

REPORT OF
ACTION COMMITTEE ON
AGRICULTURAL RUNOFF CONTROL

October 1, 1999

INTRODUCTION

The Action Committee on Agricultural Runoff Control was established in late July by the Minister of Agriculture and Forestry and the Minister of Technology and Environment. The Terms of Reference for the Committee were to:

1. understand the facts of fish mortalities in Island streams (in mid-summer, 1999) and
2. identify the steps required to reduce the risk to aquatic life.

The Action Committee consists of industry, the Prince Edward Island Wildlife Federation, and provincial and federal government representatives (a list of committee members is attached as an Appendix to this report). The Action Committee began work immediately and established three working groups to rank the aquatic toxicity of various pesticides, review soil conservation practices, and identify high-risk watersheds. The work of the Action Committee also benefited from the discussions in a series of province-wide meetings of producers organized by the Potato Producers' Association.

As implied in its name, the overall mandate of the Action Committee is to identify actions that can be taken to prevent further incidences of fish kills from agricultural runoff. Fish kills reflect a real environmental threat, have potential human health implications, and if not stopped will result in real costs to farmers and the PEI economy. According to the Report of the Round Table on Resource Land Use and Stewardship, "The facts tell us that, while awareness has been heightened and attitudes have improved, action has not kept pace with the growing problem of soil degradation". The Action Committee feels this is still the case. One of the main causes of soil degradation, runoff water and resulting soil loss, is also related to the fish kill problem. The Action Committee is confident that this report will help bring about the further actions that are needed to protect Prince Edward Island's soil and water resources and aquatic life, and accelerate the implementation of more of the recommendations in the Round Table report.

THE SITUATION IN 1999 (First Term of Reference)

Prince Edward Island's geography, geology, and land use, which have resulted in low organic matter levels, have combined to create the potential for serious environmental problems. The soils are highly erodible, and with some 263 watersheds throughout the Island, the impact of soil erosion on surface water quality and marine habitats is significant. Considerable effort has been made by government and local watershed improvement groups in recent years to improve aquatic habitat in a number of these streams and rivers. Soil erosion is the single most important environmental problem in the province, resulting not only in unacceptable levels of soil loss and degradation, but also in unacceptable levels of surface water contamination, siltation and marine habitat destruction. Clearly, improving soil conservation practices will benefit both soil and water quality.

The nature of the Island's agriculture industry has increased the potential for soil erosion. The recent expansion in potato acreage has intensified the risk. Between 1989 and 1995, total production increased from 68,000 to 108,000 acres and has increased marginally to 113,000 acres

by 1999. Bare soil is highly susceptible to erosion, particularly during spring runoff and periods of intense rainfall. Agriculture and Agri-Food Canada estimates that more than 80 percent of cultivated land in the province is at high-to-severe risk of water erosion.¹ Given this statistic, it is obvious that every farmer has to pay a great deal of attention to implementing appropriate soil conservation measures in order to have sustainable agriculture.

The agriculture and agri-food industry is an integral part of the Island's economy and environment. Farm cash receipts contribute \$310 million annually with approximately half coming from potato production. The scenic pastoral landscape of fields and forests is also a major attraction for the more than one million visitors annually who contribute to the success of the Island's tourist industry. Preserving that pastoral image is not only important to the tourist industry, it is the foundation of the Province's new Food Strategy, which is based on the production and marketing of high quality, high value agriculture and food products from sustainably managed resources. Certainly this image and the opportunity for market development is not supported by runoff events and fish mortalities.

Minimizing the impacts of agricultural activity on the environment must be a major goal. The agriculture industry has already made significant investments in soil conservation practices, and the provincial government provides on-farm technical support and financial assistance through the Agriculture and Environmental Resources Conservation (AERC) program. Completion of an Environmental Farm Plan is a pre-requisite for entry into this program. The Agriculture and Agri-food Canada Research Centre in Charlottetown continues to focus research efforts on knowledge and technologies to implement sustainable agricultural production systems. Considerable progress has also been made in implementing the recommendations of the Round Table, including:

- " buffer zone legislation under the *Environmental Protection Act*;
- " support for Environmental Farm Plans;
- " the appointment of an Integrated Pest Management specialist;
- " a long-term soil quality monitoring program;
- " financial incentives for soil conservation practices, hedgerows, manure storage, on-farm pesticide and fuel storage, and fencing and watering systems for cattle;
- " revision and upgrading of the Pesticide Certification course under the *Pesticides Control Act*;
- " legislating the *Farm Practices Act* and setting up the Farm Practices Review Board; and
- " the appointment of a Field Crops specialist to identify rotation crops

The degree of uptake/implementation of the above measures has, to date, not been sufficient to prevent incidences of agricultural runoff, nor have they been fully recognized by the public or the media. Nonetheless, more must be done to prevent runoff and associated environmental impacts.

