Briefing Note on the Herbicide 2,4-D

Synopsis:

Health Canada's Pest Management Regulatory Agency ("PMRA") has concluded, "the use of 2,4-D and its end-use products to treat lawns and turf does not entail an unacceptable risk of harm to human health or the environment." The evaluations of 2,4-D released by the PMRA in February 2005 and August 2006 are in keeping with similar programs underway in the United States, Europe and elsewhere.

Since being first registered in Canada in 1946, the herbicide 2,4-D has become one of the most widely used agricultural herbicides in this country and worldwide. It is used on many crops such as wheat, barley, corn, rice, pasture, soybeans, potatoes, sugar cane, pome fruits, stone fruits and nuts. It is also a component of herbicides used to protect turf grass from weeds and environmentally sensitive areas from invasive species.

Background:

The debate occurring in Canada centres around the potential risks to human health (specifically cancer risk) of the pesticides used to protect lawns and turf grass from invasive weeds. In this regard, the Proposed Acceptability for Continuing Registration ("PACR") document released by Health Canada states:

> *"… All are in agreement that there is no evidence of carcinogenicity in the animal toxicity studies and that the epidemiology studies show no clear association between exposure to phenoxy herbicides and human cancers. The PMRA is not aware of any new evidence that would challenge these conclusions, and more recent epidemiological analyses lend further support for this classification (De Roos et al. 2003; Alavanja et al 2002, 2004). Because of the inconsistent epidemiological associations, the recognition that there are many other factors that may have contributed to the weakly positive associations and the fact that the animal studies designed to show causality were consistently negative, the PMRA concurs that 2,4-D cannot be classified as to its human carcinogenicity on the basis of all available and relevant data."*

This assessment by Health Canada of the scientific data reinforces an extraordinary number of regulatory decisions and expert panel reviews that conclude the use of 2,4-D, while protecting food production and the environment, does not present a risk to human health. As the attached chart illustrates, since 1987 the expert panels convened by the World Health Organization, European Commission, several well-regarded schools of public health, as well as the PMRA have all determined that the use of 2,4-D does not present a human health risk.

In June 2004 the United States Environmental Protection Agency issued its draft Re-registration Evaluation Decision. As with the release of the PACR by the PMRA, interested parties had an opportunity to review the agency's findings and submit comments. The EPA then issued its response to comments on December 16, 2004. Of particular significance is the following statement by the EPA:

> *"In 1996, HED [Health Effects Division] reviewed additional studies and concluded that they were not sufficient to change the conclusions drawn by the Science Advisory Panel/Scientific Advisory Board. Since the 1996 review, very few new studies have examined the relationship between exposure to 2,4-D and cancer.*

> *Review of the additional studies cited by BP [Beyond Pesticides] (and not previously considered) indicate that the studies add very little to our understanding of the cancer epidemiology specifically related to 2,4-D. HED concludes there is no additional evidence that would implicate 2,4-D as a cause of cancer."*

Reports issued by the PMRA (August 2006) and US EPA (June 2005) reiterate the conclusion that potential risks are "not of concern" and reports cited by certain groups add little to current understanding.

Why are there conflicting reports about 2,4-D?

All registered pesticides must have met exhaustive research standards set by regulatory agencies throughout the world. The scientific data submitted must follow Good Laboratory Practice ("GLP") protocol (see: http://ec.europa.eu/enterprise/chemicals/legislation/glp/whatis_en.htm).

2,4-D, in addition to being one of the most widely used agricultural herbicides worldwide, was the first selective herbicide developed, something which stimulated an enormous amount of research on 2,4-D. While it is not known what the total number of research studies currently is – in 1978 it is reported to be in excess of 40,000 – the toxicology data base alone exceeds 4,000 peer-reviewed, published studies, plus hundreds of unpublished GLP studies which the manufacturers must provide to the various regulatory agencies throughout the world. Additionally, there are now more than 140 peer-reviewed, published epidemiologic (human) studies pertinent to 2,4-D.

Those opposed to the use of 2,4-D typically cite research that is not of GLP quality or reports that consider a small fraction of the available research. Most do not consider the relationship between exposure (actual or potential) and the health outcome. Moreover, they consistently ignore the science-based findings of reputable organizations established to protect human health such as the World Health Organization, EPA and PMRA.

About the herbicide 2,4-D:

The original patent on 2,4-D was issued in 1945 to Dr. Franklin D. Jones, a plant physiologist. Dr. Jones was working with the naturally occurring plant auxin, indole acetic acid (IAA). IAA is present in all plant matter and humans ingest it daily whenever fruit, vegetables and cereals are consumed. In an effort to work with a more chemically stable, auxin-like compound, Dr. Jones included 2,4-D, an analog of IAA, in his experiments.

In 2004, The Henry Ford organization in Dearborn, Michigan identified 2,4-D as one of the 75 most important innovations in the previous 75 years. Few scientific innovations have done as much to increase food production throughout the world.

Reference documents:

Pest Management Regulatory Agency 2,4-D Lawn & Turf Uses PACR (February 2005):
http://www.pmra-arla.gc.ca/english/pdf/pacr/pacr2005-01-e.pdf

Pest Management Regulatory Agency Questions and Answers about 2,4-D (August 2006):
http://www.pmra-arla.gc.ca/english/highlights/QA/rev2,4-D-e.html

United States Environmental Protection Agency Fact Sheet on 2,4-D (June 2005):
http://www.epa.gov/oppsrrd1/REDs/factsheets/24d_fs.htm