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# Pest Management Regulatory Agency Federal Pesticide Regulation

Special Committee on Cosmetic Pesticides  
Legislative Assembly  
Province of British Columbia  
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Lindsay Hanson  
Policy, Communication and Regulatory Affairs Directorate  
Health Canada Pest Management Regulatory Agency



Canada <sup>1</sup>

# Purpose

To provide an overview of how pesticides are approved for use in Canada and the science that forms the basis of these decisions.



# Presentation Outline

- Federal legislation for pesticide regulation
- Overview of scientific review process
- Other initiatives to further reduce risk



# What is a pesticide?

- A pesticide directly or indirectly controls, destroys, attracts or repels a pest, or mitigates or prevents an injurious, noxious or troublesome effect.
- Some examples:
  - Herbicides, insecticides, fungicides used in conventional and organic agriculture
  - Swimming pool chemicals
  - Rodenticides
  - Flea and tick products for pets
  - Insect repellents
  - Biopesticides



# Health Canada's Pest Management Regulatory Agency

## Health Canada's priority:

- Maintain and improve the health & safety of Canadians
  - Pesticides: food crop uses, as well as non-food use exposure scenarios
- This same priority is applied when approving all pesticides for use in Canada.



# Federal Responsibilities

- Regulate all pest control products imported into, sold or used in Canada under the *Pest Control Products Act*
- Pre-market review (stringent science-based evaluation)
- Post-registration oversight
  - Compliance activities
  - Monitoring and surveillance
  - Incident reporting
  - Sales data reporting
- Re-evaluation (scientific re-assessment - 15 year cycle)



# Legislative Authority

- *Pest Control Products Act & Regulations (2006)*
- Primary objective under the *Pest Control Products Act* is to “prevent *unacceptable risks* to people and the environment from the use of pest control products”.
- Enable users access to pest management tools:
  - *pest control products*
  - *sustainable pest management strategies*





# ***Pest Control Products Act - 2006***

Health Canada's new *PCPA* came into force June 28, 2006

## **Fundamental changes in *PCPA* 2006:**

- Strengthens health and environmental protection
- Current practices are now set in law (e.g., public consultation, take into account sensitive sub-populations, aggregate and cumulative exposures)
- More transparency to the registration system
- Strengthens post-registration controls on pesticides (e.g., mandatory incident reporting, re-evaluation, increased fines, etc.)





# What is the Distribution of Legislative Responsibilities?

## Federal

- New Pesticide Registration & Re-evaluation
- Science-based Health, Value Environment Assessments
- Compliance and Enforcement
- Sustainable Strategies
  - **Food crop production**
  - **Non-food uses**

## Provincial

- Transportation, sale, use, storage and disposal
- Training, Certification, Licensing
- Further conditions on use & in accordance with Federal standards

## Municipal

- Bylaws for further conditions on use where authority exists & in accordance with Federal standards



# Human Health Risk Assessment

**Hazard (toxicity) & exposure must be integrated to understand risk**

- Most substances have the potential to cause an adverse effect at high enough doses, but there is usually a lower dose where no harmful effect will occur
- Generally, as the amount of exposure increases, so does the risk of a toxic effect
- Health risk assessment puts a strong emphasis on determining both the amount and duration of people's exposures, including sensitive populations



# What is “Acceptable” Risk?

Acceptable risk: Reasonable certainty of no harm

- to health, future generations and environment
- from use or exposure
- when used according to label directions

[As defined in *PCPA* s. 2(2)]



# Scientific Studies

\* Require > 200 scientific studies to register a new pesticide

## Health Assessment

- Toxicology (Hazard) and epidemiology information
- Occupational & bystander exposure
- Dietary exposure

