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HERBICIDES AND ENVIRONMENTAL PROTECTION:

A LEGAL PERSPECTIVE

An Address to the Symposium
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by

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I. INTRODUCTION

The Canadian Environmental Law Association (CELA), founded in 1970, is a public interest environmental law group. Since 1980, CELA has focused both its casework and law reform efforts in the area of toxic chemicals, hazardous wastes, and pesticides.

In 1982, CELA presented a brief to the federal Consultative Committee on IBT Pesticides during its deliberations on captan and, at that time, made recommendations for reform of Canadian pesticide legislation. Most recently I have co-authored a study for the Law Reform Commission of Canada on Pesticide Law and Policy in Canada.

I have been asked to speak about the current legal framework available for dealing with the protection of health and the environment from damage caused by the use of pesticides. My paper will examine the ability of the common law to deal with pesticide-related damage; the limitations of the present regulatory scheme and conclude with suggested directions for law reform in the area of control of pesticides in Canada.

II. THE NATURE OF THE ENVIRONMENTAL AND HUMAN HEALTH PROBLEMS POSED BY PESTICIDES

While pesticides are accepted as essential and beneficial in agricultural food production, forestry and certain domestic uses, it is clear that pesticides also pose serious environmental and human health threats. The contradiction between

these benefits on the one hand, and environmental health damage on the other has increasingly drawn all levels of government and the public to seek both preventive and remedial solutions to the problem.

Since the 1940's, when synthetic organic pesticides became available there has been a dramatic increase in pesticide sales and use in Canada. For example, in 1975 approximately 10 million acres were treated with herbicides on the Canadian prairies. By 1978 this had increased to at least 15.5 million acres.¹ And between 1975 and 1979, expenditures on pesticides by Canadian farmers increased from \$163 million a year to more than \$350 million, an increase of over 100 per cent.² According to the federal government this indicated a substantial rise in the use of pesticides, principally herbicides.³ Unfortunately due to lack of record-keeping requirements under both federal and provincial legislation, it is difficult to pinpoint exactly what pesticides are used, by whom, how frequently, on how much acreage, where and in what quantities.

As Dr. Morrison, Assistant Deputy Minister, Health and Welfare Canada recently said, "By their very nature, pesticides are going to be poisonous. They have to be toxic in order to kill whatever they're intended to kill".⁴ The public's concerns revolve around this fact, ie. that pesticides are, by design,

meant to be toxic to certain organisms and as such are deliberately applied to the environment. Generally two main categories of undesirable effects resulting from pesticide use have been identified. These are (1) the development of resistance in pest species, and (2) the impact on non-target species and ecosystems. As the United Nations Environment Program (UNEP) noted "even when properly used, chemical pesticides have a number of unavoidable side effects. Their persistence and ubiquitous nature, coupled with a tendency for some compounds to concentrate in organisms as they move up the food chain, may increase their toxicity to fish, birds and other forms of life, including man..."⁵

Recent examples across Canada demonstrate that the human health and environmental problems posed by pesticides are national in scope. For example:

- In New Brunswick, during 1975, at least 3 million birds were killed from aerial spraying of approximately 7 million acres of forest with phosphamidon and fenitrothion to combat the spruce budworm;⁶
- in 1979, in Ontario, following the roadside spraying of the herbicides 2,4-D and 2,4-DP along a ditch to control brush and weeds, 70,000 trout were killed when the chemicals reached a nearby body of water;⁷
- studies in 1980 indicated that fenitrothion has the potential

to contaminate shellfish over a widespread area of the Maritimes. Shellfish in areas as far as 50 kilometres from sprayed areas were found to be contaminated.⁸

III. THE ADEQUACY OF COMMON LAW REMEDIES

The increased use of chemical pesticides since the end of World War II as well as greater public awareness of adverse human and environmental impacts associated with exposure to these chemicals have led many to seek redress in the courts for damage to health and property. There are a number of traditional common law causes of action available to those seeking compensation (damages) or an injunction for pesticide damage. These include the torts of nuisance (both private and public), strict liability, trespass, negligence and even assault and battery. There may also be actions for breach of contract or warranty regarding the fitness for intended purpose of certain pesticides.

