WINTER WHEAT SEED TREATMENTS for WISCONSIN

Dr. R. Borges and J. Gaska
UW Madison Department of Agronomy
Management Practices

• Cultivar: Hopewell
• Row Spacing: 7.5”
• Planting:
  ✓ Date: Sept. 24, 2002
  ✓ Rate: 1.5 million seeds/acre
  ✓ Depth: 1”
• Fertilizer: 60 lb N/a spring applied
• Herbicides: None
• Harvesting date: July 31, 2003
Products Tested

• Insecticides:
  ✓ Gaucho 480
  ✓ Gaucho XT (Insect/fung)
  ✓ Cruiser

• Fungicides:
  ✓ Raxil-Thiram
  ✓ Raxil MD
  ✓ Raxil MD Extra
  ✓ Vitavax 200
  ✓ Dividend Extreme
  ✓ Dividend XL
Popular Seed Applied Fungicides in WI

**Raxil/Thiram**

✓ Tebuconazole and thiram
✓ popular
✓ broad spectrum, low cost
✓ 3.5 to 4.6 oz/cwt
✓ Raxil-systemic, Thiram surface action
  • Strengths:
    – Excellent on seed borne bunt and smuts
    – Protection against *Fusarium spp.* – scabby seed

**Raxil MD**

✓ Tebuconazole and metalaxyl
✓ Systemic
✓ 5.0-6.5 oz/100 lbs
  • Strengths:
    – Excellent on seed borne bunt and smuts, *Pythium* root rot, *Septoria*
Popular Seed Applied Fungicides in WI

Raxil MD Extra

✓ Tebuconazole, metalaxyl, and Imazalil
✓ Systemic
✓ 5.0oz/100 lbs
  • Strengths:
    – Excellent on seed borne bunt and smuts, Pythium root rot, Septoria, adds stripe rust

• Vitavax 200

✓ Systemic activity of carboxin with the contact activity of thiram
  • Strengths:
    – Good on seed borne bunt and smuts, Pythium root rot
Popular Seed Applied Fungicides in WI

- **DividendExtreme**
  - Difenconazole (0.77 lb/gal) and Apron XL (0.19 lb/gal)
  - 2.0 to 4.0 fl. oz/cwt
    - Strengths:
      - Excellent on seed borne bunt and smuts

- **DividendXL**
  - Difenconazole (1.54 lb/gal) and Apron XL (0.13 lb/gal)
  - 1.0 to 2.0 fl. oz/cwt
    - Strengths:
      - Excellent on seed borne bunt and smuts
Seed Applied Insecticides

• Gaucho 480
  ✓ Imidacloprid
  ✓ Systemic
  ✓ 1 to 3 fl oz/cwt
    • Controls aphids which can transmit barley yellow dwarf

• Gaucho XT
  ✓ Combination insecticide and fungicide
  ✓ Imidacloprid, metalaxyl and tebuconazole
  ✓ 3.4 fl oz/cwt
## Economic Cost of Several Seed Treatments

<table>
<thead>
<tr>
<th>DividendXL RTA</th>
<th>Gaucho 480 insecticide</th>
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<tbody>
<tr>
<td>• 10 oz/cwt</td>
<td>• 1 to 3 oz/cwt</td>
</tr>
<tr>
<td>• 150 lb/a seed rate</td>
<td>• 150 lb/a seed rate</td>
</tr>
<tr>
<td>• $55/gallon</td>
<td>• $1100/gallon</td>
</tr>
<tr>
<td>• $6.50/acre</td>
<td>• $13 to $26/acre</td>
</tr>
<tr>
<td>• $2.58/60 lbs</td>
<td>• $5.16/60 lbs</td>
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</tbody>
</table>
Germination Rate

Seed Treatment

Germination (%)
Height at Maturity

Seed Treatment

- Cruiser/RaxThi
- Cruiser/DivXL
- Gauch/RaxThi
- Gaacho/DivXL
- Dividend XL
- Divind Extreme
- Vitavax 200
- Raxil MD Extra
- Raxil MD
- Raxil-Thiram
- Cruiser
- Gaucho XT
- Gaucho 480
- UTC

Height (inches)

NO EFFECT
Lodging (Belgium System 0-9)

