



## PESTICIDES & ASTHMA

Causes of asthma are complex and include factors related to early life environmental exposures such as pesticides. Pesticides are chemicals commonly used to kill or control pests (including weeds, insects and fungi). Compared to late-in-life exposures, exposures to pesticides early in life can lead to a greater risk of chronic effects that are expressed only after long latency periods have elapsed

According to the Journal of the American Medical Association (JAMA), asthma can be **triggered** by pesticides. Several types of pesticides are known to cause allergic reactions or airway constriction.

### **Economic Burden of Asthma**

It is important to recognize the economic burden of rising asthma rates. Asthma is a chronic lung disease affecting over 2 million Canadians, including 10 to 15 per cent of Canada's children. Between 1994 and 2001, the number of adults with asthma increased by 29 per cent while between 1994 and 1999, the number of children with asthma in Ontario increased 35 per cent. In Canada, asthma is the leading cause of admissions to hospital. Diseases of toxic environmental origin in general make a significant contribution to total health care costs among children in Canada. The same level of concern is felt in the United States. The Los Angeles Times reported on December 12, 2003 that a study group of children exposed to household pesticides in their first year of life developed asthma twice as often as those never exposed.

Asthma is the most common chronic illness in children. Numerous scientific studies have linked asthma to pesticide use. Studies also show that some commonly used lawn and indoor pesticides are asthma triggers. Moreover, children who are regularly exposed to pesticides are more likely to suffer from infectious diseases of the respiratory tract because of an increased risk of immune suppression. Research studies have found that exposure to organophosphate pesticides disrupts the part of the nervous system that regulates the motor functioning of the lungs. This has led researchers to hypothesize that pesticides are among the preventable causes of asthma in children.

### **How are people exposed to pesticides which might result in allergic symptoms?**

Pesticides may be inhaled, ingested or absorbed and may be encountered as residues in food, air and water. People may also be exposed to pesticides used in agriculture, applications for pest control at home or at work, applications to roadside right-of-ways to control weeds and applications of pesticides for public health vector control programs. A specific pesticide exposure which might cause an allergic reaction in a susceptible individual can be 1,000 times less than an



exposure which would cause a toxic reaction. For example, exposure to some pesticides can trigger an asthma attack at a trivial dose of exposure.

While some pesticides are used to protect our food supply or prevent disease, others known as “cosmetic”, “ornamental” or “non-essential” are used to keep lawns and gardens free from weeds and insects. This type of outdoor pesticide usage is of concern as are certain types of pesticides used indoors for the elimination of specific pests.

No pesticide is used without risk to human health; chemicals that are designed to kill insects and rodents present potential harm to humans. Pesticide exposure has been linked to a number of chronic health problems, including cancer, birth defects, endocrine disruption, asthma, neurological disorders, and immune system.

In general, rates of application of agrochemicals\* including herbicides, insecticides, fungicides used on our lawns are much higher than those used in forestry and higher than most usage in agriculture.

Unlike agriculture and forestry applications, the probability of urban exposure to pesticide use, particularly on residential lawns, commercial properties and golf courses is much higher and the benefits are strictly cosmetic.

Lawns that are weedy or less vibrant green, do not threaten the environment, but lawns treated with pesticides have the greatest impact on infants and children.

Children are particularly vulnerable to the effects of pesticides, especially those with a history of allergies or asthma. Children are more susceptible to harm from pesticides than adults and are more likely to absorb higher doses of these chemicals than adults, for a number of reasons. When pesticide spray drifts over play areas, young children are exposed to the chemical by inhalation and because they put their hands and their toys into their mouths so often the chemicals can be both ingested and absorbed through the skin. Young children’s close proximity to the ground, their reduced ability to detoxify substances and increased sensitivity to pesticides making them more likely to be adversely affected by pesticides. This is further compounded by their inability to read signs and the likelihood that they will play or roll around on the treated areas granting them increased exposure.

### **Are children's special characteristics taken into account when pesticides are evaluated for their risk to health?**

Health Canada’s new Pest Control Products Act (2002) received Royal Assent on December 12, 2002. PMRA (Pest Management Regulatory Agency) conducts a thorough assessment of pesticides before their use is permitted in Canada. These assessments are carried out in order to ensure that pesticides do not pose a health risk to Canadians. They incorporate a special focus on sensitive sub-populations, including children.



The PMRA knows that children's diets are different and that their activities vary from those of adults. The Agency takes children's potential to be exposed to pesticides through food and non-food routes into account in its health assessments. Scientists at the PMRA also factor in the differences in children's development and metabolism when toxicology tests are assessed.

The Agency will consider registration of a pesticide for food uses **ONLY** when child-specific assessments are found to be acceptable.

Public concern over the potential hazards associated with chemical lawn care products and services has been on a steady rise. Alarming, suburban lawns and gardens receive far heavier pesticide applications per acre than most other land areas in Canada, including agricultural areas.

Such widespread use and exposure is worrisome considering that of the 36 most commonly used lawn pesticides, 14 are probable or possible carcinogens. Additionally, 15 are linked with birth defects, 21 with reproductive effects, 24 with neurotoxicity, 22 with liver or kidney damage, and 34 are sensitizers and/or irritants.

