

**USING SUBSIDIES TO PROMOTE
ENVIRONMENTAL PROTECTION IN
AGRICULTURE:**

A Review of Programs in North America and Europe

West Coast Environmental Law Association

Christopher J.B. Rolfe

Barrister & Solicitor

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CONTENTS

Introduction.....	1
Subsidies For Environmental Protection Measures.....	4
Management Practice Subsidies.....	5
Canadian Programs.....	5
European Programs.....	6
Management Subsidies for Environmentally Sensitive Areas.....	8
Potential for Environmental Management Subsidies in British Columbia...	9
Set-aside and Acreage Reduction Programs:.....	9
Canadian Programs.....	10
American Programs.....	11
European Programs.....	13
Potential for Set-Aside Programs in British Columbia.....	13

North American Waterfowl Management Plan.....	14
Potential for improvements to the Pacific Coast Joint Venture.....	16
Subsidies for Equipment and Capital Improvement.....	16
British Columbia.....	16
Other Jurisdictions.....	17
Provision of Farm Infrastructure.....	18
Incentives for Organic Farming.....	19
Conclusions and Summary.....	19
Cross-compliance Measures.....	20
Cross-compliance Measures In Canada.....	22
Major Support Programs in British Columbia.....	22
The Potential for Cross-compliance in Canada.....	24
Conclusions.....	26
List of References.....	28

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Introduction

This report examines the ways in which subsidies or payments to farmers have been used in jurisdictions throughout North America and Europe to pursue environmental ends.[\[1\]](#) The report is divided into two parts. The first part examines subsidies which are directly intended to encourage environmental protection. The second part looks at means by which major domestic support programs -- programs mainly intended to support farmer incomes and encourage exports -- can be used to encourage sound agro-environmental practices by tying eligibility to minimum environmental practices.

The need to encourage sound agro-environmental practices is clear. A joint federal-provincial committee on environmental sustainability in agriculture listed soil degradation and stream sedimentation; wildlife habitat conservation; contamination of surface and ground water by agricultural by-products, pesticides and nutrients from fertilizers and manure as the largest environmental problems associated with farming in British Columbia.[\[2\]](#)

These problems have significant costs to both farmers and society. For farmers high rates of soil erosion mean a depletion of their environmental capital. Annual soil erosion losses in the Fraser Valley have been measured at over 40 tonnes per hectare.[\[3\]](#) Build ups of potassium and copper in soils in the Fraser valley due to input intensive farming may interfere in the growth of some plants and livestock.[\[4\]](#) In the Prairies organic matter -- the living component of soil -- has declined by 40 to 50% since cultivation began.[\[5\]](#)

The agriculture sector has largely mitigated the effects of soil loss on agricultural production by eliminating or reducing the amount of tillage, and by using organic and chemical inputs,[\[6\]](#) but soil erosion continues to cause water pollution, loss of fish habitat and loss of potable water.[\[7\]](#) And several of these answers to soil erosion -- intensive chemical and natural inputs -- pose threats to the wider environment. For instance, in the Fraser Valley excess nitrates in both manure and artificial fertilizers, as well as phosphorous and pesticides, leach through soil and enter aquifers. Nitrate levels in the important Abbotsford aquifer exceed recommended levels for drinking water.[\[8\]](#) Some persistent pesticides have been found in Fraser Valley aquifers six years after farmers stopped using them. Runoff also contaminates surface waters.

Another major impact of agriculture on the environment has been loss of wildlife habitat and biodiversity. Canada's 1991 State of the Environment Report states:

"Of all human activities, agriculture has probably had the greatest effect, directly and indirectly, on wildlife. By clearing forests, replacing natural vegetation with crops, draining wetlands, and destabilizing natural biochemical balances by the use of chemical fertilizers, insecticides and herbicides, agriculture has been responsible for dramatic reductions in numbers and range of some species and the introduction of other species into new areas.

...