An analysis of the reported cases shows that while the common law may provide adequate redress for short term health impacts and damage to property, there are considerable obstacles to obtaining compensation for long term health effects from pesticide exposure. Nowhere was this thesis more clearly demonstrated than in the Nova Scotia herbicide case. Before

turning to a discussion of that case, I will discuss briefly private nuisance, one of the common law actions often used in pesticide cases and its limitations.

(A) Private Nuisance

Private nuisance is defined as an unreasonable interference with an owner's or occupier's use and enjoyment of land. This is the cause of action most often used in cases of pesticide drift, where damages have occurred to health or property. For example, in Newman v. Conair Aviation Ltd.,⁹ a case involving pesticide drift, the Court held that it was no defence to show that the operation of the defendant's farm is a useful one carried on with all care and skill. Negligence does not have to be shown in a claim for nuisance and even a single spray event may constitute nuisance.

The principle defence applies where a defendant can show that he was permitted by statute to act in a way which resulted in the nuisance. The defence only applies when the nuisance is the inevitable result of the authorization, not when it can be avoided.

In Friesen et al. v. Forest Protection Ltd.,¹⁰ a case involving damages caused by the spraying of fenitrothion, the defendant company claimed that its spraying activity was justified by the terms of the New Brunswick Forest Service Act which pro-

vided that the cabinet could enter into agreements with any person to carry out operations for protecting the forests from insects. Notwithstanding an agreement between the Ministry and the company to spray approximately 9.6 million acres in 1976, the court held that the defendant could not rely on the defence of statutory authority as there was no express authority to place spray on private lands to the detriment or private rights of the owner.

Interestingly, in response to the Court's findings of liability in these cases, the New Brunswick legislature in 1978 amended the Forest Service Act to specifically allow aerial spraying of pesticides on private land. In addition, the Act was amended to limit citizens' rights to sue in nuisance and trespass. Specifically an action will lie only where the nuisance or trespass results in actual injury to persons or actual damage to property.¹¹

The final element to be discussed in establishing a private nuisance is causation. Causation refers to the requirement that the plaintiff show on the balance of probabilities that there is a connection or link between the wrongful act and the damage. The usual test is that the plaintiff must prove that without the act of the defendant he would have no damage.

It is here that the tort system begins to break down for cases involving pesticide injury. While most of the decided cases deal with the immediate effects of pesticides; i.e. damage to crops and short term health impacts (e.g. nausea, headaches) it is the long term health implications of pesticide exposure that are difficult to prove.

This is especially the case when one is trying to prove future harm and predict that specific pesticides will have adverse effects on human health or the environment and that for this reason the application should not occur. This was the fact situation in the Nova Scotia herbicide case, where 15 Cape Breton landowners tried to obtain a permanent injunction based on private nuisance and related causes of action to prevent Nova Scotia Forest Industries from spraying certain forest areas in Nova Scotia with the herbicides 2,4-D and 2,4,5-T.¹²

(B) The Nova Scotia Herbicide Case

The landowners had originally tried to mobilize public support against the spraying of these chemicals in the spring of 1982, and were successful politically in getting the spray permits changed from aerial to ground spraying. However, with that shortlived victory came the announcement that spraying was to start within days. At this point, the landowners went to court as a last resort to obtain an injunction against the

spraying. In August, 1982, the plaintiffs were successful in obtaining both an interim and interlocutory injunction preventing the spraying of the pesticides. Highly technical evidence was presented in court relating to the effects of 2,4-D and 2,4,5-T on human health. The bulk of the evidence focused on the contaminant 2,3,7,8-TCDD (dioxin). The defendant company argued that relief should not be given to the plaintiffs as they had not presented evidence of impending harm and had only indicated a remote and problematic possibility of harm.

