Pesticides

Battle on the front lawn

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Conflict of interest statement:
I am salaried through BC public dollars to protect the health and wellbeing of children and residents in Interior region of BC

Preview of the Issues

- Health impacts
  - Pesticide Management Regulatory Agency (PMRA) reviews
  - Synthesis documents
- Environmental monitoring
- Precautionary and substitution principles
- Public Perception
- Evaluation of current interventions

Synthesis documents that impact Canadian policy

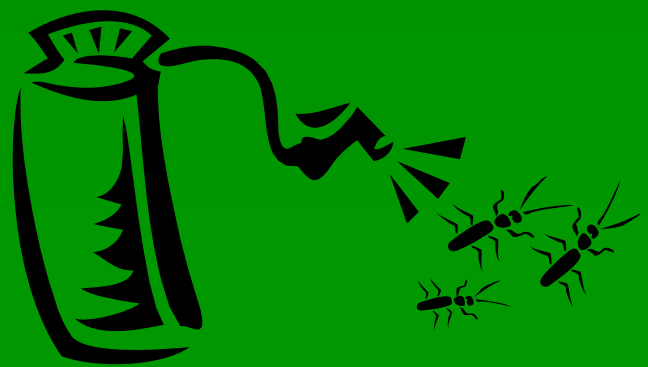
- **Toronto Public Health review of lawn and garden pesticides April 2002**
- **Ontario College of Family Physicians Pesticides Literature Review: April 23, 2004.**
- **PMRA re-evaluation of 2-4D for lawn and turf, February 2005**
- **The Impact of By-Laws and Public Education Programs on Reducing the Cosmetic / Non-Essential, Residential Use of Pesticides: A Best Practices Review**

Caution: Striving to find the balance

- Bias affects the views of the literature and authors. All the documents considered demonstrate some degree of bias.

Health Impacts

- Pesticides are toxic agents. They are designed specifically to interfere with normal physiology and growth functions.
- Pesticides are harmful to humans
  - BUT most any substance is harmful, it is a matter of “DOSE” and “EXPOSURE”



Health Impacts

- Pesticides are a heterogeneous range of products.
  - Each product must be assessed separately.
- In Canada the role is undertaken by Pesticide Management Regulatory Agency (PMRA)
  - http://www.pmra-arla.gc.ca/

PMRA – how credible?

- Controversial history
- Allegations of poor risk assessments based on occupational uses and failing to address children and reproductive outcomes
- Pesticide industry influence
- Government research practices support joint industry activity - increasing bias potential of published research.

PMRA review by the Commissioner of the Environment and Sustainable Development – Oct 2003 (Auditor General of Canada)

- 1.1 “Despite substantial improvements in some areas over the last eight years, the federal government is not adequately ensuring that many pesticides used in Canada meet current standards for protecting health and the quality of the environment. The range of weaknesses we identified raises serious questions about the overall management of the health and environmental risks associated with pesticides.”
  http://www.oag-bvg.gc.ca/domino/reports.nsf/html/c20031001ce.html

Health outcomes that might arise

- Carcinogenicity
- Mutagenicity
- Teratogenicity and growth changes
- Modified Reproductive functions
- Neurotoxicity
- Contact reactions (skin, eyes)
- Allergic reactions
- Hypersensitivity

Case study – 2-4 D reassessment. Conclusion of scientific panel Feb 2005

- The Panel concluded that the product could continue to be used.
- The Panel supported the PMRA's request for additional studies to address uncertainties relating to potential reproductive and developmental neurotoxicity.
- The Panel concurred with applying an additional three-fold safety factor to address uncertainties regarding possible increased sensitivity of the young. (the risk assessment identified children 1-6 as having the highest risk of exposure based on exposure modeling)

Case study – 2-4 D reassessment. Conclusion of scientific panel Feb 2005

- The Panel supported applying an additional safety factor to address severe maternal toxicity.
- The Panel agreed with the PMRA's conclusion that the toxicological database does not suggest a carcinogenic risk. However, the Panel was unable to reach a conclusion on the classification of human carcinogenicity of 2,4-D.
- There were some points of disagreement amongst the panel including the critical final point for the No Observed Adverse Effect Level (NOEL) – this would affect final recommendations

On the other hand, the panel also said

- The Panel indicated that childhood cancer issues should receive greater attention.
- PMRA response
  - “The PMRA maintains that a discussion of this issue is beyond the scope of this document.”
  - “Few studies address children’s health effects from exposure to pesticides, and there are even fewer studies that address childhood cancer from exposure to specific pesticides.”

Not considered in the risk assessments

- Allergic responses other than skin based
- Chemical hypersensitivity syndromes
- Multiple concurrent exposures – ie impact of co-mixed pesticides.

Allergy and Chemical hypersensitivity

- Poorly researched in relation to acute or chronic exposures and impacts.
- Usual approach, sensitive individuals have the right to be warned and can choose to reduce their exposure.
- Assumption that affected persons are aware of their sensitivity.

