“PLANT HEALTH” APPLICATION OF FUNGICIDES IN SOYBEANS: A Paradox to the IPM Paradigm?

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SITUATION

- Prior to 2003 fungicides were rarely used in soybean except in AR, MS, and TN on at most 250,000 acres.
- In 2005, fungicides were applied to an estimated 7 million acres (almost 10% of the U.S. Soybean acres).
Background

- “Plant Health”
  - Strobilurin fungicide
  - Target: R3-R5 soybean
  - Application regardless of pest history or documented pest potential.

- In 2003-04: Quadris + Warrior marketed for reproductive soybean as a means of capturing additional yield”.
  - Based on favorable grower strip trial results in 2002.
  - 2003 Yield “guarantee program” encouraged use.

- Headline (pyraclostrobin) was labeled in early 2005; Plant Health™; SBR Insurance.

- Use spread throughout the North Central region in 2005.
Strobilurin
Yield Effects in Soybean

- Yield response to strobilurin in replicated plots and non-replicated grower strip tests is highly variable.
  - Negative to 25+ bu/A
- KY results: Significant yield response to strobilurin application in 6/22 (27.3%) replicated studies, 2003-05.
- Midwest: 65 replicated studies conducted in 2005.
Yield Response in 35 Replicated Studies

summarized by Marty Draper, SDSU

Yield advantage (bu/A - deviation from control)

Trial Location

~28%

~40%

~28%

Numeric response – Relative advantage of treatment
Absence significant soybean disease in all trials
<table>
<thead>
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<th>Fungicide</th>
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<td>Headline</td>
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*Data summarized by Marty Draper, SDSU*
2005 Soybean yield response
Indiana and Ohio Soybeans: Headline application vs. Untreated

Distribution of data on farm trials in 2005. (IN and OH) n= 162

Histogram distribution of data points

Average increase = 5.6 bu/acre

Source = BASF
2005 Soybean yield response

**Southern Soybeans**: Headline application vs. Untreated

Histogram distribution of data points

*Average increase = 8.5 bu/acre*

Source: BASF

*Distribution of data on farm trials in 2005. (AR, KY, LA, MS, NC, SC, TN, TX) n=192*
Basis of Strobilurin “Plant Health” Effect in Midwest?

- Control of “background” levels of certain important fungal diseases and disease complexes.
- Control of unrecognized or non-symptomatic diseases.
- Direct impact of strobilurins on plant biochemistry reduces impact of stress in some soybean cultivars and environments.
2006 Fungicide Use in Soybean?

- Poised for a significant increase in the number acres sprayed in U.S.
  - Generally favorable data being made available to growers by fungicide manufacturers and others.
  - Use of “plant health” applications as soybean rust “insurance”.
  - Syngenta attempting to regain market share; BASF attempting to keep market share; other manufacturers desiring to gain market share.
Conclusions:

- Are “plant health” fungicide applications IPM?
  - NO......NOT NOW......MAYBE?

- Is there something going on with “plant health” sprays that we don’t understand?
  - YES

- Do we know which conditions/situations favor a “plant health” response:
  - NO....much more research is needed.
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- Do we know which conditions/situations favor a “plant health” response:
  - NO....much more research is needed.
- Should plant health sprays be deployed even they are not based on current IPM principles?
  - Let the discussion commence.