

## **Pesticides with Reduced Risk Characteristics**

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During the past decade a reduced risk pesticide registration program has been in operation in the United States (Racke, 1992). The general principle of the reduced risk pesticide registration program in the U.S. is to give registration priority and accelerated approval to products with the most favorable characteristics as compared to currently available alternatives (EPA, 1997). The overall objective is to accelerate the introduction of these types of products so that marketplace choices rather than increased regulatory restrictions can lead to replacement of older products and technologies with newer ones. Under the program, pesticides classified as "reduced risk" products must meet several or all of the following criteria as compared with currently available alternatives:

- Reduced risks to human health
- Reduced risks to non-target organisms (e.g., fish, birds)
- Reduced potential for contamination of environmental resources (water, air, soil)
- Broadened adoption of integrated pest management

With the current system in place, a manufacturer assembles a detailed justification for classification of a new active ingredient (or new use for an existing active ingredient) which must accompany the application for registration. This document makes explicit comparisons between the new pesticide and those products currently in use for the same pests and/or crops with respect to human safety, environmental impacts, and pest management practices. Soon after submission to the U.S. Environmental Protection Agency (EPA), a Reduced Risk Committee thoroughly evaluates the proposal and reaches a decision as to classification of the new pesticide or use as a reduced risk priority. For those few situations in which the reduced criteria are convincingly met, the product is given a high priority for registration review and advanced toward accelerated approval.

Since 1994, a total of 34 such reduced risk pesticides have been approved in the U.S. within shortened regulatory review periods of 14 to 22 months versus the traditional 24 to 38 months or longer. This includes 12 insecticides, 10 herbicides, and 12 fungicides (see Table 1). The reduced risk program has been supported by both industry and environmental organizations. Industry discovery R&D programs have grown more highly attuned to the early market entry benefits of selecting those products for development and commercialization which compare favorably from a registration perspective with those products already available. From a government regulatory standpoint the reduced risk program offers a more proactive, positive approach to pesticide regulation than traditional initiatives which tend to focus inordinate levels of resources on the reevaluation and restriction of older products.

The success of this program in accelerating the introduction of new products with highly favorable characteristics into the marketplace serves as an attractive model for other national/regional regulatory authorities and international advisory bodies to consider. A fast-track process for reduced risk pesticides has now been adopted by the pesticide coordination program of the North American Free Trade Act (NAFTA) countries (Canada, Mexico, U.S.) and incorporated into recently promulgated pesticide registration process legislation in Brazil. The Codex Committee on Pesticide Residues is also considering reduced risk pesticide classification as one of several criteria for prioritization of technical evaluations with the FAO/WHO Joint Meeting on Pesticide Residues (JMPR).

### **Literature Cited**

- EPA. 1997. "Guidelines for Expedited Review of Conventional Pesticides Under the Reduced-Risk Initiative and for Biological Pesticides." U.S. Environmental Protection Agency, PR Notice 97-3.
- Racke, K.D. 2002. "Development and Registration of Pesticides with Reduced Risk Characteristics." In: Voss, G.; Ramos, G. (eds) *Chemistry of Crop Protection*, Wiley, Weinheim, Chapter 24, 322-333.

**Table 1. New Chemicals Registered as Reduced Risk Pesticides by U.S. EPA**

<b>Year</b>	<b>Product</b>	<b>Type</b>	<b>First Registered Uses</b>
1994	Hexaflumuron	Insecticide	Termite control
1995	Flumiclorac-pentyl	Herbicide	Corn, soybeans
1995	Hymexazol	Fungicide	Seed treatment
1995	Tebufenozide	Insecticide	Walnuts
1996	Fludioxonil	Fungicide	Corn seed treatment
1996	Cadre	Herbicide	Peanuts
1996	Mefenoxim	Fungicide	Fruits, nuts
1997	$\alpha$ -Metolachlor	Herbicide	Row crops
1997	Azoxystrobin	Fungicide	Turfgrass, fruits, vegetables
1997	Imazamox	Herbicide	Soybeans
1997	Spinosad	Insecticide	Cotton, turfgrass
1998	Carfentrazone-ethyl	Herbicide	Corn, soybeans, wheat
1998	Cyprodinil	Fungicide	Stone fruits, nuts
1999	Bifenazate	Insecticide	Ornamentals
1999	Diflufenzopyr	Herbicide	Corn
1999	Pymetrozine	Insecticide	Potatoes, tobacco, ornamentals
1999	s-Dimethenamid	Herbicide	Corn, soybeans, peanuts
1999	Fenhexamid	Fungicide	Grapes, strawberries
1999	Trifloxystrobin	Fungicide	Vegetables, pome fruit, grapes
2000	Methoxyfenozide	Insecticide	Cotton, pome fruit
2000	Indoxacarb	Insecticide	Vegetables, pome fruit, sweet corn
2000	Flucarbazone-sodium	Herbicide	Wheat
2000	Fenpyroximate	Insecticide	Ornamentals
2000	Buprofezin	Insecticide	Vegetables
2001	Zoxamide	Fungicide	Grapes, potato, tomato
2001	Fluazinam	Fungicide	Peanuts, potato
2001	Novaluron	Insecticide	Ornamentals
2001	Mesotrione	Herbicide	Corn
2002	Fenamidone	Fungicide	Lettuce, grapes, potato, tomato
2002	Acetamaprid	Insecticide	Cotton, vegetables, pome fruit
2002	Cyhalofop-butyl	Herbicide	Rice
2002	Macalaya extract	Fungicide	Greenhouse ornamentals
2003	Nicobifen	Fungicide	Turfgrass, vegetables, stone fruit
2003	Noviflumuron	Insecticide	Termite control