Agriculture has had a serious impact on the quality and quantity of wetlands in the southern latitudes of Canada. Drainage of marshes and sloughs to create croplands has counted for 85 percent of all losses of wetlands across the country."[\[9\]](#)

Since the Second World War subsidies to farmers have encouraged much of the environmental degradation caused by agriculture. In Canada over eight billion dollars was spent by the federal and provincial governments to support agriculture in 1991-92.[\[10\]](#) Almost two thirds of this amount was from the federal government and approximately three to five billion dollars of this could be considered as direct production and export subsidies.[\[11\]](#)

These subsidies come in many forms. They include income, revenue and crop insurance programs; tax breaks; price stabilization programs; subsidizing the cost of farming practices, capital improvements or management plans; and grants for taking land out of or not putting land into production. Agricultural subsidies can contribute to environmental problems in a number of ways. For instance, tax deductions for agricultural inputs can encourage overuse of pesticides and discourage efficient use of manure throughout B.C.; improperly designed subsidized crop insurance programs can encourage planting on marginal lands, monocultures, or other environmentally negative practices;[\[12\]](#) and subsidized grain transport can encourage over-concentration of livestock in the Fraser Valley.[\[13\]](#)

However, subsidies are increasingly being offered as a solution to today's agro-environmental problems. Avoiding agro-environmental problems may impose costs on farmers that they are unable to absorb. For instance, simply because they can not afford the capacity to store manure for long periods, farmers often apply manure several times during the winter months when it is highly susceptible to leaching and run-off and when its nutrients are least likely to be absorbed by plants.[\[14\]](#) Subsidies for manure storage facilities are one means of overcoming the problem.

The survey of subsidy and payment programs in this report comes at a particularly important time for policy makers who wish to ensure sustainable agriculture and an intact environment. Two events suggest that the time is ripe for increased use of agro-environmental subsidies. First, current negotiations over a new General Agreement of Tariffs and Trade ("GATT") -- the so-called Uruguay Round negotiations -- will likely result in a decline in agricultural subsidies. Proposed revisions to GATT call for reductions in agricultural support payments of 20 percent to 36 percent. This reduction could lead to approximately one billion dollars annual savings in Canada by the year 2000.[\[15\]](#) A

recent report published by the National Round Table on the Environment and the Economy recommends that:

"The government of Canada redirect that portion of agricultural subsidies that will be removed under a reformed GATT, about one billion dollars per year, or a portion thereof to create incentives for farmers and rural land owners to deliver "ecological services" from private land as the newest farm product. These services would take the form of biodiversity conservation, wetlands for flood control and water management, trees, endangered species habitat, buffer zones along waterways and wildlife habitat among others."[\[16\]](#)

The second event which makes the time ripe for changes to agricultural subsidies to promote environmental protection is the current environmental review of Canada's major domestic support programs. These environmental reviews are currently being prepared or reviewed by the government to determine whether eligibility for farm support subsidies should be made conditional on farmers meeting minimum environmental standards. Legislation is already in place to make farmers' eligibility for these programs dependent on measures to protect the environment.

Subsidies For Environmental Protection Measures

This section will discuss the main types of subsidies available to farmers who undertake environmental protection measures, or who refrain from activities that degrade the environment. It discusses neither subsidies which are available to all sectors for environmental protection measures[\[17\]](#) nor subsidies to farmers' associations engaged in technology transfer or education programs.[\[18\]](#) We have included payments to farmers for undertaking activities which have little value to their farm but which may benefit the environment. Some writers have said that such payments for ecological services are not subsidies in that they do not underwrite the cost of agricultural production.

Five types of subsidies are covered:

- management practice subsidies;
- set-aside and acreage reduction programs;
- equipment and capital improvement subsidies;
- provision of infrastructure; and
- incentives for organic farming.

Individual programs may involve elements from several of these classifications; for example, the North American Waterfowl Management Plan involves both management practice subsidies and set aside subsidies.[\[19\]](#)

Management Practice Subsidies

A number of programs compensate farmers for using environmentally superior farming methods. Such methods include refraining from the use of fertilizers or pesticides; use of winter catch crops[\[20\]](#) and increased use of conservation tillage.[\[21\]](#) The relative environmental merit of each method is subject to debate. For instance, while conservation tillage reduces soil erosion it is often associated with increased use of herbicides to control weeds. This section does not attempt to evaluate the environmental effectiveness of one method over another.

Canadian Programs

In Canada, the most common method of promoting environmental protection in agriculture is to fund approved management projects, which can include payments for adopting particular practices as well as subsidization of actual costs incurred. A number of these programs have been established under the joint federal provincial Land Management Assistance Program ("LMAP"). LMAP funds are available both for projects aimed at sustaining the natural resource base for agriculture but also increasing long term financial returns for non-grain producers. The 22 million dollars of the federal budget allocated to this program for the years 1991 to 1994 is divided among the seven non-prairie provinces according to their farm acreage.[\[22\]](#)

LMAP programs vary enormously according to the details of agreements worked out between the federal government and provinces. Examples of LMAP programs which encourage sustainable management practices include:

