BMP’s for Soybean Aphid Vectored Viruses in Snap Bean

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Goal

- Develop integrated approach that would optimize yield and quality impacts and maximize returns

- Cost of management
  - Direct cost related to pesticide use
  - Indirect cost – non adapted varieties
    - Lower yielding
    - Lower quality

- Integrate cultural practices
  - Avoidance
Objectives

- Determine effect of planting date, varietal differences in susceptibility to virus, and aphid management strategy on yield and quality

- Evaluate the impact of management system on aphid pressure and development of virus symptoms.
Material and Methods

- Arlington Horticulture Farm
- RCB with 4 reps and 3 level factorial
  - Planting date
    - 5/22, 6/19, 7/15
  - Variety
    - MV185 (R), Hystyle (S)
  - Insect management strategy
    - +/- Gaucho seed treatment
    - +/- Stylet oil
Managed snap bean according to current production recommendations
- Leaf hopper management
  - Sevin until pin bean stage
- Leafhopper and European Corn Borer management
  - Capture from pin bean stage until harvest

Data collection
- Yield, size grade
- Phenological development
- Soybean aphid per plant
- Virus symptoms
  - ELISA
Snap Bean Yield by Variety

<table>
<thead>
<tr>
<th>Variety</th>
<th>1-3's</th>
<th>4-5's</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S-type</td>
<td></td>
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</tbody>
</table>

Yield (ton/ A)
Snap Bean Yield by Planting Date

<table>
<thead>
<tr>
<th>Harvest Date</th>
<th>1-3's</th>
<th>4-5's</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/24 &amp; 8/1</td>
<td>1.5</td>
<td>2.5</td>
<td>4.0</td>
</tr>
<tr>
<td>15-Aug</td>
<td>3.0</td>
<td>4.0</td>
<td>7.0</td>
</tr>
<tr>
<td>12-Sep</td>
<td>2.0</td>
<td>3.0</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Yield (Ton/A)
Pest Pressure

- Little aphid pressure during 2002
  - First found on 7/29
    - 1-5 aphids per leaf
      - 3rd planting only (1-2 trifoliate)
      - 2nd planting flowered on 7/24
      - 3rd planting flowered on 8/20
  - Few if any aphids after 8/7
- Insect management had no effect on yield or disease severity
Elisa Results 9/1 - AMV

Variety

R type

S type

none
Gaucho
Oil
Gaucho + Oil

+ ELISA Frequency

0
1
2
3
4

Variety

R type

S type

Gaucho
Oil
Gaucho + Oil
Elisa Results 9/1 - CMV

Variety

- none
- Gaucho
- Oil
- Gaucho + Oil

R type

S type

+ ELISA Frequency

0 1 2 3 4
Summary

- No yield effect by aphid transmitted virus
  - Aphids preferred youngest snap bean
- Yield reduction by variety
  - S out yielded R
  - S better size
- S-type showed injury
  - Last planting only
  - AMV only found in S
  - CMV found in both R and S
    - Incomplete resistance
    - Susceptible under high disease and aphid pressure
  - Unable to determine management impacts on ELISA
Conclusions

- When is it economical to use virus resistant varieties

- 2002 saw little impact by aphid transmitted virus
  - Losses on very late planted snap bean in EC WI

- Predict severity of soybean aphid and virus