Mr. Justice Burchell in granting the interlocutory injunction discussed the legal hurdles that were necessary for the plaintiff to overcome in order to obtain the injunction. The tests were that (1) the claim was not frivolous or vexatious, (2) that there was a real question to be tried and (3) that the applicant has some real prospect of succeeding. The court held that having regard for the subject material and the serious nature of the harm anticipated, the claim could not be characterized as frivolous. Again, because of the public concern and controversy out of which the case arose, there was clearly a serious question to be tried.¹³

Where the Court had difficulty was with the question of whether the plaintiffs had a real prospect of succeeding. The Court

stated that the weakness of the plaintiffs' case was that it stood upon a possibility (rather than a certainty) of harm extrapolated from laboratory experiments and uncertain epidemiological data. However, Mr. Justice Burchell held that unless it could be shown that the spraying activity could be conducted without hazards, the plaintiffs should be able to refuse the kind of risk that was to be imposed upon them.

In granting the injunction, the court required the usual undertakings by the plaintiff to guarantee that they would be responsible for all costs and damages claimed by the defendant company, should the decision go against them.

The trial commenced on May 5, 1983 in the Nova Scotia Supreme Court before Mr. Justice Merlin Nunn and concluded at the beginning of June. The key issue was whether the plaintiffs could establish a causal link between the application of the two herbicides and adverse health effects. The difficulty, of course, was that these health effects may not manifest themselves for many decades after the initial exposure to the pesticides. As noted by the Judge, over 40,000 articles have been written about dioxin and its effects, many of which were submitted to the Court. The Court had to grapple with the conflicting scientific opinions that were presented by over 30 expert witnesses.

The plaintiffs based their case on evidence that even a small amount of dioxin can cause cancer and other adverse health effects. Witnesses for the plaintiffs testified that even "at the molecular level", phenoxy herbicides can cause reproductive changes.

The defence witnesses testified that the amount of dioxin proposed for use in the Cape Breton forests was too small to have any impact on human health. The defendant's lawyer argued that the law does not exist to protect plaintiffs from unfounded fears.

The issue of where the onus of proof should lie in cases involving toxic chemicals was argued at trial. The plaintiff's position was that where toxic chemicals are involved the onus should be on the party intending to use the chemical substance to show that it was not harmful. Further, any doubt or uncertainty about the effect of potentially hazardous chemicals must be resolved in favour of safety.

However, Mr. Justice Nunn held that this was not the rule, and that the burden of proof rested on the plaintiffs to prove on the balance of probabilities all issues asserted by them. He found that the plaintiffs did not meet the burden of proof. In dismissing the plaintiffs' action, the Judge

took the further step of awarding costs and allowing the defendant to prove its damages, if any, at a later hearing. The issues of costs was ultimately settled out of court, as the plaintiffs did not appeal.

This case clearly demonstrates the inadequacies of the common law in dealing with cases involving long-term health impacts from past or future exposure to toxic chemicals where there is a long latency period from the time of release, subsequent exposure and the onset of damages to health.

The case also raises important questions about the different approaches to concepts of proof taken by law and science. Scientists tend to be cautious about accepting some new theory or evidence as valid. They prefer to be sure about something before saying it is true or false. When confronted with a great deal of uncertainty, scientists will avoid drawing conclusions and instead will call for additional study and research. This approach is entirely consistent with generations of scientific tradition and training. When the scientist is uncertain, he can avoid the risk of being wrong by deferring judgement, while science tries to find the right answers.

However, the principle function of the legal system is to determine who must bear responsibility for acts which have injured or may injure specific individuals or the general

public. When a court makes a decision toward or away from precautionary action, such as an injunction, it is not making a statement about the absolute truth of the matter. It is making a statement about the likelihood of harm and the potential severity of harm.

It is interesting to note, that in a roundtable held last week by our Research Foundation on the question of science and uncertainty, one question participants were asked to consider was: "can the courts, using the adversarial system, satisfactorily resolve competing scientific claims based on uncertain information?"

Everyone agreed that the answer was no, but then realized that the question was not properly framed, as what the courts must grapple with is how to deal with scientific uncertainty when determining individuals' legal rights and not resolve scientific matters.

Indeed Mr. Nunn himself states that ..."it hardly seems necessary to state that a Court of law is no forum for the determination of matters of science". Yet Mr. Justice Nunn himself made some rather sweeping findings in regard to the validity of animal testing, and the health effects of dioxin.