- In **Ontario**, the **High Crop Residue** program provides acreage payments for producers that eliminate or minimize tilling and retain crop residue on their fields. Farmers can receive up to \$30 per acre each year if there is a minimum of 30% crop residue coverage at the time of planting and \$20 per acre for at least 20% residue coverage. Compensation is payable up to a maximum of 100 acres or 30% of the previous year's planted acres.[\[23\]](#) \$3.6 million dollars is budgeted for the program in the most recent fiscal year.
- In **New Brunswick**, the New Brunswick Ministry of Agriculture makes per acre payments for **management practices that reduce soil erosion** and increase the organic content of soil. Payments of \$50 per acre are available for green manure crops, and \$15 per acre for winter catch crops.[\[24\]](#)

European Programs

A number of European jurisdictions have adopted schemes which compensate farmers for adopting certain management practices. Notable examples are:

· The **German Nature Conservation Act** authorizes optional **region-specific compensation** for adopting environmental management practices.[\[25\]](#) Farmers are compensated for participating in a number of measures including refraining from spraying pesticides in fields or around the edge of crops, reducing fertilizer use, leaving meadows unused during insect hatching periods, and refraining from changing grassland into cropland. The amount of compensation paid varies considerably depending upon the specific measures taken by the farmer and the income losses incurred.[\[26\]](#)

· **Swedish** farmers are compensated for leaving at least 10% of their arable land in **summer fallow** followed by an autumn cover crop to reduce erosion during the winter. The amount paid is in proportion to the potential productivity of the land.[\[27\]](#)

· Several European programs pay farmers for refraining from spraying around the edge of crops. **Crop-edge programs** have been successfully utilized in the **United Kingdom**.[\[28\]](#) Farmers who do not spray strips around fields, amounting to at least 2.5% of the total area of cereals on the farms, receive compensation. Studies show that the program significantly enhanced bird and butterfly populations while having very little effect on crop yields.[\[29\]](#)

· **Germany** is considering subsidies to encourage **storage and inter-farm exchange of manure**. The subsidies would be paid in whole or in part by a tax on fertilizers which would help induce better use of manure and would be implemented in tandem with regional-specific regulations to limit stock concentrations which produce more manure than can be absorbed locally.[\[30\]](#)

· Since 1988 **European Community** regulations have directed member states to adopt **incentives** encouraging lowering production without reducing the acreage being cultivated. The purpose of these programs is **to encourage low input farming** techniques. Most states have opted for programs specifically aimed at encouraging organic farming,[\[31\]](#) but the regulations also envisage programs under which farmers would enter into agreements to reduce their production by twenty percent within five years. Farmers could do so by reducing inputs such as fertilizers, or reducing the number of animals per acre but would not be allowed to reduce acreage of land cultivated or grazed.[\[32\]](#)

Management Subsidies for Environmentally Sensitive Areas

Regulations under the Community's Common Agricultural Policy require members to make payments available to farmers in areas designated as environmentally sensitive to assist the farmers in following recommended practices.[\[33\]](#) A number of initiatives have been adopted under these regulations including the following:

· The **Netherlands** restricts certain farming practices in designated **water protection zones** and the farmers are compensated annually based on the number of hectares affected by the restrictions.[\[34\]](#) The Netherlands also arranges contracts between farmers in sensitive areas and the government for farming practices which are compatible with the natural environment of the area.[\[35\]](#)

· The **United Kingdom** identified **nitrate sensitive areas** in 1990 in response to soil degradation and pollution problems in lakes, rivers, aquifers and the ocean.[\[36\]](#) Farmers with land in these

areas are eligible for two types of environmental management scheme. Under the basic scheme farmers receive an annual per hectare payment for restricting the use of nitrogenous fertilizers and animal manure, sowing a crop or cover crop to avoid bare land in the fall, and retaining hedgerow and woodland. Compensation payments vary from area to area depending on compliance costs. Under the "Countryside Premium Scheme" higher compensation is available for taking arable land out of production, establishing permanent cover and undertaking conservation activities. This scheme is further described below.[\[37\]](#) Approximately 87% of the land designated as nitrate sensitive is involved in the basic scheme and 13% in the premium scheme.

