Overview

• What is IPM
• Fungicide and Insecticide resistance
• Review of On-Farm Network trials conducted from 2006 – 2016
• Expected ROI
• On-Farm Network 2018 Trial Opportunities
IPM

• Integrated Pest Management is a unique approach to manage agricultural pests.

• Proper IPM takes into consideration:

Multiple control strategies
Field scouting
Economics
Environment
Insecticide Resistance

• Soybean Aphid is the top soybean insect pest in Iowa

• Soybean Aphid populations showing resistance to pyrethroids

• Pyrethroid resistant aphids have been found in northern Iowa and southern Minnesota
Aphid Management

- Consider planting an aphid resistant variety (Rag 1,2,3,4)
- Scout R1-R5
- Economic threshold of 250 aphids per plant
- Re-evaluate insecticide application after 3 days
Fungicide Resistance

- Potential for fungicide resistance to develop.
- Strobilurin (QoI) are High Risk for resistance development.
- Fungicide is applied to relatively few acres nation wide.
Prevent Resistance!

• Fungicides are more effective as a preventative application

• Should I spray or not? Think about:
  • Seed disease package
  • Weather pattern
  • Disease history in the field
  • Scouting

• Ok, I need to spray
  • Use multiple modes of action
  • Rotate AI
On-Farm Network Fungicide and Insecticide Trials

• Fungicide products are often marketed to provide additional plant benefits aside from disease suppression

• Tank mixing an insecticide with a fungicide could save application costs

• Synergistic effect?

• Both chemical require precise application timing for best results
Trial Setup & Methodology
24 two treatment trials, 2006 - 2016
Fungicide & Insecticide vs. Untreated

25 three treatment trials, 2013 - 2016
Fungicide vs. Fungicide & Insecticide vs. Untreated
Soybean Yield Response, Bu/ac

Two Treatment Trials
Fungicide & Insecticide vs. Untreated

Trial ID

ST2016IA0258
ST2015IA202A
ST2014IA332A
ST2014IA309A
ST2014IA231A
ST2014IA068B
ST2012IA234A
ST2010299A
ST2009389B
ST2008299B
ST2008297B
ST2008298B
ST2008299B
ST2008217A
ST2006438b
ST2006416
ST2006409
ST2006334b
ST2006323b
ST2006309
ST2006308
ST2006306
ST2006305
ST2006250
ST2006106

Pooled Mean

Number of replications
Soybean Yield Response, bu/ac

Three Treatment Trials
Fungicide vs. Fungicide & Insecticide vs. Untreated
### Yield Average By Individual Treatment

<table>
<thead>
<tr>
<th>Treatment</th>
<th>WEST</th>
<th>EAST</th>
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<tbody>
<tr>
<td>Untreated</td>
<td>47.9</td>
<td>60.7</td>
</tr>
<tr>
<td>Priaxor + Fastac</td>
<td>60.7</td>
<td>64.2</td>
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<td>Priaxor</td>
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<td>47.5</td>
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<td>Priaxor + Fastac</td>
<td>64.2</td>
<td>55.8</td>
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<tr>
<td>Untreated</td>
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<td>Priaxor</td>
<td>60.9</td>
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<tr>
<td>Priaxor + Fastac</td>
<td>47.6</td>
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</tr>
<tr>
<td>Untreated</td>
<td>47.6</td>
<td>51.2</td>
</tr>
</tbody>
</table>

### Yield Average for All Individual Treatments (bu/acre)

- **Priaxor + Fastac**: 59.3
- **Priaxor**: 51.5
- **Untreated**: 45.3

### Disease Severity (%)

#### Septoria Brown Spot
- **Lower Canopy**
  - Experimental Unit Avg.
  - Treatment: Priaxor + Fastac, Priaxor, Untreated
  - Disease Severity (%)

#### Cercospora Leaf Blight
- **Upper Canopy**
  - Experimental Unit Avg.
  - Treatment: Priaxor + Fastac, Priaxor, Untreated
  - Disease Severity (%)

### Experimental Unit Number

- Treatment: Priaxor + Fastac, Priaxor, Untreated
- Disease Severity (%)
- Range: 1 to 9
Pooled Mean