¹D. F. Acton and L. J. Gregorich, eds., *The Health of our Soils- Toward Sustainable Agriculture in Canada*, Ottawa: Agriculture and Agri-Food Canada, 1995.

There are also a number of Round Table recommendations which have not yet been implemented. These include:

- " adoption of soil conservation practices according to Tables 3 and 4 in the report;
- " mandatory three year rotation for potatoes;
- " stricter enforcement of the *Fisheries Act*, the *Environmental Protection Act*, and the *Pesticides Control Act* to protect watercourses;
- " "no cultivation" zone along public right of way and permanent vegetative cover along ditches and watercourses;
- " prohibition of row cropping on land with a slope greater than 9%; and
- " development of a pesticide reduction strategy based on Integrated Pest Management.

Fish kills in the recent past have highlighted the ongoing problems of stream siltation and contamination. There was one significant fish kill discovered and reported in each of the years between 1994 and 1996 attributed to pesticide contamination, none in 1997, one in 1998 and eight in 1999. Additional fish kills may also have gone undetected. Not only have these provoked serious public concerns, but they also have a deleterious impact on the Island's sport fishery. The economic value of the sport fishery is approximately \$7.0 million annually, and there is significant potential for expansion. However, the intangible value of a healthy freshwater habitat far exceeds its economic contributions.

Identifying the exact cause of a fish kill with absolute certainty from a scientific perspective is very difficult. Toxic substances have a tendency to move quickly through aquatic systems, and when there are time delays between a contamination event and it being discovered and reported, much of the evidence is already lost. Despite these difficulties, the 1999 evidence squarely points in the direction of agricultural pesticides being carried by runoff in solution or adhered to soil particles. Other causes have been ruled out. An analysis of fish kills in 1999 determined that: water temperatures and dissolved oxygen were within normal range for the time of year; there was sedimentation in other streams with no discernable effect on fish health; and fish were healthy before the runoff with no pre-existing diseases. *The conclusion is that fish were killed by pesticides.*

Several common themes surrounding each of the kills were established: all but one occurred in mid- to late-July when pesticides are used extensively; all followed heavy rainfall; and there was clear evidence of significant water and sediment movement from certain potato fields adjacent to the affected rivers.

It is important to note that not all potato fields adjacent to watercourses contributed to the problem. Those fields that have been found as contributing to the problem were too long, with too steep slopes, and too close to waterways to be consistent with recommended soil conservation practices. In addition, there were other contributing factors:

- " poor headland management;
- " farming through natural hollows;

- " undesirable concentrations of water flow;
- " too short crop rotations;
- " encroachment on public right-of-way;
- " potato rows running with the slope;
- " inadequate buffer zones;
- " poor soil permeability;
- " improper management adjacent to grassed waterways; and
- " tap drain and culvert that served as pathways for the runoff to travel from adjacent farmland into streams.

A number of other factors resulted in an increased potential for fish kills in 1999. The 1998-99 winter was more favourable than usual for insect survival. This together with an early spring led to more pressure from Colorado potato beetle populations, requiring the use of more insecticides to effect control, particularly when taken in context with the increasing resistance to older pesticides. Colorado potato beetles are voracious feeders which can severely damage potato crops. The hot dry weather at the beginning of the growing season meant crop canopies were later closing over, leaving more ground exposed resulting in more of the pesticides being deposited on the ground rather than on the target plants and leaving the soil exposed for direct impact by rain droplets. The result was that the heavy rainfalls over short time periods led to large volumes of runoff from those fields where soil conservation practices were inadequate. The weather patterns in 1999 are not abnormal and may occur again in the future. Permanent remedies for soil erosion and prevention of fish kills, both short and long-term, need to be implemented. The increasing frequency of severe and unusual weather patterns only adds to the urgency.

The potato industry has expressed serious concern about the fish kills in Island waters, and about the impression many Islanders have that all potato growers are poor stewards of the land. In addition, there is concern that markets may suffer from the connection between PEI potatoes and dead fish.

The Action Committee believes that even one dead fish is too many and that this can - and must - be prevented in future.