## Environmental Assessment

- Environmental toxicology
- Environmental chemistry and fate

## Value Assessment

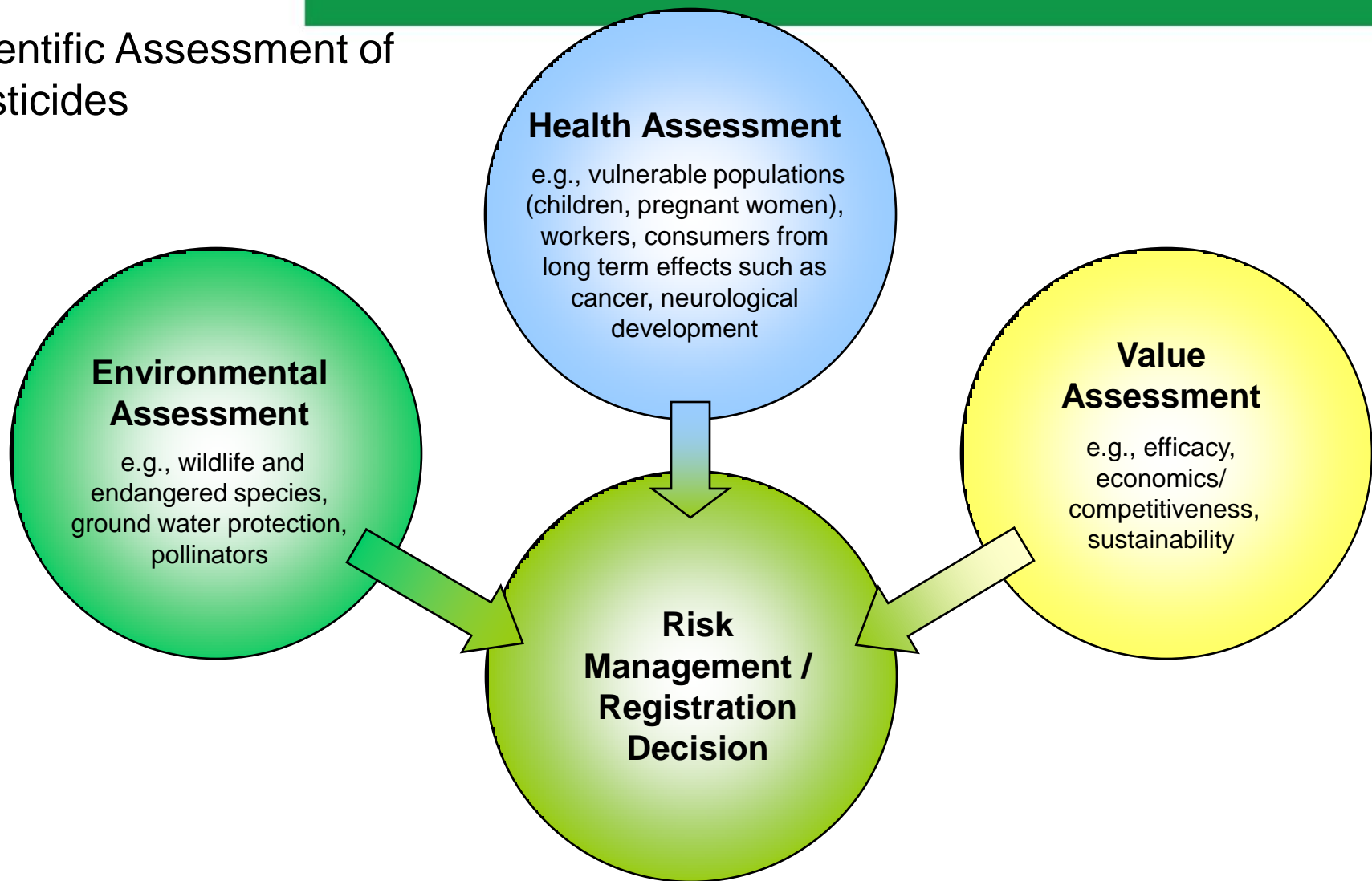
- Efficacy
- Competitiveness
- Sustainability



# Data Submission for a Single Pesticide



# Scientific Assessment of Pesticides





# Where do Studies Come From?

- Onus is on the applicant to submit all required studies (>200 studies for standard food crop use)
- Individual studies within a submission are often conducted by different independent laboratories
- Studies must follow internationally developed and validated test guidelines for study protocols that adhere to the principles of “Good Laboratory Practice”.
- Extensive data reporting allows Health Canada scientists to conduct independent analyses of the raw data
- Published scientific literature – typically post-registration





# Scientific Approach

## HAZARD

- What are the hazards and at what doses? (Toxicity profile)
  - What is the dose where there are no effects?
- Apply uncertainty factors ( $\geq 100x$ )
- **Establish acceptable level of human exposure.**

## EXPOSURE

- What activities create exposure?
- By what route(s) does exposure occur (diet? skin? inhalation?)
- **How much exposure – quantify the amount.**

**What is the risk? (Compare exposure to acceptable level)**

Are the risks acceptable?