Fungicide & Insecticide vs Untreated

Fungicide vs Untreated

Soybean Yield Response, bu/ac
<table>
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<th>Treatment Costs</th>
<th>$7.00</th>
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<td>3.2</td>
<td>2.9</td>
<td>2.7</td>
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</table>
Conclusion

• While different products were used in this study we could not find significant response between insecticides or fungicides across trials or years

• Does not appear to be any synergistic effect

• The majority of yield responses came from the fungicide application

• When insects are above threshold, insecticide ROI is very strong
2018 Trial Opportunities

- Plant Nutrition
  - Poly4 Polyhalite – K trial
  - Nitrogen mgmt. in cover crop
  - AgXplore BorPak
- Multi-Rate Nitrogen
- Yield Igniter
Poly4 Polyhalite vs Potash

- 14% K₂O, 17% CaO, 6% MgO and 19% S
- Low chloride fertilizer with improved nutrient uptake.
- Poly4 provided for trial
- Targeting potassium deficient fields.
- Applied Spring 2018
Nitrogen management in cover crop before corn

• Testing nitrogen form or timing
  • AMS vs 32%UAN
  • All N preplant vs Split application

• Targeting cover crop fields going to corn

• “Pop Up” nitrogen
AgXplore BorPak on Soybean

- Boron manages plant carbohydrate levels
- Essential during bloom and pod set
- Soybean foliar apply R1-R3

http://www.atpnutrition.ca
Multi-Rate Nitrogen

• 5 rate nitrogen trials – Year 2
  • 100, 130, 160, 190, 220 lbs N

• Testing Precision Planting’s Smart Firmer

• Year 1 results are covered in:
  • Adaptive N Management – Anthony Martin
  • Corn Research Trials – Rich Stessman
Yield Igniter

• In-season foliar nutrition for soybean

• 9-9-3 + humic acids

• Yield Igniter will be provided for the trial area.
2018 Trial Opportunities

- Crop Management
- Soy VRS basis trial
- Soy multi-genetic planting
- Tillage
  - Strip-till, No-till, Conventional till
- Cover Crop termination timing
Soybean VRS basis trial

• Plant replicated strips of:
  • 100, 130, & 160 K seed/ac

• Use data to characterize soybean VRS zones.

• Testing Precision Planting’s Smart Firmer
Soybean multi-genetic planting basis trial

• Split planter 2-4 soybean varieties

• Highlight the importance of soybean seed selection

• Use data to characterize soybean variety zones

• Determine value of multi variety planting in fields with iron chlorosis
Tillage - Strip-till, No-till, Conventional till

• Compare yield and other agronomic benefits between different tillage practices
Cover crop termination timing

• Termination timing of cover crops can greatly effect the performance of the cash crop

• Compare cover crop terminated 2 weeks pre-plant, at planting, and after planting
2018 Trial Opportunities

- Pest Management
- Nematicide seed treatment
- Layered residual herbicide
- Fungicide
Nematicide Seed Treatment

• SCN eggs were sampled in 98% of fields in 2017

• SCN is the #1 soybean pest.

• ~20 acres of seed provided for trials
Layered Residual Herbicide

- Trouble managing late season weeds

- Post residual herbicide can prevent late season weed emergence

- Outlook herbicide provided for post residual application.
2018 Trial Opportunities

- Biological & PGR
- TerraMax inoculant seed treatment
- Valent MycoApply EndoPrime
- Tryptophan concentrate
TerraMax inoculant seed treatment

• Characterize the level of enhanced nodulation for new inoculant

• Contains bradyrhizobium

• Seed will come pretreated with TerraMax inoculant
Valent MycoApply EndoPrime on corn

- Contains 4 species of mycorrhize to promote increased nutrient availability

- Help prevent drought stress with increased root growth

- Applied in-furrow with starter or water
Tryptophan concentrate

• Tryptophan acts as a natural growth stimulant similar to auxins

• This product is still in early development research

• Product will be provided
CHECK OUT OUR 2017 TRIAL RESULTS MAGAZINE!

THANK YOU TO ALL TRIAL PARTICIPANTS AND PROJECT SPONSORS

Fund in part by the soybean checkoff.