Environmental Monitoring

- “Hits” now common in surface water, drinking water, some well water and occasionally rain.
- Stormwater outflows high concentrations
- The most common hits
  - 2-4 D, mecoprop, and dicamba
    - then diazanon and MCPA

Precautionary principle

- It recognizes that the absence of full scientific certainty shall not be used as a reason to postpone decisions when faced with the threat of serious or irreversible harm http://www.ec.gc.ca/econom/pp_e.htm
- 1992 Rio Declaration on Environment and Development": "*In order to protect the environment, the precautionary approach shall be widely applied by States according to their capability. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."*

Precautionary Principle in practice (Environment Canada)

General principles of application suggest distinguishing features of decision making within the context of a precautionary approach.

- 1. The precautionary approach is a legitimate and distinctive decision-making tool within risk management.
- 2. It is legitimate for decisions to be guided by society's chosen level of protection against risk.
- 3. Sound scientific information and its evaluation must be the basis for applying the precautionary approach, particularly with regard to (i) the decision to act or not to act (i.e., to implement precautionary measures or not), and (ii) the measures taken once a decision is made.
- 4. The scientific evidence required should be established relative to the chosen level of protection. Further, the responsibility for producing the information base (burden of proof) may be assigned. It is recognized that the scientific information base and responsibility for producing it may shift as the knowledge evolves.
- 5. Mechanisms should exist for reevaluating the basis for the decisions and for providing a transparent process for further consultation.
- 6. A greater degree of transparency, clearer accountability and increased public involvement are appropriate.

Precautionary Principle in practice (Environment Canada)

Principles for precautionary measures propose specific characteristics that apply once a decision to implement such measures has been taken.

- 7. Precautionary measures should be subject to reconsideration, on the basis of the evolution of science, technology and society's chosen level of protection.
- 8. Precautionary measures should be proportional to the potential severity of the risk being addressed and to society's chosen level of protection.
- 9. Precautionary measures should be non-discriminatory and consistent with measures taken in similar circumstances.
- 10. Precautionary measures should be cost-effective, with the goal of generating (i) an overall net benefit for society at least cost, and (ii) efficiency in the choice of measures.
- 11. Where more than one option reasonably meets the above characteristics, then the least trade-restrictive measure should be applied.

Substitution Principle

- Sweden (1973) and European Union(1998) policy direction
- the replacement or reduction of hazardous substances in products and processes by less hazardous or non-hazardous substances, whilst achieving an equivalent functionality via technological or organisational measures.
- Where a less hazardous option exists, it will replace the more hazardous one.

Public Perception

- Google search on “Pesticides and Health” using Canadian limitor
  - 917,000 hits
- More restrictive search:
  - 15,900 hits
- Many of the initial sites are highly biased and support strong limitations.

Public Perception surveys

- *Pesticide Use/Concerns Poll* - City of Waterloo (http://www.pestinfo.ca/documents/B.Detzler.ppt)
- *A Survey of Toronto Residents' Awareness, Uses and Attitudes Towards Lawn Pesticides* - Toronto Public Health, April 2002 http://www.pestinfo.ca/documents/toronto-pesticides_survey.pdf
- *2002 Pesticide Use and Attitude Survey* - City of Ottawa, May 2002 http://www.pestinfo.ca/documents/OttawaSurvey.doc
- *Cosmetic Pesticides in Edmonton & Peterborough: Report* - Canadian Association of Physicians for the Environment, September 2004 http://www.pestinfo.ca/documents/PesticidePoll_Sept04.pdf

Evaulation of Toronto By_Law http://www.toronto.ca/health/boh_pastreports/022607_boh_pastreports.htm#1671

Summary on public perception surveys

- Mixed feelings
  - majority are concerned about health effects
  - majority believe lawns should look good
  - more support than opposition for restrictions on utilization

Effectiveness of interventions

- Best practices review
  - **“Only those communities that passed a by- law and supported it with education or made a community agreement were successful in reducing the use of pesticides by a high degree (51-90%). Education and outreach programs alone, while more popular than bylaws, are far less effective. We could find none that have achieved more than a low reduction (10-24%) in pesticide use to date”.**

Effectiveness of interventions

- Toronto Public Health 3 year evaluation report to Board of Health in February 2007.
  - 35% fewer homes using pesticides (without fines in place)
  - only 25% reporting they still used pesticides
  - Compliance good, complaints on inappropriate application reduced
  - Lawn care and landscaping companies grew 30% from 2001 to 2005

Conclusions

- General trend to activities to reduce pesticide utilization
- Shortcoming persists in scientific reviews
- Allergy and “chemical hypersensitivity” not considered
- Precautionary principle application is challenging in areas of uncertainty. Substitution principle, while not adopted in Canada, has merit in policy development
- Public perception supports reduced pesticide use but also supports good looking lawns
- Evaluation of effectiveness of regulatory and education interventions supports action