Agriculture & Pesticides Facts

POTENTIAL HEALTH EFFECTS OF AGRICULTURAL PESTICIDES

Because pesticides are designed to kill or otherwise affect the behaviour of some type of living organism, they can also pose a risk to other types of organisms, including humans. Before a pesticide can be used in Canada, it must be approved and registered by the Pest Management Regulatory Agency of Health Canada (PMRA). PMRA is the agency responsible for assessing the acceptability of pesticides for use in Canada and determining acceptable levels for pesticide residues in food. A pesticide will not be approved for use in Canada unless the potential total daily intake of residues of that pesticide, from all foods, is proven to be well below the level that might adversely affect the health of any age group.

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In order to affect a pest, a pesticide must act upon some vital system or chemical process within that organism. The extent to which some other species may be at risk of injury from that pesticide depends, in part, on how similar that species is to the target species. In particular, is the system or process that is affected by the pesticide vital to the survival or health of that organism?

The effects of a pesticide can be either acute - an immediate response to short term exposure to a high dosage - or chronic - a response to long term exposure to a low dosage.

Pesticides vary greatly with respect to their mode of action, the range of organisms they affect, their acute effects, and their chronic effects. Some pesticides can pose a significant risk to human health or to the environment, while others present very little risk at all. Reading the pesticide label is the quickest way to obtain information regarding the relative risk posed by a pesticide.

Pesticides pose the greatest risk to the people who handle or apply them. When applied properly, agricultural pesticides pose a very low risk to people who are not involved directly in their use. The dosage received through casual exposure - such as by walking through a treated field, inhaling vapours from a treated area or eating produce from a treated field - would rarely be sufficient to cause a health problem. However, highly sensitive people might experience an allergic reaction, so caution remains advisable.

ACUTE TOXICITY

Depending on the product, pesticides range from low to very high in acute toxicity to humans. In general, insecticides are the group of pesticides most toxic to humans. Many insecticides attack the nervous system of the target insects and therefore are toxic, to some degree, to other species with a nervous system (i.e., humans and many other members of the animal kingdom). There is, however, considerably variation among insecticides. Some are so highly toxic that a few grams are sufficient to kill a person. Others, such as most of those available for home or garden use, are moderate in toxicity, or about the same as aspirin.

Herbicides account for about 75 percent of the agricultural pesticides used in Ontario. In general, herbicides are low to moderate in toxicity towards humans and animals, because most herbicides target chemical pathways that animals do not possess (e.g., photosynthesis). A few agricultural herbicides are very toxic, so one should always check the safety precautions on the product label before using any pesticide. (No highly toxic herbicide is available for home or garden use.)

CHRONIC HEALTH EFFECTS

Because of the potential hazard, all pesticides being considered for use in Canada must undergo long-term animal testing to assess their potential for affecting human health. Long-term exposure to high dosages of some pesticides has caused chronic health problems in laboratory animals. Potential disorders tested for include cancer, tumors, birth defects, disruption of the endocrine system, genetic mutations and damage to vital organs such as the liver, lungs or kidneys, depending on the pesticide and the animal species. Not all pesticides cause chronic effects, and no pesticide causes all of the above symptoms. Also, where damage has occurred, it has been the result of exposure to much higher dosages than pesticide residues in or on foods would represent. As previously noted, a pesticide will be approved for use only when it can be shown that the potential total daily intake of residues of that pesticide, from all foods, is well below the level that might adversely affect the health of any age group of people.

Health studies suggest that fewer than two percent of human cancers can be attributed to residues of synthetic chemicals in foods. The greatest food-related cancer risks are associated with poor dietary habits (e.g., high fat, low fibre diets), naturally occurring carcinogens in foods, and carcinogens produced during food preparation (through processes such as grilling, frying or barbequing).

INTERNET RESOURCES:

Fact Sheet on the Regulation of Pesticides in Canada
http://www.hc-sc.gc.ca/pmra-arla/english/pdf/fact/fs_pestreg-e.pdf

Fact Sheet on the Pest Management Regulatory Agency
http://www.hc-sc.gc.ca/pmra-arla/english/pdf/fact/fs_pmra-e.pdf

Overview of the Pest Management Regulatory Agency
http://www.hc-sc.gc.ca/pmra-arla/english/pdf/pmra/pmra_overview-e.pdf

Chemical Carcinogens: Health Risks
http://www.hc-sc.gc.ca/ehp/ehd/catalogue/general/iyh/chemcarc.htm
Health Canada