The question becomes, notwithstanding scientific uncertainty, should the law be reformed to reverse the onus of proof in cases involving toxic chemicals.

A number of environmental, church, and consumer groups have said "yes". Following on the decision in the Nova Scotia case groups, including CELA, held a press conference calling for the following law reforms:

- shifting the onus of proof to the defendant;
- amending court procedures to provide that costs should not be awarded against plaintiffs raising environmental or health issues;
- abolishing the rule that plaintiffs seeking a temporary injunction must agree to pay all the defendant's business losses if they lose the case.¹⁴

More recently the federal Minister of the Environment, Charles Caccia called for a shift in the onus of proof. He stated that:

"Providing for reverse onus in certain circumstances is not a concept that should cause abhorrence. I am suggesting that we take a look at the provisions currently made for burden of proof in environmental cases, and ask ourselves if this is indeed the best system possible. I do not think that is ideal that lawyers can find literally dozens of precedents that will protect me and my property from the menace of sailing cricket balls, soccer balls and baseballs, but nothing that will protect us from the threat of potential contamination from toxic chemicals."¹⁵

He recommended, as other commentators have, that the burden of proof rules for toxic chemicals should be reformed so that when the plaintiff has made a prima facie case that a particular activity is likely to cause or contribute to damage to environmental health, the burden of proof would then shift to the defendant to establish on a balance of probabilities that his activity is not likely to have such an impact. The Michigan Environmental Protection Act has had such a clause since 1970.

Finally Mr. Caccia recommended the enactment of an environmental bill of rights to include a wide variety of law reforms, including a change in the burden of proof.

III. THE EXISTING FEDERAL PESTICIDE REGULATORY REGIME AND ITS ADEQUACY

I would now like to turn to a discussion of the existing scheme for the regulation of pesticides, highlight some of the limitations, and conclude with suggestions for reform.

It is interesting that Mr. Justice Nunn, in the Nova Scotia herbicide case commented that:

"to some extent this case takes on the nature of an appeal from the decision of the regulatory agency and any such approach through the courts ought to be discouraged in its infancy."¹⁶

While I would take issue with this characterization of the case, it ironically points out the fact that presently the public is locked out of the regulatory process for pesticides in Canada, and that, for example, there is no mechanism whereby the public

can formally trigger a review of a pesticide on the basis of new evidence being discovered. The Pest Control Products Act (PCPA) has only been amended once since it was enacted in 1939 and has not kept pace with general directions in opening up regulatory decision-making to the public. While recently the Minister of Agriculture has announced that a consultative process may be put in place, it is unclear what form this might ultimately take and whether it will be only window-dressing to hide the fact that long-overdue substantive reforms are not being made.

Pesticide registration is seen as the heart of the regulatory system in Canada. Generally pesticides must be registered before being sold in Canada. The applicant must provide the Minister of Agriculture with a wide variety of tests in order to prove the "safety, merit and value" of the control product .

A. Federal Decision-Making for Pesticides

Presently, Health and Welfare Canada, Environment Canada and Fisheries and Oceans Canada review and comment on the scientific data submitted by the applicant. However, even though the relationship between these departments has been placed in memos of understanding, there is no formal recognition of their role in the PCPA. The final decision to register a product rests with the Minister of Agriculture. It is here that there is at least a

perceived conflict of interest of the Department as both a promoter of food production and protector of the public from unsafe pesticides and practices. The situation parallels the experience in the United States in the late 1960's when federal pesticide law was still administered by the U.S. Department of Agriculture. The authority for pesticides registration and control was transferred to the Environmental Protection Agency in 1972. Most recently in Canada a coroner's jury,¹⁷ federal advisory consultants,¹⁸ and public health and environmental groups have called for removal of the PCPA from Agriculture Canada's sole authority.

However, it would seem that the question of who administers the Act may not be as important as the question of the substantive legislation itself and whether it is adequate in its present form.

