EPA PPDC - Resistance Management Working Group

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OCTOBER 28, 2020

Diamondback moth

EPA PPDC - Resistance Management Working Group

Work Group Goal:

Develop recommendations to EPA on how the agency can assist stakeholders in addressing the challenges of conventional pesticide resistance.

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Today's Session / 2:30pm – 3:45pm

- Resistance Management Background and Draft Charge Questions
- Draft Charge Question Discussion with PPDC Members
- Logistics and Query on PPDC Member Interest in Participating

Why is EPA Interested in Encouraging RM?

EPA wants to enhance pesticide stewardship to sustain effectiveness of pest management tools while also ensuring no unreasonable adverse effects to human health or the environment, as the FIFRA statute requires.

Effective RM should result in lower overall pesticide loading in the environment by reducing the need for repeated pesticide treatments.

EPA has an interest in ensuring responsible management of tools because:

- Considerable Agency resources are put into review and approval of these tools.
- The Agency wants to help preserve safe, effective pest management options for growers.

Regulatory Context for EPA's Activities to Enhance RM for 'Conventional' Pesticides

- For all agricultural pesticides except PIPs, EPA takes a 'voluntary' approach in implementing a more consistent effort aimed at helping pesticide users slow or avoid the development of pesticide resistance.

- EPA uses Pesticide Registration Notices (PRNs) to provide non-binding guidance to pesticide registrants and EPA personnel regarding pesticide registration activities and decisions.

Regulatory Context for EPA's Activities to Enhance RM for 'Conventional' Pesticides

Two PRNs were issued in 2017 to provide guidance to pesticide registrants and EPA personnel on RM language on labels:

- PRN 2017-1: "Guidance for Pesticide Registrants on Resistance Management Labeling" - Updates an existing PRN (2001-5) and recommends additional resistance management information for pesticide labels.
- PRN 2017-2: "Guidance for Herbicide Resistance Management Labeling, Education, Training, and Stewardship"- Focuses on the overall strategy to manage herbicide resistance during registration and registration review.

- These PRNs are used to guide RM label development in registration and registration review work

Bt Crops IRM as a Potential Model

- Insect Resistance Management (IRM) is a plan to keep Bt crops effective for as long as possible
- IRM has helped maintain much of the effectiveness of Bt crops for nearly 20 years
- PPDC played a key role in confirming the public good of Bt
- We want to preserve the benefits to growers, human health, and the environment
- Resistance to pesticides have been considered an unreasonable adverse effect under FIFRA

OPP's Role in Regulating Pesticides Engineered into Plants

For plants, EPA considers a pesticide the pesticidal substance introduced into the plant and the genetic material necessary to produce the pesticidal effect

The Agency refers to this mixture as a "plant-incorporated protectant" or a "PIP"

- Under 40 CFR 174, a PIP is a "pesticidal substance that is intended to be produced and used **in a living plant**, or in the produce thereof, and genetic material necessary for production of such a pesticidal substance..."

