IRAC-US Update

Caydee Savinelli
Graham Head
IRM Implementation / Regulation
Key Groups

IRAC-US

Industry
Insecticides or Traits

Universities
Crop Consultants

U.S. EPA
Insecticide Resistance Management

EPA’s Role

- For conventional pesticides, EPA has historically relied on voluntary measures to encourage proactive resistance management by pesticide users.

- Agency-approved labels are an important tool, but resistance management labeling is voluntary (not mandatory for registrants).

- Bt Plant-Incorporated Protectants (PIPs) - a special case:
  - EPA places a high value on preserving the significant agricultural and environmental benefits of Bt PIPs
  - EPA requires an Insect Resistance Management (IRM) plan for each registered Bt crop.
IRAC-US
Interactions with EPA, BEAD

• Meet annually with EPA, Biological and Economic Analysis Division
  ➢ BEAD provides pesticide use-related information and economic analyses in support of pesticide regulatory activities.
  ➢ Increased focus on weed resistance has led to BEAD’s interest in resistance management plans more generally (though purely voluntary in form at this point).
  ➢ BEAD is involved in resistance management discussion with all of the RACs.

• IRAC-US has provided a list of key pests with high potential for resistance to EPA, BEAD

• IRAC-US has provided “Overview of an Insect Resistance Management (IRM) Plan for Plant Protection Insecticides” in 2013.
  ➢ IRAC-US will meet in April with EPA to discuss the IRM Plan.
  ➢ Mark Whalon, MSU is the ESA liaison to the EPA.
  ➢ IRAC-US has regular interactions with the ESA liaison representative to facilitate our discussions with the EPA.
IRAC-US IRM Plan
Plant Protection Insecticides

- Determine insecticide mode of action.
- Establish the baseline susceptibility of key high-resistance-risk pests prior to and/or in the early years of commercialization.
- Include mode of action group on product labels.
- Provide resistance management recommendations on product labels.
- Encourage use of Integrated Pest Management (IPM) practices by growers.
- Develop educational literature for growers, researchers and extension agents to increase resistance management awareness, particularly at the grower level.
- Monitor product performance over a wide range of geographies and observe or track changes in the susceptibility of pest populations over time.
Insecticide Resistance Management
Universities & Consultants Role

• Lead or participate in the development of IRM plans
• Provide education and lead implementation of IRM plans in respective geographies for the growers and crop consultants.
• Monitor susceptibility of insects of concern.
• Provide feedback to companies on successes and challenges with IRM plans.
IRAC-US
Interactions with NAICC

• NA ICC - National Alliance of Independent Crop Consultants
  ➢ Jim Steffel - Ad Hoc member of IRAC-US

• IRAC-US participates in NAICC annual meeting
  ➢ Present training presentations
  ➢ Distribute literature

Daniel R. Vincent, Ph.D.
DuPont Crop Protection
IRAC-US Communications

Electronic Resources to Assist in Insecticide Resistance Management Decisions.
Neonicotinoid IRM Plan & Implementation - *Bemisia tabaci* - Arizona/California vs. Florida

**AZ / CA Recommendations**
- Guidelines based on the cropping system

**FL Recommendations**
- Cultural Controls
  - Crop Hygiene
  - Tomato free period
- Neonicotinoids
  - Application Method & Timing

---

**Summary Guidelines**: Maximum number of uses per crop season for neonicotinoids in three different cropping communities.

<table>
<thead>
<tr>
<th>Community</th>
<th>Cotton</th>
<th>Melons</th>
<th>Vegetables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-Crop</td>
<td>0</td>
<td>1*</td>
<td>1**</td>
</tr>
<tr>
<td>Cotton / Melon</td>
<td>1</td>
<td>1*</td>
<td>—</td>
</tr>
<tr>
<td>Cotton-Intensive</td>
<td>2</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

*Soil only; **Soil or Foltar*
IRM Plan & Implementation
Diamide Insecticides - IRAC-US Diamide WG

- Labels - MoA Symbol, Resistance Management Language
- Collaborate with University Research & Extension
  - Develop best management guidelines for IRM
  - Literature pieces
  - Address emerging issues

![Image of table showing relative efficiency index for insecticides in desert](image-url)
IRAC-US Funded Projects

• IRAC-US provides seed money for resistance management projects
  ➢ Receive inquiries from university cooperators
  ➢ Every couple of years we have a scoping exercise that includes key academics and this leads to broad project priorities.
  ➢ Hosted a roundtable meeting in 2011 to solicit new projects.