B. The Adequacy of Testing Requirements

One issue that is still of concern is the issue of testing requirements and practices. The legacy of IBT may still be with us as Canada continues to be heavily reliant on U.S. testing. Further, IBT was not an aberration, as many people maintained. Documents obtained through U.S. Freedom of Information requests revealed that in 1979 25 out of 82 laboratories audited by the Environmental Protection Agency

revealed serious deficiencies in their work.¹⁹ Documents released at the trial of the IBT executives also raised the specter that some pesticide manufacturing companies were aware of IBT's activities.²⁰

The IBT affair has served to underscore the need for ensuring good laboratory practices in firms doing testing for pesticide industry registrations. In 1979 Health and Welfare Canada entered into an inter-agency agreement with the U.S. Food and Drug Administration regarding good lab practices, and now have their own guidelines on the subject.²¹ These, however, presently have no legal effect.

With regard to environmental toxicology testing, the scarcity of standard test protocols for both laboratory and field studies has been regarded as a serious impediment to the evaluation of the environmental hazards of new pesticides.²² It has been argued that Environment Canada (1) has an inadequate pesticide monitoring system and (2) is not privy to all information in Agriculture Canada files.²³ Environment Canada itself has noted that "much of the information supplied to Agriculture Canada is privileged and is, therefore, not generally available to research and regulatory personnel of Environment Canada." Suggested reforms in this area would include:

1. Good laborabory practices legislation;

2. Combination of independent Canadian toxicology centres, government testing capability and reciprocal international testing protocols; and
3. Regulations or protocols for environmental testing under Canadian conditions.

C. Unacceptable Risk

Presently the Minister of Agriculture may refuse to register a pest control product where he is of the "opinion" that the use of the pesticide would lead to an "unacceptable risk of harm to...public health, plants, animals or the environment."²⁴ The burden of proof is on the applicant to prove the safety of any pesticide proposed for use or sale in Canada. However given the scientific uncertainty that frequently accompanies determinations regarding the environmental health effects of chemicals, absolute safety is not what must be shown. Because the statutory test is so vague, it is arguable that there is considerable latitude for ministerial discretion as to how "unacceptable risk" will be viewed. While the U.S. legislation (FIFRA) provides for the weighing of risk-benefit or cost-benefit considerations, Canada's PCPA is silent on this matter. However, in practice, risk-benefit approaches are finding increasing favor with both industry and federal regulatory officials in Canada, notwithstanding statutory silence on the subject.²⁵ It would seem to me that there are strong policy

reasons why the PCPA should not be amended to provide for risk-benefit analysis. Some problems which have been identified include:

- (1) because it is easier to quantify the costs of regulation than its benefits, there has been a general tendency to overstate costs and understate benefits;
- (2) the state of the art in quantifying benefits is primitive, as reflected in difficulties in determining how many lives will be saved; how much pain and suffering averted and risk of environmental harm reduced. There are difficulties in applying dollar values to items that lack a market value (e.g. human life);
- (3) it is difficult to take delayed effects of toxic chemicals, including pesticides, into account;
- (4) cost-benefit analysis cannot easily deal with questions of equity, i.e. that costs and benefits are often borne by different groups of people within society; and
- (5) there are difficulties in quantitatively extrapolating animal test data to humans.²⁶

In fact, Canadian federal health officials have noted that all government departments may not look at risk in the same way. For example, perceptions about the risk from pesticides may be different if considered by an official in a Health Department

than if considered by someone whose primary concern is the need to produce more food.²⁷

Recently, a U.S. Congressional investigating committee has argued that U.S. EPA has changed the scientific principles underlying its risk assessment of carcinogenic pesticides, resulting in an approach that permits greater exposure to cancer-causing agents.²⁸

D. Research Exemptions and Temporary Registrations

Under the PCPA there are a number of ways in which pesticides may be sold or used in Canada without having to meet the full registration requirements of the Act. These include (1) exemptions for control products used for research purposes; and (2) temporarily registered pesticides where the applicant agrees to produce additional information on the product or where it is to be sold only for emergency control of infestations.

While meeting legitimate objectives such as the assessment of new products or control of emergency pest situations, possibilities exist for using these categories to circumvent the usual registration requirements.

