ON FARM EVALUATIONS OF SOYBEAN APHID CONTROL IN DODGE AND DANE COUNTIES

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Dodge County Plot Info

- 2001
  - Planted May 15
  - Treated 6/28, 7/21, 8/3
  - Warrior @ 3.5 oz./acre
  - Scouted weekly, 25 leaves per plot, top trifoliate leaf
  - 100+ aphids/trifoliate was the threshold
# 2001 Dodge County

## Scouting Information

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Scouting Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7/11 7/18 7/26 8/2 8/11 8/17 8/24 8/30</td>
</tr>
<tr>
<td>Check</td>
<td>0.1  0.2 23.1 100 100 43.4 8.8 1.2</td>
</tr>
<tr>
<td>7/21</td>
<td>0.0  2.2 56.5 40.0 7.4 0.6</td>
</tr>
<tr>
<td>8/3</td>
<td>1.8  1.4 0.2 0.0</td>
</tr>
<tr>
<td>Multiple</td>
<td>0.0  0.2 0.0 32.4 1.0 1.0 0.1 0.2</td>
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<tr>
<td>6/28,7/21,8/3</td>
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2001 Dodge County

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield (bu/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check</td>
<td>49.3b</td>
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<tr>
<td>7/21</td>
<td>53.5a</td>
</tr>
<tr>
<td>8/3</td>
<td>55.6a</td>
</tr>
<tr>
<td>multiple</td>
<td>55.9a</td>
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<tr>
<td>multiple = 6/28, 7/21 and 8/3</td>
<td></td>
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</tbody>
</table>
Dodge County Plot

- 2002
  - Planted May 22
  - Scouted weekly - 10 whole plants
  - 200 aphids per plant threshold
  - Treated July 19, August 2, August 9
  - Warrior 2.6 oz./acre
### 2002 Dodge County

<table>
<thead>
<tr>
<th>Date</th>
<th>Check plot # per plant</th>
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<tr>
<td>7/18</td>
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<td>5</td>
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<td>8/23</td>
<td>3.9</td>
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<tr>
<td>8/30</td>
<td>2.2</td>
</tr>
<tr>
<td>9/5</td>
<td>1</td>
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</table>

Any spray treatment knocked them down and treatment threshold was not reached again.
## 2002 Dodge County - Results

### 2002 Soybean Aphid Trial

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield</th>
<th>Rating</th>
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<tbody>
<tr>
<td>Check</td>
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<td>C</td>
</tr>
<tr>
<td>7/19</td>
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<td>AB</td>
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<td>A</td>
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<td>BC</td>
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<tr>
<td>Multiple</td>
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<td>ABC</td>
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### 2002 Soybean Aphid Trial

<table>
<thead>
<tr>
<th>Treatment Timing</th>
<th>Yield (bu./A)</th>
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<tbody>
<tr>
<td>Check</td>
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<tr>
<td>7/19</td>
<td>62.9</td>
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<tr>
<td>8/2</td>
<td>63.7</td>
</tr>
<tr>
<td>8/9</td>
<td>59.1</td>
</tr>
<tr>
<td>Multiple</td>
<td>61.9</td>
</tr>
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</table>
Dodge County

- 2003
  - Planted May 27
  - Scouted weekly – 10 whole plants
  - Treated July 24, July 31, and Aug 7
  - Mustang Max 3.2 oz/acre
  - Threshold 200 aphids per plant and 1000 per plant after R – 3
## 2003 Aphid Numbers

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Date</th>
<th>Aphid Numbers</th>
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<tbody>
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<tr>
<td>7/24</td>
<td>161</td>
<td>146 409 818 995</td>
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<tr>
<td>7/31</td>
<td>161</td>
<td>1000 296 479 232</td>
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<tr>
<td>8/7</td>
<td>161</td>
<td>1000 1000 592 494</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scout Date</th>
<th>7/23 7/30 8/6 8/15 8/22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth Stage</td>
<td>V8-9 R1-2 R3-4 R4 R5</td>
</tr>
</tbody>
</table>
2003 Dodge County Yields

2003 Soybean Aphid Trial
Hammer & Kavazanjian Farms
Dodge County UW-Extension & Soil Solutions Consulting

Yield bu/A

Check 24-Jul 31-Jul 7-Aug

Treatment Timing (statistics @ 90% confidence level)
Dane County - 2002

- No-till planted May 18\textsuperscript{th}
- Warrior at 3.2 oz/A in 20 GPA water
- Treated July 23\textsuperscript{rd} and Aug 5\textsuperscript{th}
- Aphid numbers remained lower than expected season long – failed to exceed 200 per plant
- Other insects
  - Bean leaf beetle, leafhopper
  - Present in extremely low numbers
Dane County – 2002