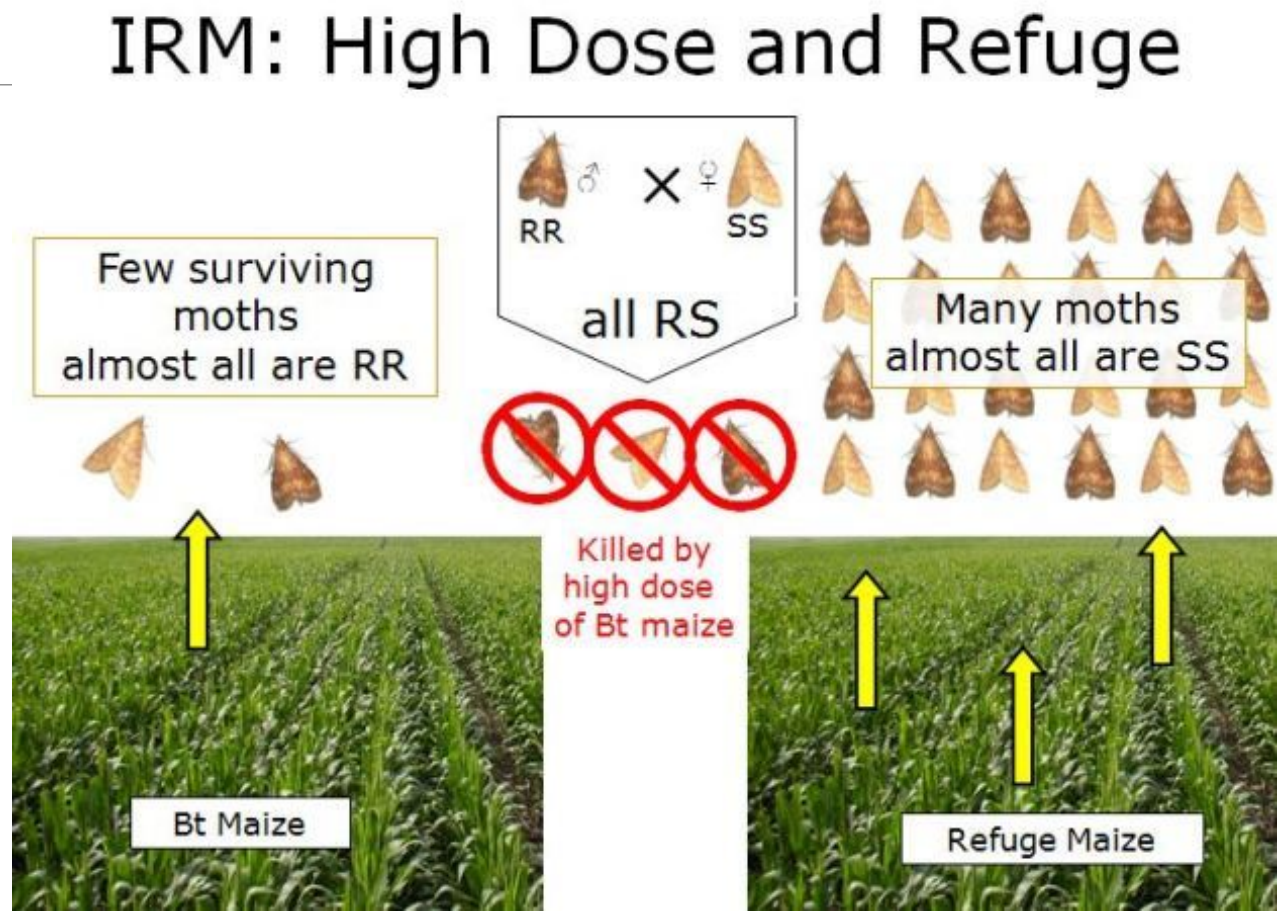
- Registered 100+ PIP products to date
  - Majority are *Bacillus thuringiensis* Cry protein-based for insect control

PIPs: *Bt* corn and cotton mandatory IRM program

EPA mandates the IRM strategies for*Bt* corn and cotton through the terms of registration of these products

Resistance is mitigated using non-*Bt* crop refuge and resistance monitoring

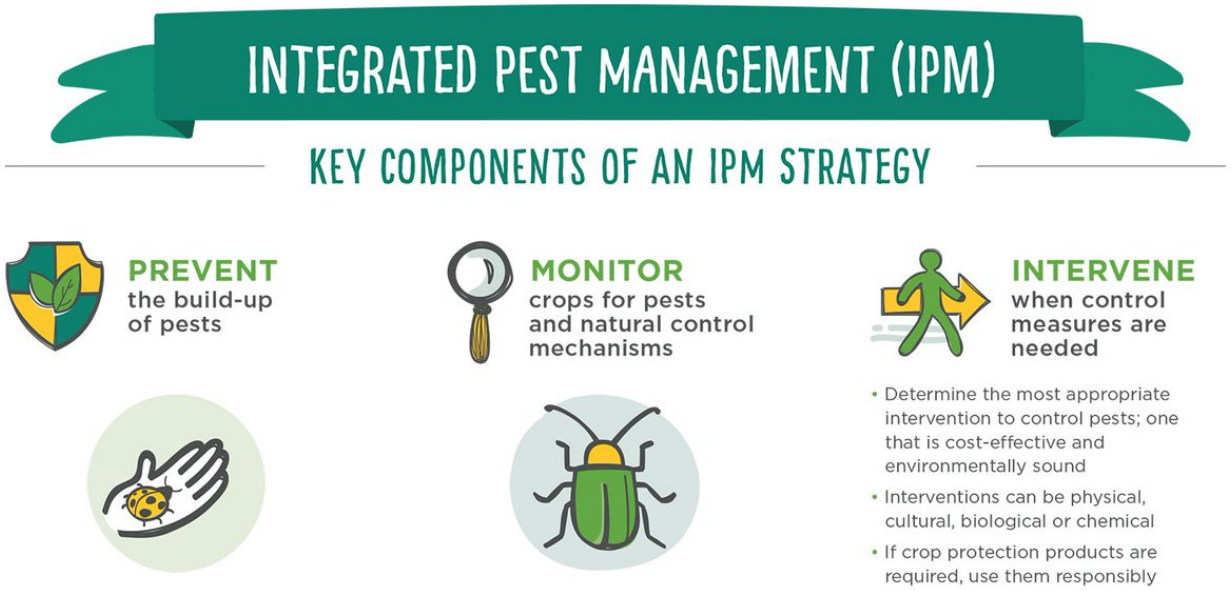
There are voluntary IPM protocols used in conjunction with *Bt* IRM (e.g., the use of BMPs) when resistance is detected