For example, Federal officials estimate that approximately 500 research permits were approved by Agriculture Canada in 1982,

averaging 900 kilograms (400 pounds) of formulated product per approval. The size of a treated area varies from an acre for some agricultural experiments to 500 - 5000 acres for the largest areas, usually involving forestry uses. Because the data base for a pesticide under a research permit is smaller than for a pesticide with a full registration, and also because there is some indication that the numbers of research permits are increasing, federal officials admit that there is reason to be concerned about research permits becoming, in effect, operational permits.²⁹ My understanding is that new regulations are being put in place to extend the Department's control over research permit use.

In regard to temporary registrations, approximately 150 are issued a year. Since 1980 federal policy has been that temporary registrations will not be advanced to full registration status where the pesticide was supported by IBT data, unless Health and Welfare Canada provides written agreement to such an extension.

However, this does not mean that pesticides supported by IBT data will not continue to be able to receive temporary registration approval. For example, in 1981 a CCREM Task force was established to look into ways and means of improving and speeding up the registration process of pesticides in forest management. One of the pesticides involved, orthene, had a temporary regis-

tration for forestry use for several years, including 1982. The Minister of Health, the Honourable Monique Begin, stated that at that time orthene was supported by pivotal invalid IBT data including a three generation reproduction study. Therefore full registration would not be granted. However temporary registration was extended. It is arguable that the renewing of temporary registrations for several years in a row may constitute a back-door equivalent to full registration of less than fully evaluated products.

E. The Re-Evaluation Process

Once a pesticide is registered under the PCPA, it retains its registration for a five-year period that may be renewed upon application to the Minister. At any time during this period a registered pesticide may be subjected to re-evaluation.

Two factors generally trigger the re-evaluation process; (1) a new study showing potential problems not previously recognized; or (2) the need to bring the data base up to date for a long-registered pesticide. However, there are a number of problems with the existing re-evaluation process. Firstly, the process is too slow. As of mid 1982, only 45 of the approximately 600 existing pesticide active ingredients had been or were undergoing re-evaluation. These include the penoxy herbicides, chlorophenols and fumigants. According to federal officials, the Department of Agriculture is capable

of taking on only 10 - 15 chemicals a year in the re-evaluation process. Even assuming that re-evaluations for each chemical can be completed within one year and that no new chemicals are registered, it would appear that it will take between 37-55 years for the government to complete re-evaluation of just the remainder of the currently registered active ingredients.

Health and Welfare Canada officials have suggested that "a more vigorous cyclical re-evaluation of all registered pesticide products should be pursued."³⁰ They have suggested a 5 or 7 year cycle so that industry would keep its testing and data base more current.

Setting priorities for re-evaluation is also a problem and examination by Canada has been made of both the registration standards and the Rebuttable Presumption Against Registration Program (RPAR). The former program makes broad regulatory decisions at one time for a group of pesticide products containing the same active ingredient, rather than on a product-by-product basis. RPAR, on the other hand, deals with a pesticide for which evidence suggests that it may pose "an unreasonable risk to man or the environment.." This program shifts the responsibility to industry to "show cause" why an existing registered pesticide should not be further restricted. Presently these programs have been challenged in a number of lawsuits by environmentalists and labour groups who have attacked the closed-door industry-

government meetings used to reach determinations for the RPAR and the registration standards program.³¹

I would maintain that the principle behind RPAR appears to be a sound one: where a critical 'risk' standard is exceeded by an already regulated pesticide the burden should shift to industry to show that the pesticide should not be further restricted.

To the extent that Canada is at an earlier stage in dealing with existing 'bad actor' pesticides, a RPAR-like process appears to be an approach worth investigating regarding the prioritizing of pesticide reevaluations.

F. The Role of the Public in the Registration/ Reevaluation Process

The PCPA is silent on the role of the public in the registration process for new pesticides. The effect of this statutory silence is to lock the public out of Agriculture Canada's decision-making. Public notice of a registration application for a new product or use is not required under the Act; nor is public access authorized to health and safety tests relied on in support of the registration application. While a pesticide company is statutorily guaranteed an administrative appeal if a pesticide registration application is denied, no such right is provided to the public when a registration application is granted.