**Approve only those uses that meet HC standards**



# What types of Hazards do we look for?

- Acute effects – from a single, high dose (oral, dermal, inhalation, eye and skin irritation and allergic reactions)
- Short-term exposures (2 weeks - 3 months)
- Reproductive effects over 2 generations
- Birth defects
- Neurotoxicity
- Long-term (lifetime) exposure
- Cancer potential over lifetime, including genotoxic potential

Examine available **epidemiology information** in conjunction with toxicity findings



# Why Animal Toxicity Studies?

- A range of doses are tested to cause toxic effects in order to understand what levels are non-toxic
- Allows us to compare effects across different mammalian species for consistency and to identify which species are most sensitive
- Non-toxic level in the most sensitive species is the basis of setting acceptable level for human exposure
- The acceptable level of exposure is at least 100X lower than the non-toxic dose



# How do we Assess Cancer Potential?

- Cancer studies – 2 mammalian species: Daily exposure over a lifetime
- Cancer studies examine all organ systems, clinical chemistry - blood and urinary testing, tissue pathology, clinical symptoms
- Series of *in vivo* & *in vitro* mutagenic tests – examine for DNA effects
- Check for pre-cancerous lesions in other animal studies
- Examine available metabolic and mechanistic studies to better understand how a chemical behaves in the body and causes its effect
- Check for similarities with other known chemicals
- Epidemiology studies



# How do we Measure Exposure?

## Dietary Exposure:

- Specific studies show how much pesticide residue may be present:
  - Treated crops
  - Drinking water
  - Transferred to meat, milk, eggs

## Non-Dietary Exposure:

- Specific studies measure how much pesticide residue can be transferred to people, including children, when they do certain activities
  - Farmers in their fields
  - Homeowners using a product
  - Children playing on treated grass



# Exposure Levels and Risk

- Health Canada determines the amount Canadians may be exposed to through diet and other activities
- These potential exposure levels are determined for various sensitive populations and age groups, including infants, toddlers, children, adolescents and adults
- Potential exposure is overestimated for protection
- Health Canada registers only those uses where human exposures are well below a level that is non-toxic - at least 100X lower



# Summary of Scientific Approach

- Large number of in-house qualified scientists with a wide range of expertise (~ 350 scientists)
- Strong reliance on a comprehensive body of scientific evidence and scientific methods that examine both hazard and exposure
- Consistent with approach of international regulatory bodies
- Science is the basis of all HC regulatory decisions for pesticides
- Approach is precautionary





# What About Older Products on the Market?

## Pesticide Re-evaluation Program:

- To ensure that pesticides meet modern standards for protection of health and the environment, pesticide decisions are re-evaluated on a cyclical basis. Over 90% of all registered pesticides have undergone a full, modern assessment in the last 15 years.
- Compliance with the *Pest Control Products Act* is monitored through a program of inspections and investigations with a variety of enforcement options available to compliance officers



# Other Programs / Approaches

- Registration programs for:
  - Biopesticides
  - Non-conventional products
  - Many programs involve international collaboration & sharing of scientific expertise
- Establish lowest effective rate to keep usage to the minimum amount necessary
- Label improvement programs to update mitigation measures
- Compliance activities promote best practices
- Mandatory incident reporting program will help identify areas that require follow-up



# Summary

- Pesticides are among the most rigorously tested substances in the world. Health Canada's scientific review process ensures that pesticides approved for use in Canada can be used safely when label directions are followed.
- Health Canada is actively involved in various initiatives to provide Canadians with access to newer and lower risk pesticides.
- All pesticides registered in Canada for agricultural, forestry, structural and lawn and garden uses must all meet the same stringent health and safety standards.
- Health Canada approves only those pesticides that show no increase to health risk, including cancer.



# Reminders

- Use pesticides judiciously and only for their intended use.
- Carefully follow label directions, and take measures to become better informed about their safe and effective use.
- To prevent accidents, always store pesticides safely in original clearly marked containers and out of the reach of children.
- If you have a pest problem, please take measures to become better informed about various control options, including pest prevention.



# Health Canada Pest Management Regulatory Agency Contact Information

Phone: 1-800-267-6315

Email: [pmra\\_infoserv@hc-sc.gc.ca](mailto:pmra_infoserv@hc-sc.gc.ca)

Web site:  
[www.hc-sc.gc.ca/cps-spc/pest/index-eng.php](http://www.hc-sc.gc.ca/cps-spc/pest/index-eng.php)



- Questions?
- Comments