- After treatment no plots had any rebound
- Very low predator numbers all year
- Site was very dry mid June – August
- No yield response was expected
- BUT......
Dane County Yields

UTC  R2  R4

bu/A

64  66  68  70  72  74  76  78

74  77  69
Dane County 2003

- Planted May 18th
- Scouted weekly July 20th to Aug 15th
- 200 aphid per plant threshold
- Treated July 27th and Aug 5th
- Asana at 9oz/A
Dane County - 2003

Aphids Per Plant

<table>
<thead>
<tr>
<th>Date</th>
<th>UTC</th>
<th>R2</th>
<th>R4</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/20</td>
<td>&lt;100</td>
<td>&lt;100</td>
<td>&lt;100</td>
</tr>
<tr>
<td>7/25</td>
<td>808</td>
<td>808*</td>
<td>808</td>
</tr>
<tr>
<td>7/31</td>
<td>1000</td>
<td>550</td>
<td>1000*</td>
</tr>
<tr>
<td>8/8</td>
<td>1700</td>
<td>200</td>
<td>1100</td>
</tr>
<tr>
<td>8/15</td>
<td>3200</td>
<td>600</td>
<td>1600</td>
</tr>
</tbody>
</table>

* Indicates spray application made following count
All treatments differed at the 90% confidence level.
Dodge & Dane Economic Impact

5 trial years have an average increase of 10 bushels per acre per year

Cost of treatment $10-$14 per acre

3 year average price of Soybeans - $5.17

Net return to producers - $37 to $41 per acre per year

Return if all producers treated in both counties – over 5.8 million dollars to the Ag. economy
So what have we learned????

- Aphids don’t like it hot - 2002
- Lack of moisture is not a factor - 2003
- Numbers increase rapidly about Mid July and stay high until late August
- Predators cannot control a high population
- Last week of July & first days of Aug have been the most effective treatments
- They are here to stay – learn to spray
- Fine tuning of threshold numbers in the future
Reproductive Soybean Development Stages and Soybean Aphid Thresholds

R1 Stage soybean plant (beginning bloom)
One open flower at any node on the main stem:
A node is the part of the stem where a leaf is or has been attached.
Stage length 6 to 7 days: average 3
Aphid thresholds depend on actively increasing populations. Estimate 20-30 plants per acre or twice weekly to determine population density.
Action Threshold = 250 aphid/plant when population actively increasing.

R2 Stage soybean plant (full bloom)
Open flower at one of the two uppermost nodes on the main stem with a fully developed leaf.
Stage length 5 to 10 days: average 10
Action Threshold = 250 aphid/plant when population actively increasing.
This guideline incorporates an approximate 7-day lead time between scouting and treatment to make spray arrangements.

R3 Stage soybean plant (beginning pod)
Pod is 3/16 inch long at one of the four uppermost nodes on the main stem with a fully developed leaf.
Stage length 5 to 10 days: average 9
Action Threshold = 250 aphid/plant when population actively increasing.
This guideline incorporates an approximate 7-day lead time between scouting and treatment to make spray arrangements.

R4 Stage soybean plant (full pod)
Pod is 3/16 inch long at one of the four uppermost nodes on the main stem with a fully developed leaf.
The most critical time for soybean yield. Stress at this time can not be recovered and results in lower yield than at any other time.
Stage length 4 to 6 days: average 9
Thresholds are currently determined, but populations exceeding 250 plant and actively increasing need monitoring and treatment at grower discretion.

R5 Stage soybean plant (beginning seed)
Seeds is 1/8 inch long in the pod of one of the four uppermost nodes on the main stem with a fully developed leaf.
Stage length 11 to 20 days: average 15
Thresholds not currently determined, but populations exceeding 250 plant and actively increasing need monitoring and treatment at grower discretion.

R6 Stage soybean plant (full seed)
Pod containing a green seed that fills the pod cavity at one of the four uppermost nodes on the main stem with a fully developed leaf.
Stage length 9 to 13 days: average 11
Spraying after R6 has not been documented to protect yield.

R7 Stage soybean plant (beginning maturity)
One pod per node at any node on the main stem has reached its mature (brown or tan) pod color.
Plants will continue to lose leaves and dry down as the season progresses.
Stage length 7 to 10 days: average 9
Spraying at this time has not been documented to protect yield.

R8 Stage soybean plant (full maturity)
95% of the pods have reached their mature (brown or tan) color.
5 to 10 days of drying weather will result in 95% mature soybeans.

*Thresholds for R4-R5 stages continue to evolve. Spraying at R4-5 has been documented to protect yield. Growers and consultants are strongly advised to keep current with UWEX treatment thresholds on or before adaption.
What do we need to know yet???

- What is the effect of the honey dew?
- Is there an effect on bean quality?
- Aerial vs Ground spraying?
- Can disease control them?
- Variety Differences?
- Will seed treatments work?