Seed Treatment

- Cruiser/RaxThi
- Cruiser/DivXL
- Gauch/RaxThi
- Gaucho/DivXL
- Dividend XL
- Dividend Extreme
- Vitavax 200
- Raxil MD Extra
- Raxil MD
- Raxil-Thiram
- Cruiser
- Gaucho XT
- Gaucho 480
- UTC

Lodging (0=none, 9=severe)

NO EFFECT
Grain Yield

Grain Yield (bu/ac)

- Cruiser/RaxThi: 11.7 bu/ac
- Cruiser/DivXL: 11.7 bu/ac
- Gauch/RaxThi: 6.6 bu/ac
- Gaucho/DivXL: 6.6 bu/ac
- Dividend XL: 6.8 bu/ac
- Dividend Extreme: 6.8 bu/ac
- Vitavax 200: 6.8 bu/ac
- Raxil MD Extra: 6.8 bu/ac
- Raxil MD: 6.8 bu/ac
- Raxil-Thiram: 6.8 bu/ac
- Cruiser: 6.8 bu/ac
- Gaucho XT: 6.8 bu/ac
- Gaucho 480: 6.8 bu/ac
- UTC: 6.8 bu/ac
Test Weight

Seed Treatment

- Cruiser/RaxThi: 2.1 lb/bu
- Cruiser/DivXL
- Gaucho/RaxThi
- Gaucho/DivXL
- Dividend XL
- Dividend Extreme
- Vitavax 200
- Raxil MD Extra
- Raxil MD
- Raxil-Thiram
- Cruiser
- Gaucho XT
- Gaucho 480
- UTC

Test Weight (lb/bu)

- 50
- 51
- 52
- 53
- 54
- 55
- 56
- 57
- 58
## Summary of Wisconsin Winter Wheat Seed Treatment Data
### 1988 to 2003

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**Average over 11 experiments = gain 1.7 bu/ac**

**3-exp avg gain 6.8 bu/ac**
Historic Winter Wheat Yields in WI

Average State Yield

Yield (bu/a)

0 10 20 30 40 50 60 70 80


+1.48 bu/a/yr
Monthly Precipitation
Arlington, WI

<table>
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<tr>
<th></th>
<th>April</th>
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This presentation is available at http://soybean.agronomy.wisc.edu/
Monthly Average Temperatures
Arlington, WI

Higher response years
- Avg.
- 1996
- 1999
- 2003

Lower response years
- Avg
- 1997
- 1998
- 2000

Precipitation (in)

April  May  June
April  May  June

This presentation is available at http://soybean.agronomy.wisc.edu/
## Hypothesis of Seed Treatment Effects

<table>
<thead>
<tr>
<th>Fall Stand Establishment/Weather</th>
<th>Seed Treatment</th>
<th>Yield Potential into Spring</th>
<th>Spring Weather</th>
<th>Final Yield</th>
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<tbody>
<tr>
<td>Poor</td>
<td>Treated</td>
<td>Higher</td>
<td>Poor</td>
<td>Avg</td>
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<tr>
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</tr>
<tr>
<td>Good</td>
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<td>High</td>
<td>Poor</td>
<td>Good</td>
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<td></td>
<td>Untreated</td>
<td>High</td>
<td>Poor</td>
<td>Good</td>
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</tbody>
</table>

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Summary of Use of Seed Treatments on Wheat

• Advantages
  ✓ Control of early season seedling diseases
  ✓ Useful when seed and seedling are placed under stress
  ✓ Protect/increase seed viability

• Disadvantages
  ✓ Higher seed cost
  ✓ Hard to dispose of unneeded seed
  ✓ Time/cost of treating
  ✓ One seed treatment will not control all pathogens
  ✓ Variable yield response
Future Steps Needed

• Further test the insecticide seed treatment effect on Wisconsin grown winter wheat.
  ✓ 2 locations x 2 varieties x 16 treatments
  ✓ 4 insecticides, 7 fungicides, and 4 ins+fung
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• Summarize individual product performance
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• Summarize individual product performance

• Continuously monitor diseases and insect pest incidence in Wisconsin
Future Steps Needed

• Further test the insecticide seed treatment effect on Wisconsin grown winter wheat.
  ✓ 2 locations x 2 varieties x 16 treatments
  ✓ 4 insecticides, 7 fungicides, and 4 ins+fung
• Summarize individual product performance
• Continuously monitor diseases and insect pest incidence in Wisconsin
• More integration among the public and private individuals/institutions interested in promoting the Wisconsin wheat industry.
THANK YOU!