IR-4 Global Residue Studies

Results and Potential Positive Outcomes for Agriculture

Dr. Dan Kunkel
Associate Director, IR-4 Program
Chair, Global Minor Use Steering Committee
To Facilitate Registration of Sustainable Pest Management Technology for Specialty Crops and Minor Uses
Since its inception, IR-4 has facilitated the registration of over 26,000 crop uses.

- 15,000 food uses and 11,000 ornamental uses
- Numerous biopesticides (sprayable BT, spinosad for organics)
- Biotech-Plum Pox resistant stone fruit
IR-4 HQ
IR-4 Regional Program Office
State Field Research Centers/Food Use
State Field Research Centers/Ornamentals and Non-food Use
ARS Labs
ARS Field Research Centers Food Use
ARS Field Research Centers Ornamental
ARS Field Research Centers Ornamental and Food Use

85 MOR studies supported by 550 field trials

Hawaii = ▲
Puerto Rico = O

Approximately 120 staff across the country
<table>
<thead>
<tr>
<th>Chemical</th>
<th>Commodities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyrimethanil</td>
<td>Ginseng, Lemon, Berries (low growing)</td>
</tr>
<tr>
<td>Flutolanil</td>
<td>Brassica (head and stem), Brassica (leafy greens)</td>
</tr>
<tr>
<td>Spirotetramat</td>
<td>Artichoke (globe), Banana, Plantain, Bushberry, Cranberry, Coffee, Bulb Vegetables, Pomegranate, Pineapple, Watercress</td>
</tr>
<tr>
<td>Propiconazole</td>
<td>Bean (dry, lima, and snap) Mint, Pineapple, Blueberry, Caneberry</td>
</tr>
<tr>
<td>Chemical</td>
<td>Commodities</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Cyprodinil</td>
<td>Carrot, Radish, Spinach, Lettuce, Watercress, Brassica (head and stem), Brassica (leafy greens), Basil, Chives, Parsley, Bean (snap, lima, and dry), Pepper (and other fruiting vegetables), Cucurbits, Lemon, Lime, Avocado, Lychee, Caneberry, Strawberry, Blueberry, Kiwifruit</td>
</tr>
<tr>
<td>Fludioxonil</td>
<td>Carrot, Radish, Ginseng, Spinach, Lettuce, Brassica (head and stem), Brassica (leafy greens), Basil, Chives, Parsley, Bean (snap, lima, and dry), Pepper (and other fruiting vegetables), Cucurbits, Lemon, Lime, Avocado, Lychee, Raspberry, Strawberry, Blueberry, Kiwifruit, Pineapple</td>
</tr>
</tbody>
</table>
Global Residue Studies

- Tools for Solutions, 2010 IUPAC, B. Madden
  - Crop Grouping
  - Global Zoning (Global data sets)
  - Incentives for Industry
  - JMPR/Codex Process Initiatives
  - Capacity Building (Global data generation hubs)
  - Global Minor Use Foundation (pending...houses public funding for Global residue data projects)
IR-4 Global Residue Studies

- Zoning work with tomato
- GLP MOR on blueberry
- Capacity Development - Tropical fruits in Asia, Africa, Latin America
The purpose of the Global Residue study is to compare residues of 4 chemicals on tomato across a wide variety of geographical and environmental zones.

In order to minimize differences:
- Identical spray equipment
- Test substances were pre-measured
- A training video on how to conduct the study was posted on YouTube.

Samples included a time zero sample to measure variability other than the environment and samples were taken at 24 and 72 hours after application.

*funded by USDA TASC grant.
GLOBAL RESIDUE STUDY-Tomato

27 sites in 22 countries.
CONCLUSIONS

• Calculated MRLs were similar (difference 0.1 ppm or less) across all climatic zones and continents compared to the overall MRL (Complete data set).

• Is being analyzed statistically across sample times, climate, etc.

• Publication being prepared
GLOBAL RESIDUE STUDY - Blueberry

26 total field sites in 9 countries
BYI 02960
Blueberry Global Residue Project Status (IR-4 & PMC)

- Study conducted under one protocol (one GAP), IR-4 is the Sponsor and Study Director.
- All samples analyzed by Bayer Crop Science Laboratory
- Study submitted for Global Joint Review Fall 2012.