STEPS TO REDUCE RISK (Second Term of Reference)

The recommendations below are designed to make progress on the following indicators of success:

- " increase in % of potato acreage under an Integrated Pest Management (IPM)² program
- " decrease in number of fish kills related to potato production
- " increase in % of potato fields next to watercourses with a 10 metre buffer zone
- " increase in % of potato acreage with 50 metre conservation zone (fall and winter)
- " increase in % of high-severe erosion risk land using acceptable soil conservation practices
- " increase in % of total potato production using a three year (or more) rotation
- " increase in % of potato acres under an Environmental Farm Plan
- " reduction in pesticides used (kg/ha of active ingredient used) or pesticide risk
- " increase in IPM ratings
- " improved soil quality index measurements
- " reduction in concentration of suspended sediment in streams

The Action Committee on Agricultural Runoff Control believes that the protection of aquatic life can be assured by the full adoption and implementation of the recommendations which follow, including enforcement of current legislation (*Environmental Protection Act, Pesticides Control Act, and Fisheries Act*). Realizing that pest management is currently a necessary part of potato production on PEI and that agricultural pesticides are toxic to aquatic life, a principal focus of the recommendations that follow is on preventing agricultural runoff and thereby preventing pesticides from entering watercourses. These recommendations are based on the knowledge that technology is currently available to conserve soil and protect watercourses and that economic impediments to implementing such conservation practices are minimal. The recommendations are grouped into three categories: regulatory, programs and education.

Regulatory

1. There are currently clear legislative measures in place aimed at preventing the contamination of watercourses. The provincial *Pesticides Control Act* and the *Environmental Protection Act*, together with the federal *Fisheries Act*, are all quite specific about prohibiting the discharge of contaminants into watercourses. While education and incentives for change are important elements of public policy to reduce agricultural impact on the environment, there are some circumstances where strict enforcement of legislation is the only effective measure. In a joint letter to the Minister of Agriculture and Forestry on August 10, 1999, the Potato Board and Potato Producers'

² Integrated Pest Management is a system of managing pests that uses cultural, biological and chemical control in a program that is both economically and environmentally sound.

Association urged the Minister and his colleague in Environment to work with growers to encourage changes in production practices but where growers refuse to change, “to fully investigate incidences of significant soil erosion, and where substantiated, lay charges against the offender”. The Action Committee therefore, recommends, that **federal and provincial governments should strictly enforce the regulations of the *Environmental Protection Act*, the *Pesticides Control Act*, and the *Fisheries Act*.**

Ongoing

2. **All potato growers should be encouraged to implement in the fall of 1999 the amendment to the *Environmental Protection Act* requiring 10-metre buffer zones and the 50 metre conservation zone so that these zones will be in place for winter 1999-00 and the cropping season in the year 2000.**³

The legislation pertaining to the date that the 50 metre conservation zone is scheduled to come into effect should be changed from April, 2001 to August, 2000 after appropriate consultation with the industry. Information packages should be prepared and mailed to all Island farmers and land owners who lease land for agricultural production.

3. As an incentive for non bona-fide farmers to have soil conservation practices followed on their farm land, **the provincial government should amend the *Property Tax Act* so that farm land owned by non bona-fide farmers would be taxed at the farm rate if the owners or users have completed an Environmental Farm Plan and implemented the Action Plan on that property.**

To be actioned immediately.

³*The Act to Amend the Environmental Protection Act* says:

3.11.1 (6) Where land is in agricultural use, buffer zones shall be 10 metres in width. This section comes into force on April 1, 2000.

4.1.11.1 (10) Where agricultural land within 50 metres of the upland boundary of the buffer zone has an average slope of 5% or greater

(a) no person shall undertake fall tillage of land having cereal, forage or other vegetated crop cover; and

(b) every person owning, leasing or renting land shall ensure, where the land is in row crop production, that

(i) a winter cover crop is established, or

(ii) a hay or straw mulch is applied at a rate of 3.5 to 4.5 tonnes per hectare. This section comes into force on April 1, 2001.

Programs

4. **The potato industry should adopt a code of practice for soil and water conservation in potato production.** This recommendation has already been made by the Round Table on Resource Land Use and Stewardship. Most of such a code is already detailed in the publication "Soil Conservation for Potato Production". However, there should be strengthened sections in the code on buffer zone management, headland management, and pesticide risk reduction including use of IPM. Also, as recommended by the Round Table, the code should include a **minimum three year crop rotation** as the industry standard. It is recommended that **the Farm Practices Review Board be asked to designate the code as recommended above as a code of practice under the Farm Practices Act.**

To be completed by March 31, 2000 with development of the code to be the primary responsibility of the potato industry and the provincial government's technical staff with support from the Eastern Canada Soil and Water Conservation Centre.