Stewardship for *Bt* Crops

Prior to and after insect resistance detection in *Bt* PIPs, EPA and industry encourage the use of voluntary BMPs.

- Registrants are required to develop and encourage growers to follow an IPM-based stewardship plan
- IPM Tools: non-host crop rotation, use of pyramids/alternate modes of action, non-*Bt* corn
- Limit use of varieties with only one Bt trait
- Recommendation to limit use of seed applied insecticides with Bt corn due to resistance concerns



How?

- EPA and Industry have a shared goal of preserving Bt PIPs via IRM
- IRM is implemented by registrants via terms of registration
  - Companies implement at the grower level
  - EPA maintains oversight
  - Annual reporting to EPA

Compliance and Education

EPA has not used its traditional compliance mechanisms for Bt PIPs IRM, but instead works through the terms of registration with the companies

Compliance (mandated by terms of registration)

- For IRM strategies requiring grower actions (e.g., structured refuge)

Education

- Important for compliance and resistance monitoring

Reports to EPA

- Annual reporting on resistance monitoring, compliance, IPM stewardship (Bt corn)

Bt PIPs Resistance Monitoring

Resistance Monitoring conducted by registrants

- Required for the major target pest(s) of the PIP
- Two levels of monitoring:
  - Monitoring for changes in susceptibility through lab testing insects
  - Grower reported field damage reports investigated by industry

Mitigating Resistance: Bt PIPs Remedial Action Plan

Remedial Action

- Objective: to contain or slow the spread of resistant populations
- Best Management Practices (BMPs): alternate control measures for immediate and subsequent growing seasons, crop rotation, use of alternate modes-of-action
- Increased resistance monitoring
- Communication: Notification to stakeholders (growers, consultants, seed distributors, university cooperators, federal/state authorities

Bt PIP IRM Success in the U.S.

- Successes (so far…)
  - **Pink bollworm: pest eradicated from Southwestern US**
  - European corn borer
  - Tobacco budworm
  - Common factor: high dose
- Challenges to Resistance…
  - Corn rootworm
  - Cotton bollworm
  - Fall armyworm
  - **Common factor**: lack of high dose

Bt PIPs IRM - Summary

- Bt technology has reduced pesticide use and increased yield
- Bt is popular with EPA, growers, and industry groups
- EPA and Industry have worked together to prevent pest resistance to Bt
- When resistance has arisen to pests, like corn rootworm, EPA and industry have worked together to delay resistance via voluntary agreements and negotiations

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Work Group Goal:

Develop recommendations to EPA on how the agency can assist stakeholders in addressing the challenges of conventional pesticide resistance.

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Draft Charge Questions for Discussion

1. Are there current EPA policies that positively or negatively affect conventional pesticide resistance management? What policies could be re-worked to more positively address resistance management?
2. Are there current Industry programs that positively or negatively affect conventional pesticide resistance management? Would EPA have a role in those programs, and what might that be to positively influence industry?

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Draft Charge Questions for Discussion cont.

3. Are there incentives (for registrants or pesticide users) that could be considered related to conventional pesticide regulation that might positively affect resistance management? Are there other ways in which the agency can work with stakeholders (e.g., growers, commodity groups, academics) to cooperatively address resistance management?
4. Are there elements from EPA's Bt PIP resistance management program that could be used in conventional pesticide resistance management?

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- PPDC Member Interest in Participating
- Logistics