Further, as stated earlier, there is no opportunity for the public to trigger a re-evaluation of a specific pesticide if new evidence comes to light regarding adverse environmental or health impacts. This brings me full circle to Mr. Justice Nunn's comment in regard to using the Court instead of appeal provisions under federal statute law. However, there are no appeal provisions. In light of the lack of public input into the decision-making process perhaps Mr. Justice Nunn should not have been surprised that the landowners would have turned as readily to the courts, as there was no forum available to them under federal law.

III. CONCLUSIONS

The increasing use of pesticides in recent years has occurred at the same time as a rise in environmental and public health concerns surrounding these chemicals. The use of the common law for pesticide problems may provide adequate redress for short term health impacts and property damage. However, as the Nova Scotia case has demonstrated there are considerable obstacles to obtaining compensation for long-term health effects from pesticide exposure.

Reverse onus clauses as well as the abolition of certain defences and court cost burdens are areas of law reform needed to bring the common law into the 20th century to deal with damages from toxic chemicals.

Federal statute law, the supposed preventative end of pesticide control is also presently deficient in a number of areas, some of which I have outlined today.

Law reforms are past due in both areas.

IV. NOTES*

1. The Hon. Eugene F. Whelan, Federal Minister of Agriculture. Notes for an address to the 24th annual conference of the Canadian Agricultural Chemicals Association. (Ottawa: September 15, 1976). See also, Agricultural Institute of Canada. Pesticides, Agriculture and the Environment. (Ottawa: AIC, January 1981) at 4.
2. Agriculture Canada. Canada's Agricultural Food System: An Overview. (Ottawa: Supply and Services Canada, 1981) at 22-23. The increase was almost 75 percent after adjusting for inflation.
3. Id. at 22.
4. CTV-W-5 Show, Transcript. Edition 551. (October 23, 1983, Toronto, Ontario).
5. United Nations Environment Programme, The State of the Environment, 1979. (Nairobi, Kenya: UNEP, 1979) at 10.
6. Environment Canada. Canadian Wildlife Service. Impact on forest birds of the 1975 spruce budworm spray operation in New Brunswick. No. 62. P.A. Pierce, D.B. Peakall and A.J. Erskine. (Ottawa: CWS, 1976) at 1-3. See also Douglas J. Forsyth, CWS, "Evaluation of Pesticides by the Canadian Wildlife Service." An Address at the Canadian Council of Resource and Environment Ministers Workshop on Pesticides Use in Canada. Proceedings. (Ottawa: CCREM, 1982,) at 97.
7. R. v. Robert Caswell and Rick L. Caswell, unreported decision of Omestead, J., Provincial Court Judge, [Provincial Court (Criminal Division) County of Grey] (October 28, 1980, Markdale, Ontario); and R. v. Robert Caswell and Rick L. Caswell, unreported decision of Thompson, J., County Court Judge, County of Grey (July 27, 1981) in which the trial judge's findings of fact were upheld, but his acquittal of the defendants was overruled and a conviction instead was entered.
8. Environment Canada. Environmental Protection Service. Atlantic Region. A Review of Environmental Impacts Associated with Particular Forestry Practices in Eastern Canada. A brief presented to Newfoundland and Labrador Royal Commission on Forest Protection and Management. (Dartmouth, N.S.: Env.Canada, 1981) at 54-56.
9. Newman v. Conair Aviation Ltd. (1972), 33 D.L.R. (3d) 474 at 479 (B.C.S.C.).
10. (1978), 22 N.B.R. (2d) 147.
11. R.S.N.B. 1978, c.24.

*This paper is largely based on a draft report prepared for the Law Reform Commission of Canada, J.F. Castrilli and T. Viqod, Pesticides: An Examination of Canadian Law and Policy, (Toronto, 1984).

