Implementing Farm-Level IPM in Strawberry

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## Update on new spray materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Active Ingredient</th>
<th>Mode of Action</th>
<th>IRAC</th>
<th>Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beleaf</td>
<td>Flonicamid</td>
<td>Feeding blocker</td>
<td>9C</td>
<td>Was available for Oct 2012; will be available this season with MRL established</td>
</tr>
<tr>
<td>Belay</td>
<td>Chlothianadin</td>
<td>Neonicotinoid</td>
<td>4A</td>
<td>(none)</td>
</tr>
<tr>
<td>Bexar*</td>
<td>Tolfenpyrad</td>
<td>METI</td>
<td>21A</td>
<td>Reg expected 2015</td>
</tr>
<tr>
<td>Closer*</td>
<td>Sulfoxaflor</td>
<td>Sulfoxaflor</td>
<td>4C</td>
<td>Reg expected 2014</td>
</tr>
</tbody>
</table>
Lygus Bug Management Program

• 2010-11 program showed:
  – In-field detection was late; poor monitoring
  – Evidence for resistance

• 2011-12 season:
  – Implemented a monitoring training program on 20+ farms to address key questions
  – Large number of bioassays for area-wide picture of resistance
2012 Program

Monitoring Program

• 28 Scouts trained early season (March-April)
  • Santa Maria
  • Salinas/Watsonville

• 72% of participants continued through season

Bioassays

• Tested 26 fields (1st and 2nd year fields)

• Watsonville-Salinas and Santa Maria-Guadalupe
2012 Lygus Monitoring Data

Field 4

Field 27

Average count per 20 plant sample

Arrows indicate spray dates

Dotted line indicates threshold
2nd year field adjacent, no vacuum use

Average count per 20 plant sample

- Avg Adults
- Avg Small Nymphs

Site 3
2nd year field adjacent, used bug vacuum

Average count per 20 plant sample

- Avg Adults
- Avg Small Nymphs

Site 22
## Effect of vacuuming and second year strawberries on adult Lygus populations

<table>
<thead>
<tr>
<th>Field Characteristics</th>
<th>% of fields with &gt; 5 Lygus adults per sample during season</th>
</tr>
</thead>
<tbody>
<tr>
<td>No 2(^{nd}) year adjacent + No vacuum use</td>
<td>9%</td>
</tr>
<tr>
<td>2(^{nd}) year adjacent + Vacuum use</td>
<td>20%</td>
</tr>
<tr>
<td>2(^{nd}) year adjacent + No vacuum use</td>
<td>75%</td>
</tr>
</tbody>
</table>
89% of tests showed <50% mortality, overall avg 27% mortality
Resistance – Malathion + Actara

3% tested had <50% mortality, 69% had >80% mortality, overall avg 82%
• Second year fields are the most important local source of Lygus pressure (rated 4.8/5, #1 source)

• 88% of growers surveyed said they would support restrictions on second year strawberries
Grower Survey

• Monitoring data suggests field vacuums work

• None of the program participants in Santa Maria vacuumed and 20% use vacuums elsewhere

• 50% vacuumed participating sites in Wats/Salinas, 70% use vacuums elsewhere
Grower Survey

- 82% of growers surveyed say they use IPM
- Bioassay data shows widespread resistance
- Pesticide use patterns show little resistance management, few IPM approaches
- Poor monitoring
- Low vacuum use, no evidence of biological controls in conventional fields
Plan for Next Season (2013)

• Continue work on Lygus with focus on evaluating different IPM strategies & developing an effective IPM program
  – Resistance management, including new chemistries
  – Test vacuum use and cost efficacy in first year and second year fields
  – Management in second year fields

• Start working on mites
  – Resistance testing
  – Learn about current grower practices

• Whiteflies, Drosophila, other pests...
Whitefly Management Focus Group

• Facilitate neighborly coordination of area-wide management in delineated hotspot district

• Changes in labor and duration/overlap of production season could exacerbate other pest problems...Drosophila, corn earworm....