5. **Every potato farm on Prince Edward Island should complete an Environmental Farm Plan and implement the Action Plan. Properties with excessively long and steep slopes have to be identified in the Action Plan along with the time frame in which remedial measures will be taken. Priority for funding under AERC will be given to these properties.** Environmental Farm Plan workshops are sponsored by a committee of farm organizations. The completion of an Environmental Farm Plan involves a farmer attending a one-day workshop where all farm practices are rated according to their effect on the environment. Maps of the farmer's property(ies), produced by the Department of Agriculture and Forestry, allow the producer to review all properties and to identify which fields are at high risk for soil erosion. A new 'tool' will be available by January 1, 2000 from Agriculture and Forestry's GIS service which allows for the production of maps which delineate erosion risk potential. At the end of the Environmental Farm Plan workshop, the farmer has prepared an Action Plan which identifies what should be done to ensure that his farming practices are sustainable. Assistance is available to implement the Environmental Farm Plan from the AERC program which pays 66 2/3 % of the costs up to a maximum of \$30,000 per farm per year.

Environmental Farm Plans to be completed by all potato growers by April 1, 2000.

6. **The potato industry, with support from the provincial government, should implement a pesticide risk reduction strategy based on Integrated Pest Management (IPM) principles.** This could include, but is not limited to, provision of more IPM workshops for potato growers on an annual basis and including a section on IPM in the Pesticide Certification course which farmers take every five years in order to get the certificate that allows him/her to purchase and apply agricultural pesticides.

To be implemented immediately and on an on-going basis.

7. Incentives are an effective way to encourage producers to implement soil and water conservation practices, therefore, **sufficient funding should be provided in the Agriculture and Environmental Resource Conservation (AERC) Program so that potato growers will have access to the matching funding needed to implement soil conservation practices.** Considering the number of applications received by AERC (since the program was announced in April, 1999 a total of 125 applications of which 40 are for soil conservation), there should be an increase in the promotion of the program so that all potato growers are aware of its details and merits.

To be implemented immediately and on an ongoing basis.

8. **The Department of Transportation and Public Works (TPW), in cooperation with watershed improvement groups, potato growers, land owners and provincial personnel, should identify locations where agricultural land runoff waters have the potential to impact watercourses via their discharge into and through TPW roadway ditches, tap drains ,etc. As well, TPW, in cooperation with these persons/groups should identify ways to manage such flows to minimize impact on watercourses.**

Current effort to be continued and increased.

9. **Further research should be carried out across the whole spectrum of pest management in potato production from various levels of organic specifications and various levels of IPM, up to and including genetically-modified varieties. Controlled studies should be carried out to provide reliable data on production costs, yields, and soil quality. Studies on the economics of soil conservation and the effects of pesticide mixtures should also be done. This research should be carried out jointly, by industry and government, with expertise provided by both levels of government.**

Current effort to be continued and increased.

10. **The Department of Agriculture and Forestry should allocate resources to programs and services in support of the organic and low-input food sector.**
To be implemented immediately.
11. **The Crop Protection Institute and its members should accelerate research into the development of new crop protection products which have reduced impact on aquatic life.**
To be implemented immediately.
12. **The Pest Management Regulatory Agency should continue and put a higher priority on the registration of crop protectants with lower toxicity and more specificity.**
To be implemented immediately.
13. **Considering the importance of weather information, Environment Canada should continue to provide specialized agricultural weather forecasts and improve their accuracy with respect to the potential for localized heavy rainfall.**
To be implemented immediately

Education

14. **Potato growers should be made aware of the details of the recent fish kills, the causes, and explain how soil erosion could have been avoided in those fields.**

Completed. The Potato Producers' Association of Prince Edward Island sponsored five information sessions across the Island for potato growers on August 17, 18, 19, 24 and 25. It is estimated that growers who controlled over 80% of the potato acreage attended these sessions. At these sessions, potato growers were made aware of the causes of the fish kills by staff from the Provincial Department of Technology and Environment. Soil and Water Conservation staff from the Provincial Department of Agriculture and Forestry also explained how soil erosion could have been avoided in those fields.
15. **The potato growers as well as the land owners from whose land suspect eroded soil carrying pesticides caused the fish kills should be contacted by Soil and Water Conservation staff to explain the problem to them and offer advice and assistance to avoid such occurrences in the future.**

Completed. Soil and Water Conservation staff met with the individual growers and land owners.