• Past Funded Projects
  ➢ Urgent Needs for Pyrethroid Resistance Management in the Bollworm, H. zea - B. Hopkins & P. Pietrantonio, Texas A&M
  ➢ North American Zea Resistance Mapping and Management - B. Hutchison, University of Minnesota, S. Fleisher, Penn State University & G. Payne, University of West Georgia
  ➢ Group 28 Diamide Resistance Management - Diamondback Moth in Cole Crops
## Current Projects - Funded by IRAC-US

<table>
<thead>
<tr>
<th>Research</th>
<th>Investigators</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Management of Insecticide Resistance in Asian Citrus Psyllid (ACP)</td>
<td>- Phil Stansly, University of Florida</td>
<td>- Year 2 of 3 Year Study</td>
</tr>
<tr>
<td>Populations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Resistance risk assessment in populations of the Asian citrus psyllid</td>
<td>- Patricia V. Pietrantonio &amp; Cecilia Tamborindeguy,</td>
<td>- Year 2 of 3 Year Study</td>
</tr>
<tr>
<td>(Diaphorina citri) to recommended insecticides: resistance monitoring</td>
<td>Texas A&amp;M University</td>
<td></td>
</tr>
<tr>
<td>in Texas and Florida, and establishment of the Asian Citrus Psyllid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(ACP) resistance website portal.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Assessment of Southern Chinch Bug Insecticide Resistance Prevention</td>
<td>- Eileen Buss, University of Florida</td>
<td>- Year 2 of 2 Year Study</td>
</tr>
</tbody>
</table>
## 2014 Proposed ESA Symposium
Managing resistance in a changing landscape IRAC US Symposium Series: No.10

<table>
<thead>
<tr>
<th>Topics</th>
<th>Speakers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Tools – cost &amp; time for discovery, regulation challenges,</td>
<td>Tom Sparks, Dow</td>
</tr>
<tr>
<td>enthusiasm &amp; high adoption rates for new technology</td>
<td></td>
</tr>
<tr>
<td>Change in farm landscape</td>
<td>Terry Hurley, University of Minnesota</td>
</tr>
<tr>
<td>Cotton – changes in landscape and pest challenges, include seed</td>
<td>Angus Catchot, Mississippi State University</td>
</tr>
<tr>
<td>treatments</td>
<td></td>
</tr>
<tr>
<td>Exotics – spotted winged drosophila</td>
<td>Peter Scherer, University of Oregon</td>
</tr>
<tr>
<td>Exotics – Asian citrus psyllid</td>
<td>Beth Grafton Cardwell, University of California</td>
</tr>
<tr>
<td>Exotics – Asian citrus psyllid</td>
<td>Michael Rogers, University of Florida</td>
</tr>
<tr>
<td>Seed Treatment Use</td>
<td>Christian Krupke, Purdue University</td>
</tr>
<tr>
<td>Game for Lygus control over large areas and implication for IRM</td>
<td>Peter Ellsworth, University of Arizona</td>
</tr>
<tr>
<td>Corn earworm and Pest Watch – changes in cropping landscapes</td>
<td>Shelby Fleisher</td>
</tr>
<tr>
<td>Fall armyworm in Puerto Rico</td>
<td>Hector Portillo</td>
</tr>
<tr>
<td>Changing landscape - CRW - causes of the issues and what are growers</td>
<td>Graham Head</td>
</tr>
<tr>
<td>willing to accept</td>
<td></td>
</tr>
</tbody>
</table>
Questions