



NAFTA Technical Working Group on Pesticides
Grupo de Trabajo Técnico del TLCAN sobre Plaguicidas
Groupe de travail technique de l'ALENA sur les pesticides

PROJECT COMPLETION SHEET

SUBCOMMITTEE: Risk Reduction

PROJECT TITLE: Implementation of Pesticide Resistance Management Labelling

PROJECT ID: RR03-02-1008

PROJECT LEADS: Canada: Pierre Beauchamp (PMRA)
United States: Sharlene Matten (EPA)

PROJECT DATES: **Initiation:** April 1, 2002
Completion: September 30, 2008

GOAL/OBJECTIVE: To implement and update as needed the guidelines for voluntary pesticide resistance management labelling in North America. Implementation of the guidelines across North America will help reduce the development of pesticide resistance by providing consistency in resistance management labelling for commercially registered product and all products being considered for approval in any or all of the NAFTA countries.

BACKGROUND:

PROJECT DESCRIPTION

The purpose of this project was to develop a procedure to update Health Canada's Pest Management Regulatory Agency (PMRA) and the United States Environmental Protection Agency (EPA) guidelines for pesticide resistance management as needed. The procedure will provide a process to add new active ingredients registered for use in North America to the modes of action groups tables published in the guideline by the registering country or countries. In addition, PMRA and EPA will establish a process to incorporate the voluntary resistance management labelling statements and mode of action symbol on all labels of commercially registered pesticides in order to be available to the users and other interested groups.

BACKGROUND/RATIONALE

The management of pesticide resistance development is an important part of sustainable pest management and this, in conjunction with alternative pest management strategies and integrated pest management programs, can make significant contributions to reducing risks to humans and the environment. In support of this goal, guidelines on resistance management labelling were published in October 1999 (PMRA DIR 99-06) and June

2001 (EPA PR Notice 2001-5).

The goal of these guidelines is to prevent the loss of pesticides effectiveness due to the development of resistance by pests. When pesticides resistance occurs, users may increase rates and frequency of application in an attempt to maintain effectiveness of the products; this approach can lead to the complete loss of effectiveness of the product and increased exposure to the pesticide. Integrated pest management systems use all available techniques to control pests in an economically and environmentally sound manner and these systems can be compromised by a reduction in the availability of tools or by the use of higher rates that could adversely impact non-target organisms. By rotating pesticides with different modes of action, and limiting the total number of application of pesticides from a given group, it is hoped to manage the development of resistance without resorting to increased rates and frequency of application and to prolong the useful life of pesticides.

In order to be effective, the guidelines must be kept current to ensure that they provide up-to-date information on new active ingredients and mode of action groups. Equally important, this information must be incorporated on all labels of commercially registered pesticides in order to be available to the users and other interested groups.

A North American process is needed to ensure:

- timely and consistent updating of PMRA and EPA guidelines; and
- incorporation of consistent resistance management statements into the labels of commercial products.

OUTPUT/RESULTS:

The resistance management mode of action symbol and resistance management labelling statements have been widely adopted by growers, industry, government, and academia. The key outputs of this voluntary resistance management labelling effort to date (2001 to present) are listed below.

- 1. CSREES/USDA/EPA Pesticide Safety Education Program Resistance Education Module**
- 2. National Potato Council Brochures:**
 - a. A Grower Approach to Neonicotinoid Resistance Management for Colorado Potato Beetle and Green Potato Aphid in Potatoes
 - b. A Practical Approach to Resistance Management for Weeds in Potato Cropping Systems
 - c. A Practical Approach to Resistance Management for Potato Diseases
- 3. National Corn Growers Association and National Cotton Council:** The Weed Resistance Management Learning Center (Continuing Education Credits received)
- 4. Adoption of specific resistance management resolution for adoption of pesticide mode of action on a product's label (e.g., Southern Weed Science Society):**

“The Herbicide Resistant Weeds Committee of the Southern Weed Science Society supports the principle of voluntary identification by registrants of the herbicide's mode of action on the product's label.”
- 5. Insecticide Resistance Action Committee (Industry Technical Working Group):**
 - a. Neonicotinoid Resistance Management Guidelines
 - b. Mode of Action Education Pamphlet, Poster (+ other resistance management education programs)
 - c. Annual updates to MOA posted on website
- 6. Herbicide Resistance Action Committee (Industry Technical Working Group):**
 - a. Guidelines for Herbicide Resistance