12. Victoria Palmer et al. v. Stora Kopparbergs Bergslags Aktiebolag (Unreported decision of the S.C.N.S.T.D., Nunn, J., September 15, 1983).
13. Cape Breton Landowners v. Stora Kopparbergs Bergslags Aktiebolag (1982), 11 C.E.L.R. 141 (Supreme Court of Nova Scotia (Trial Division)).
14. Jane Gado, "Groups urge subsidies for court challenges in the public interest", Globe and Mail, September 30, 1983.
15. The Hon. Charles Caccia, Minister of the Environment. Notes for an Address to the Environmental Law Section Canadian Bar Association (Ottawa, January 25, 1984) at 7.
16. Supra note 12.
17. British Columbia Coroner's Office. Verdict of Coroner's Jury into the October 30, 1982 death of Jarnail Singh Deol in Surrey, B.C., pursuant to the Coroners Act. The coroner's jury recommended that responsibility for registering pesticides should be transferred to Health and Welfare Canada and Environment Canada.
18. The Canadian Environmental Advisory Council recommended to Environment Canada in 1981 the replacement of the current pesticide registration system and establishment of an "independent Pest Control Evaluation Commission with its own statutory authority to make and implement decisions."
19. United States Environmental Protection Agency and United States Food and Drug Administration. Health Effects Data Quality Status Report. (Washington, D.C.: EPA/FDA, October 19, 1979).
20. United States Environmental Protection Agency and United States Food and Drug Administration. Memorandum Report on Inspection of IBT, Decatur, Ill. (Chicago, Ill.: EPA/FDA, 1978) at 22. See also Kevin Cox, "Rats run wild, laboratory report says; Safety tests on chemicals falsified," The Globe and Mail, November 17, 1983 at 5, Col.1; and Bill Richards, "Papers from Trial of Former IBT Officers Raise Many Questions on Product Safety," The Wall Street Journal, May 13, 1983 at 31, Col. 3.
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22. Government of Canada, Pesticide Use and Control in Canada. Revised for the Canadian Council of Resource and Environment Ministers Meeting of September 29, 30 and October 1, 1981 by Agriculture Canada, Environment Canada, Fisheries and Oceans Canada and Health and Welfare Canada. (Ottawa: Gov't of Cda., September 1981) at 21-22.
23. Ross H. Hall. A New Approach to Pest Control in Canada. Report No. 10 (Ottawa: Canadian Environmental Advisory Council, July 1981) at vi, 20-21.
24. C.R.C. 1978, c.1253, as am., s.18(d)(ii).
25. S.W. Ormrod, Director, Pesticides Division, Agriculture Canada, "Perspectives on Pesticides Evaluation". An address at the Canadian Council of Resource and Environment Ministers Workshop on Pesticides Use in Canada. Proceeding. (Ottawa: CCREM, 1982) at 75-76.
26. See, for example: U.S. House of Representatives. Cost-Benefit Analysis: Wonder Tool or Mirage. Subcommittee on oversight and investigations of the Committee on Interstate and Foreign Commerce, 96th Cong. 2nd Sess. (Dec. 1980) at 1-36. See also, I.C. Munro and D.R. Krewski "Risk Assessment and Regulatory Decision-Making", (1981), 19 Food and Cosmetics Toxicology Journal 549.
27. I.C. Munro, A.B. Morrison and L. Bradshaw, Health Protection Branch, Health and Welfare Canada, "Risk and the Government Process", in Risk: A Symposium on the Assessment and Perception of Risk to Human Health in Canada: Proceedings. (Toronto: Royal Society of Canada/Science Council of Canada, October 1982) at 187.
28. United States House of Representatives. EPA Pesticide Regulatory Program Study. Hearing Before the Subcommittee on Department Operations, Research, and Foreign Agriculture of the Committee on Agriculture. 97th Cong., 2nd Sess. (December 17, 1982) at 87.
29. Interview with Wayne Ormrod, Director, Pesticides Division, Agricultural Canada (June 30, 1983, Ottawa).
30. Interview with Clare Franklin, Chief, Pesticides Division, Environmental Health Directorate, Health and Welfare Canada (June 28, 1983, Ottawa).
31. Natural Resources Defense Council and American Federation of Labour-Congress of Industrial Organizations v. United States Environmental Protection Agency and William D. Ruckelshaus, Administrator US EPA. Civ. Action No. 83-1509; Complaint for Injunctive and Declaratory Relief filed in United States District Court [(District of Columbia) (May 26, 1983, Washington, D.C.)].