farmers may have received undeserved payments and some may not have received payments to which they were entitled because of sampling error.
17. Farm fields identified by insurance with significant aflatoxin are not communicated to grain handlers, state agencies or the FDA.
18. Some grain was taken to the elevator which had known levels of aflatoxin without warning to the buyer.

19. Not all aflatoxin corn went to the required market source defined by FDA guidelines.
20. Corn which had stacked insect traits showed less susceptibility to significant aflatoxin levels.
21. Processors were required for internal customer and liability reasons to test every corn load
22. Producers felt cornered with few market options once aflatoxin was determined.

Recommendations

1. **Develop a northern corn belt model for aflatoxin occurrence.**
    a. Does soil type affect levels of aflatoxin across fields?
    b. Does corn hybrid or physical traits affect kernel susceptibility to aflatoxin?
    c. What are the precise weather temperature variables causing aflatoxin and can a forecasting model be created?

2. **Evaluate the field sample requirements which end at harvest for a risk payment.**
    a. Sample taken at harvest, what does that mean?
    b. Do samples taken at harvest have the same level of aflatoxin as a sample taken at harvest from a strip left for risk assessment?
    c. Do sample locations in a field determine differential levels of aflatoxin; what would be the best sampling plan to reduce the variability of settlements?
    d. Can the typical 25-40% error level be reduced by consistency in sample taken, sample size, sample coarseness or other factors, number of samples, etc?

3. **Training for insurance loss adjusters responsible for risk assessment for RMA payment for aflatoxin laden corn**
    a. How does a corn plant develop
    b. How does aflatoxin develop and under what conditions
    c. Field sampling procedures and parameters of sampling error
    d. AIPS procedures for reinsured for uniform payout

4. **Investigate a sample procedure with GPS parameters**
    a. A sample taken at harvest that is GPS defined
    b. A sample taken at harvest at each unload and marked on the GPS map
    c. A sample bag defined for each unload dump at harvest matching the GPS location
    d. GPS procedures validated by loss adjusters at harvest enhance documentation of sample

5. **Improve communication through early warning tools**
    a. A model with predictable parameters on a web site
    b. A web site with risk assessment tool such as a model, drought maps, corn variety factors, and other features defining risk
    c. Can field scouting practices be incorporated into early warning strategies?
    d. Can extension and other agencies work together to distribute information on risk and levels of risk of aflatoxin development for a given crop year.

6. **Improve record keeping and market listing for corn with varying aflatoxin levels**
    a. Develop a listing mechanism whereby information on corn tested and aflatoxin levels is available for elevators and processors to make business risk assessments.

b. Develop a market list where aflatoxin corn may be disposed of according to FDA guidelines.

7. **Crop insurance coverage on stored corn for the Northern Corn Belt – producer recommendations**
    a. Allow storage coverage for that crop's marketing year
    b. Improve overall sampling error
    c. Provide improved coverage for producers
    d. Reduce RMA costs of implementation and payouts
    e. Policy needs to improve safety in the food chain

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