- b. Mode of Action Poster
 - c. Annual updates to MOA posted on website
- 7. Fungicide Resistance Action Committee (Industry Technical Working Group):**
- a. North American Quinone Outside Inhibitor Working Group for QoI Fungicides in North America
 - b. Annual updates to MOA posted on website
- 8. APS Net: Plant Pathogen Resistance Management**
- 9. State (U.S.) IPM Program Coordinators adoption of RM MOA classifications in their grower education materials and programs**
- 10. USEPA Accomplishments:**
- a. Office of Pesticide Programs FIFRA Labeling Review Manual (Chapter 11): Resistance Management Labeling Considerations
 - b. Voluntary RM labeling (Pesticide Registration Notice 2001-5) updates of MOA classification: EPA website links to HRAC, FRAC, and IRAC MOA classifications that are updated annually
 - c. Adoption on labels in the U.S.: A specific percentage of labels cannot be determined. The best examples of adoption in the U.S. are when pesticide registrants work together to promote resistance management (including MOA symbol and resistance management labeling statements) for specific chemical classes (or specific pesticides) in which resistance has become (or is expected to be) a problem that will reduce the benefits of newer chemistries that pose lower risk to human health and the environment, e.g., QoI inhibitors (fungicide), neonicotinoids (insecticide), glyphosate (herbicide). Adoption of resistance management labeling by pesticide registrants include (but is not limited to): Syngenta, Dow, Bayer CropScience, DuPont, Aventis, FMC, and BASF and more recently, Monsanto with its glyphosate labels.
 - d. **Presentations regarding resistance management labeling to:** Entomological Society of America, American Phytopathological Society, Weed Science Society of America, Northeastern Weed Science Society, Southern Weed Science Society, National Alliance of Independent Crop Consultant, Insecticide Resistance Action Committee, Fungicide Resistance Action Committee, Herbicide Resistance Action Committee, National Cotton Council, Crop Life America, Council for Agricultural Science and Technology (CAST) Workshop on Resistance Management, American Association of Pest Control Officials, Chemical Producers and Distributors Association, The State FIFRA Issues Research and Evaluation Group, North Central Regional Pesticide Education and Certification Workshop, USDA Western Regional Coordinating Committee
- 11. PMRA Accomplishments:**
- a. Operationalised inclusion of consistent resistance management label statements into the label of commercial products by PMRA. Eighty percent (80%) of agricultural chemicals now have resistance management statements.
 - b. Consideration of resistance management strategies when evaluating new uses and integration into label use directions.
 - c. Consideration of resistance management strategies in provincial recommendation publications.
 - d. Workshop on resistance management in February 2008 to discuss current resistance management strategies and how to implement an integrated approach to resistance management between provincial and federal governments, industry and growers.
- 12. Publications by S. Matten (USEPA Lead) and P. Beauchamp (PMRA Lead):**
- a. Matten, S.R. 2003. U.S. EPA's voluntary labeling guidelines for pesticide resistance management

- based on rotation of mode of action. Pesticide Outlook. June 2003. Pp. 111-113.
- b. Matten, S.R. 2003. CAST- Pesticide Resistance Management Symposium Captures Stakeholders Interest. Pesticide Outlook. June 2003. P. 114.
 - c. Matten, S.R. 2003. CAST Pesticide Resistance Management Symposium Provides Cross-Disciplinary Dialogue. Resistant Pest Management Newsletter Vol 12: 2.
 - d. Matten, S.R. 2004. Working together to remove resistance management barriers and to adopt proactive resistance management strategies: A U.S. Perspective. In: "Management of Pest Resistance: Strategies Using Crop Management, Biotechnology, and Pesticides" Special Publication No. 24. Council of Agricultural Science and Technology. Ames, IA. P. 141.
 - e. Matten, S.R. and P. Beauchamp. 2004. The Environmental Protection Agency and the Pest Management Regulatory Agency: Pest Resistance Management Goals and Challenges. In: "Management of Pest Resistance: Strategies Using Crop Management, Biotechnology, and Pesticides" Special Publication No. 24. Council of Agricultural Science and Technology. Ames, IA. Pp. 102-106.
 - f. Thompson, G.D., S. Matten , I. Denholm, M.E. Whalon, and P. Leonard. 2008. The politics of resistance management: working towards pesticide resistance management globally. Pp. 146-165. In: Global Pesticide Resistance in Arthropods. Eds. M.E. Whalon, D. Mota-Sanchez and R.M. Hollingworth. CAB International 2008. U.K.

Table 1. Project Implementation Timeline with Milestones

GOAL	ACTIVITIES	TIMEFRAME
The PMRA and EPA to agree on a common procedure for update and implementation.	Meeting to discuss the procedure and update	March 27, 2002 Completed
	Circulate draft procedure to both agencies for comments	September 2002 Completed
Complete update of respective mode of action tables on the Web.	Establish contacts and a consultation process with the various industry resistance management groups (HRAC, IRAC, FRAC)	June 2002 Completed
	Finalize 1 st update of the mode of action tables in collaboration with IRAC, HRAC, and FRAC and standardize the various lists.	October 2004 (PMRA) Completed January 2006 (EPA)
	Finalize 2 nd and subsequent update tables on respective websites	Completed 1 st update November 2005 (EPA) Established links from PR Notice 2001-5 to HRAC, IRAC, and FRAC websites with annual MOA classification updates November 2005 (EPA) Completed 2 nd update July 2007 (EPA) June 2008 (PMRA) Future updates - Ongoing (EPA and PMRA)
	PMRA/EPA to send Mexico CICOPLAFEST a copy of the 1 st update for information/comments	January 2004 Completed
Training	Finalize working procedure and make presentation to respective agencies personnel who will be involved in their application	June 1, 2002 (PMRA) Completed Ongoing (EPA)