Synthetic pyrethroid insecticides, widely used by municipalities for adult mosquito control, can be a key contributor to asthma attacks. Exposure to the pyrethroid insecticides, permethrin and sumithrin, can initiate headaches, asthmatic attacks, tremors, and convulsions and can lead to even more serious syndromes with extended exposure.

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Pesticides are of serious concern to adults, as well. There are over 490 products registered in Canada for home and garden use that contain pyrethrins, a group of compounds extracted from a type of daisy. Pyrethrins are absorbed in humans through the respiratory system and may cause severe reactions for people with asthma. For the general public, pesticide use may induce systemic and local reactions, such as irritation of the respiratory tract and asthma-like reactions in some individuals. Foot traffic across lawns and onto rugs is another source of contact. Pesticides accumulate in the thatch layer of lawns where they are picked up on shoes and subsequently carried into residences, and onto carpets. Residues do not break down in the dark dry carpet and are not effectively removed by vacuuming.

Studies have found that adults who work with pesticides have higher rates of respiratory symptoms and disease. For example, a survey conducted in Saskatchewan found that farmers who had asthma were 80% more likely to have used a certain form of pesticide (carbamate) in the previous five years than non-asthmatics.

Other points to consider are that outdoor pets are also adversely affected and runoff water is contaminated.



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## What can we do?

We should take steps to minimize our exposure and risk. Investigate non toxic, low risk possible alternatives.

Buy only domestic class products bearing a PCP registration number. These products are relatively safe and are available in sizes appropriate for use in and around the home. Remember that agricultural, commercial, industrial or restricted class products are intended only for use by commercial or licensed applicators. Use effective alternatives products known to have low toxicity such as pyrethrum, boric acid, diatomaceous earth, *Bacillus thuringiensis*, and insecticidal soaps.

## Indoor Use of Pesticides

Cockroaches are good example of where there are alternatives to using toxins. We know that exposure to cockroaches can cause asthma attacks and may increase a child's risk of developing asthma. Pesticides used to control cockroaches in the home play an important role. But some pesticides used to control cockroaches, such as diazinon or propoxur, can affect the human nervous system. The effect of exposure to small amounts of pesticide over a longer time, such as several years or a lifetime, is not fully understood.

Several things can be done to help control cockroaches indoors:

- Clean up food. Keep food and garbage stored in tight containers. Wash dishes and remove garbage daily. Clean up crumbs and spills promptly.
- Clean floors. Vacuum and wet vacuum your home frequently to remove food crumbs and cockroach eggs.
- Maintain sinks, tubs and appliances. Repair damaged faucets, drains and appliances. Fix cracks in them. Don't let water set for long periods of time. When the food and water supply dries up, the cockroaches may look elsewhere.



## Out Door Use of Pesticides

Scientists have long theorized that exposure to irritants or chemicals could alter a child's developing immune and respiratory systems. Based on recent studies of the widespread use of pesticides and herbicides in the home and farm environments, and the magnitude of the observed risks, giving priority to discontinuing the use of pesticides for cosmetic purposes is warranted.

We need to keep in perspective that the primary purpose for using pesticides on lawns is cosmetic where as the creation of healthy micro-ecosystems is the goal of organic lawn techniques.

Looking at your lawn and garden as mini-ecosystems we note that everything we do has an impact somewhere in the system. When we water, we provide the moisture plants need but when we eliminate bugs, we eliminate food for the birds.

## Tips for Growing Lawns the Organic Way

- Wear spiked shoes (golf shoes work well) to walk on the lawn in spring and fall. This creates small holes that help improve drainage and increase oxygen delivery to the soil.
- Use a de-thatching rake every fall to remove grass that has compacted near the roots of the lawn. This increases air circulation and discourages fungal growth. Spread compost on top of your lawn, after aerating and weeding and prior to seeding.
- Let the grass grow high- cut the lawn to the 3 inch setting of your mower. This provides shade at the root level, discouraging weed growth and keeping the soil cool.
- Water deeply ( 1 inch of water ), preferably in the morning to avoid evaporation. Avoid watering in the evening as it encourages mould growth. Water once per week only and monitor natural rainfall levels
- Overseed. Grass plants die and over-seeding each spring and fall helps keep the weed population down by virtue overcrowding.
- Mulch your lawn using grass clippings. Use a mulching mower or blade. Keep the mulcher blade sharp to avoid tearing or stress on the grass.
- Fertilize using compost, grass clippings (from mulching) or slow release organic products.

## For more information, visit these websites:

- ✓ Health Canada: Responsible Pesticide Use [<http://www.pmr-arla.gc.ca/english/consum/consum-e.html>]
- ✓ Organic Pest Control: [http://www.oakvillegreen.com/html/organic\\_pest\\_control.htm](http://www.oakvillegreen.com/html/organic_pest_control.htm)
- ✓ For more tips on gardening visit: [www.goforgreen.ca/gardening](http://www.goforgreen.ca/gardening) and [www.organiclandscape.org](http://www.organiclandscape.org)