The Canadian Regulatory View of Insect Resistance Management

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Canada

Overview

- Pest Management Regulatory Agency (PMRA): Canadian regulatory framework
- Sources of resistance risk
- Regulatory Activities at PMRA
- Regulatory options and potential solutions

Canadian Regulatory Framework

- Regulation of pest control products in Canada: Health Canada's Pest Management Regulatory Agency (PMRA)
- Pest Control Products Act:
  - Prevent unacceptable risks to people and the environment from the use of pest control products
  - Ensure that pest control products have acceptable value

Value Assessment (PMRA)

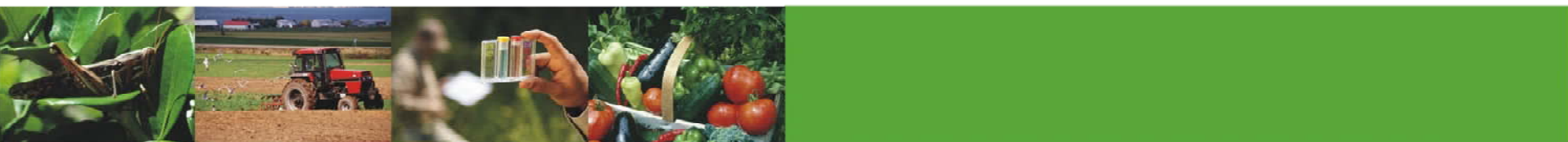
- Includes assessment of efficacy, adverse effects on crop/site, contribution to sustainability, and related social or economic impacts
- Ensures that appropriate application rates and use directions are on the product label
- Value and Sustainability Assessment Directorate

Evaluation of Resistance Risk and Resistance Management at PMRA

- Evaluated in the context of sustainability
- Considered when application rates, application frequencies, and timing of applications are assessed

Sources of Resistance Risk

- Inherent risk factors: due to the interaction between the pest and the pesticide
- Agronomic risks: associated with how the product is used



Inherent Risk Factors

- Pesticide-Associated Risks:
  - Mode of action
  - Persistence of activity
  - Ease of metabolism of the pesticide

Inherent Risk Factors

- Pest-Associated Risks:
  - Generation time
  - Fecundity and distribution of progeny
  - Pest dispersal
  - Underlying genetics that confer resistance
  - Fitness of resistant individuals

Agronomic Risk Factors

- Application rates
- Number of applications per season
- Number of sequential applications
- Crop production system
- Geographical isolation of pest
- Rotation of products with alternative modes of action
- Use of complimentary pest control practices (e.g., cultural controls)

Regulatory Strategies for Resistance Management at PMRA

- Regulators can influence a subset of the agronomic sources of resistance risk
- This is mainly limited to the regulatory process and can be achieved through labelling

Value Considerations

- What are the registered alternative active ingredients/modes of action?
- What is the inherent risk relative to the active ingredient?
- What is the inherent risk relative to the target pest?
- What is the agronomic risk relative to the proposed use directions?

Mitigation of Resistance Risks Through Labelling

- Revision of use directions, where appropriate
  - Application rate
  - Application timing
  - Number of applications per season
  - Number of sequential applications
  - Require tank mixes or mode of action rotation in sequential applications
- Resistance management labelling

PMRA Regulatory Directive DIR99-06

- Voluntary Pesticide Resistance Management Labelling Based on Target Mode of Action (DIR99-06)
- Developed and published in parallel with the Office of Pesticide Programs of the United States Environmental Protection Agency (Pesticide Registration Notice 2001-05)

PMRA DIR99-06

- Identifies a standard format for displaying group identification symbols on new and existing product labels
- Includes guidance on resistance management wording to include in the use directions
- Applied to commercial class pesticides

Regulatory Activities at PMRA

- Update DIR99-06
- Registration of new modes of action: through global and joint reviews and through other registration processes (e.g. minor use)
- Discussion and collaborative efforts at provincial, national and international level

Resistance Management Opportunities

- Work in partnership with researchers, extension specialists, industry and growers
- Ensure that product labels are being read and understood
- Ensure that regulatory recommendations are consistent with best practices for resistance management
- Encourage good product stewardship

Pest Resistance Management Workshop

- February 2008, Ottawa, Canada
- Collaborative effort between Crop Life and PMRA
- Participant-driven program
  - Government
  - Industry
  - Academia

Resistance Management Recommendations from Workshop:

- Enhance definition of roles and responsibilities of stakeholders
- Regional approach
- Increase number of available modes of action
- Monitor to delay the onset of resistance
- Improve awareness of IRM through education
- Ensure users are aware of resistance management strategies

NAFTA Meeting: Ottawa, December 2009

- NAFTA Technical Working Group on Pesticides
- Break-out Group discussion on pesticide resistance: issues and strategies for management
- Resistance management from perspective of regulatory agencies, extension/academia, industry, and growers/users
- What role(s) should each play in resistance management?

Ongoing Challenges

- Potential lack of alternative chemistries for rotation
  - impact of re-evaluation
  - difficulty in finding new chemistries
- Increase in practices that could favour development of resistance
  - short or inappropriate crop rotations
  - below-label application rates
  - pesticide use for non-pesticidal purposes
- Using the easy solution
- Education

Next Steps

- Follow-up on recommendations from Workshop in 2008 and on discussions at NAFTA meeting in December 2009
- Increase awareness of resistance management
- Increase importance of cooperation between growers, industry, researchers, stakeholders, and government