16. **There should be initiation and continuing communication between the potato industry and environmental organizations such as Prince Edward Island Wildlife Federation, Environmental Coalition of Prince Edward Island, Island Nature Trust, and the Prince Edward Island Atlantic Salmon Federation Regional Council.** An objective of such communication would be to provide a forum for gaining a better understanding of each others perspective and working toward a common understanding of respective goals and objectives.

Implementation during winter of 1999-2000 facilitated by the Department of Agriculture and Forestry and Department of Technology and Environment.

17. **A pesticide toxicity ranking assessment should be carried out with all commonly used pesticides to identify their relative risk to aquatic life and the resulting information communicated to producers during the normal January-March 2000 potato producer meetings and subsequently used by producers.** If the assessment identifies a pesticide(s) which presents an unacceptably high risk to aquatic life, its use should be discontinued on Prince Edward Island.

The toxicity ranking assessment to be completed by a Working Group made up of personnel from federal and provincial governments and industry by December 1, 1999.

18. **The Potato Producers' Association, cooperatively with federal and provincial agencies, should hold workshops on soil conservation methodologies, pesticide toxicities, etc. on a watershed basis across the province.**

To be implemented January-April, 2000.

19. **High risk watersheds should be identified and the information used to complete Environmental Farm Plans and in counseling farm operators regarding soil conservation practices required to prevent soil erosion and runoff.**

Identification to be completed by Department of Agriculture and Forestry personnel by January 1, 2000.

20. **Awareness/education programs for farm workers should incorporate information on soil tillage and pesticide application practices that conserve soil and protect water resources respectively.**

To be implemented immediately and on an ongoing basis, e.g through the Winter School of Agriculture.

21. **Land owners who rent land for row crop production, particularly for potatoes, should be informed about their responsibility for soil conservation and be provided with updated (to be reviewed by Potato Producers' Association, PEI Federation of Agriculture and PEI Soil and Crop Improvement Association) copies of "Model Farm Leases" prepared initially by the PEI Soil and Crop Improvement Association together with the Farm Business Management staff of the P.E.I. Department of Agriculture and Forestry.**

To be completed by provincial government by December 31, 1999.

22. **Farmers should be encouraged to actively participate in existing Island Watershed Conservation Groups.** Some groups already exist on Prince Edward Island. It would be beneficial to:
 - a) find out why more farmers are not actively involved in these groups;
 - b) encourage more farmers to participate in watershed groups; and
 - c) explore how such groups work in other provinces.

The Eastern Canada Soil and Water Conservation Centre has offered to set up a tour to look at successful groups in Quebec which typically include 20 to 60 farmers who retain professional help to ensure that water quality and environmental stewardship practices within their watershed boundary meet acceptable standards and improve.

To be implemented immediately and on an on-going basis.

CONCLUSION

The Action Committee is confident that the implementation of these recommendations will reduce the risk to aquatic life from potato production. With co-operation from all stakeholders, these recommendations will result in an increase in the adoption of soil conservation practices and a reduction in the use of the most toxic pesticides. The Committee recognizes that a great deal of work must be done to protect Prince Edward Island's aquatic life in watercourses and improve the market image of Island potatoes.

**APPENDIX A
ACTION COMMITTEE MEMBERSHIP**

Organization/Role	Representative
Chair	Carl Willis
Potato Producers Association of Prince Edward Island	Scott Howatt and John Phillips
Prince Edward Island Federation of Agriculture	Mette Ching
Prince Edward Island Wildlife Federation	Daryl Guignon
Prince Edward Island Soil and Crop Improvement Association	Alan Rennie
Farm Practices Review Board	Ralph Yeo
Crop Protection Institute	David Thompson
Environment Canada	Libby Douglas
Pest Management Regulatory Agency	Wendy Sexsmith
Agriculture and Agri-Food Canada	Christiane Deslauriers
Department of Technology and Environment	Clair Murphy
Department of Agriculture and Forestry	Richard Veinot
Department of Transportation and Public Works	George Trainor
Eastern Canada Soil and Water Conservation Centre	Gordon Fairchild
Secretariat	Teresa Mellish