- LOWBUSH Blueberry:
  - 3 trials in Nova Scotia (one decline)
  - 1 trial in Maine

- Highbush Blueberry:
  - 2 trials in New Jersey
  - 3 trials in Michigan (one decline)
  - 2 trials in North Carolina
  - 1 trial in Oregon
  - 1 trial in Quebec

- European trials
  - 1 trial in Spain - decline
  - 1 trial in Denmark
  - 2 trials in the U.K. – decline
  - 1 trial in Italy - decline
  - Note: 2 trials using “protected” crop.

- Other Sites (Highbush)
  - 3 trials in Australia
  - 2 trials in New Zealand
  - 3 trials in Chile (one decline)

26 total field sites in 9 countries
### Analysis Using the OECD MRL Calculator

<table>
<thead>
<tr>
<th>NAFTA sites only</th>
<th>Global data (all sites)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 13 field trials</td>
<td>• 26 field trials</td>
</tr>
<tr>
<td>• Lowest residue</td>
<td>• Lowest residue</td>
</tr>
<tr>
<td>0.290 ppm</td>
<td>0.193 ppm</td>
</tr>
<tr>
<td>• Highest residue</td>
<td>• Highest residue</td>
</tr>
<tr>
<td>2.59 ppm</td>
<td>2.59 ppm</td>
</tr>
<tr>
<td>• Median residue</td>
<td>• Median residue</td>
</tr>
<tr>
<td>0.834 ppm</td>
<td>0.867 ppm</td>
</tr>
<tr>
<td>• Mean residue</td>
<td>• Mean residue</td>
</tr>
<tr>
<td>0.912 ppm</td>
<td>0.974 ppm</td>
</tr>
<tr>
<td>• SD</td>
<td>• SD</td>
</tr>
<tr>
<td>0.630</td>
<td>0.632</td>
</tr>
<tr>
<td>• Unrounded MRL</td>
<td>• Unrounded MRL</td>
</tr>
<tr>
<td>3.431 ppm</td>
<td>3.504 ppm</td>
</tr>
<tr>
<td>• Rounded MRL</td>
<td>• Rounded MRL</td>
</tr>
<tr>
<td>4 ppm</td>
<td>4 ppm</td>
</tr>
</tbody>
</table>
Capacity Building
Cooperation with USDA-FAS
Why is IR-4 involved

Vision of global network of capable minor use programs that can address grower needs and generate data.

- Help establish and mentor these minor use programs (e.g. China, Brazil, Costa Rica)
- Partner with other data development groups
- Promote lower risk products
Tropical Fruit Residue Study
Residue data generation

IR-4 and FAS Project Coordination

Asia

Latin America

Africa

US, Canada others???

JMPR joint submission

Funding from STDF
*contributions from manufacturers, USDA, FAO, USAID others
Global Residue Data Generation Project
Funding

- **STDF**
  - ASEAN: $650k
  - Africa: $450k
  - Latin Am: $375k

- **US State Dept**
  - North Africa: $250k

- **Inter-America Development Bank**
  - Latin Am: $150k

- **USAID**
  - Latin Am: $150k
Why not combine Global Datasets?

- OECD Paper in 2003 - published
- OECD Guidance Document on Crop Field Trials (Published and being updated) – share data (up to 40%)
- US and Canada have been combining data for years
- JMPR/Codex –
  - Earlier papers say they will consider Global data sets
  - 2013 CCPR – NO??

- Is the world ready for this? For Commodities in trade?
- The data are more robust and allows regulators more overall data to make a decision – even for minor uses.
Case study: 2013 IR-4 Residue Program

• Canadian Partnership
  – 82 Residue Studies
    • 16 joint studies with PMC
    • 564 Field trials
    • 55 being conducted by Canada
    • $302,500 direct savings to the IR-4 program
    • PMC is SD for two studies – They cover administration of the study as well a analytical cost (min of $200,000).
Global network of capable minor use programs working together to solve the MUP
- Help establish and mentor these minor use programs
- Partner with other data development groups
- Address the many unresolved needs.

Global Minor Use Foundation
Requests Prioritized at Food Use Workshop (September 17-18, Albuquerque, New Mexico)

Grower, researchers & industry attend
Identify top research priorities
Use consensus decision making process by growers and researchers only

Stakeholder Involvement

500 possible projects

Web Nomination

200 remaining projects

Approved Research Plan for following year

85 Studies
Thank You!

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