- **Denmark** has designated approximately 4% of arable land as environmentally sensitive, and farmers in **environmentally sensitive areas** can enter into management plans which require them to establish permanent cover and shift to grazing.[\[38\]](#)

- The **U.K. Countryside Stewardship Scheme** was introduced in 1991 for the management of environmentally sensitive areas. Farmers owning land in the designated areas can be paid for management practices designed to restore valued landscapes and habitats and to improve public access. Farmers receive payments for restricting drainage, fertilizer and pesticide use and grazing levels.[\[39\]](#) The scheme was reviewed recently from environmental and economic perspectives and found to be successful.[\[40\]](#)

- In **Germany water protection zones** have been designated in which restrictions on farming practices are aimed at reducing the leaching of nitrates and pesticides into groundwater. Restrictions may include limits on use of nitrogen fertilizers and are often stricter in the inner sections of the zones. Farmers are compensated by annual payments per hectare affected, with payments reflecting the extent of restrictions and their impact on farm incomes.

Potential for Environmental Management Subsidies in British Columbia

British Columbia has no subsidy program for environmental management practices other than a few habitat protection programs under the North American Waterfowl Management Plan.[\[41\]](#) Many of the European programs, for instance, those encouraging reduced use of nitrate fertilizers in sensitive areas may be especially relevant in the British Columbia context where over application of fertilizer and manures has led to nitrate contamination of ground and surface water.

Set-aside and Acreage Reduction Programs:

Programs which retire a percentage of a farmer's land for a period of time in exchange for compensation payments were originally designed to control supply as well as to give the farmer some income support. Although set-aside and acreage reduction programs which are aimed at controlling pollution discourage extending production into marginally productive lands, they can encourage intensified production on the remainder of a farmer's land.[\[42\]](#) On the other hand, programs specifically aimed at conserving soil and contributing to the protection of habitat have proved useful in meeting these ends.

Canadian Programs

In Canada programs under which farmers could potentially receive funding for taking or keeping environmentally sensitive land out of production include the following:

- The **Permanent Cover Program** for the prairies was initiated in 1988 in Alberta and Saskatchewan to reduce cultivation and encourage planting of perennial vegetation on highly erodible or marginal prairie lands where cultivation is causing soil degradation.^[43] It was extended in 1991 to cover Manitoba and the Peace River region of British Columbia and expired in March 1993. With a total budget of \$69 million approximately 1,197,000 acres have been put under permanent cover.^[44] The program is administered by the Prairie Farm Rehabilitation Administration within Agriculture Canada.

Under the program, farmers signed 10 or 21 year legally binding contracts rendering them ineligible for crop insurance or other financial privileges on land specified in the contract. The agreements were registered against title to the affected land to bind subsequent purchasers. Eligible lands must have been continuously cropped or under a crop fallow rotation. An initial one time payment of \$20 per acre was issued to approved applicants after the eligible acres had been seeded to permanent cover. A second payment of \$25 or \$60 respectively was issued for 10 or 21 year agreements.^[45] The potential of the program to protect important habitat has been maximized by coordination with Ducks Unlimited as part of the North American Waterfowl Management Plan.

- The **Ontario Permanent Cover Program**. The objective of this LMAP^[46] program is to allow a farmer to bid for up to \$10,000 in assistance to retire fragile croplands and establish permanent cover of either grass or trees. Bids are reviewed by local peer groups and evaluated against priorities set by local municipalities and conservation authorities. The program encourages buffer strips along watercourses, creation of forested blocks on erodible lands, buffer strips around wetlands and windbreaks. The programs' budget has most recently been set at \$2,954,000 per year^[47] almost all of which is for payments to farmers.

Other than the Permanent Cover Program in the Peace River, no programs appear to be specifically aimed at getting or keeping B.C. farmland out of production.

American Programs

Conservation Reserve Program

In the United States the Conservation Reserve Program^[48] was initially implemented under the *Food Security Act of 1985* (the "1985 Farm Bill")^[49] to reduce soil loss by retiring millions of acres of highly erodible land from production. The program was intended to reduce agricultural non-point sources pollution of waterbodies by pesticides, sediments and fertilizers. In 1990 the *Food, Agriculture, Conservation and Trade Act* (the "1990 Farm Bill") established a separate Wetlands Reserve Program and made farmed wetlands ineligible for the CRP. At the same time the *Food, Agriculture, Conservation and Trade Act* expanded the CRP to withdrawal of non-erodible land which is important to ground and surface water protection. For instance, strips

along wetlands, lakes and rivers which filter sediment and chemical runoff from adjacent land can be enrolled in CRP even if not erodible.

Under the program farmers submit bids to the Secretary of Agriculture to take some or all of their highly erodible land out of crop production and put it in the Conservation Reserve for 10 to 15 years. The bids require an erosion control or conservation plan, usually calling for planting of tree cover. Farmers who plant hardwood trees or construct wildlife corridors, windbreaks or shelter belts may request contracts up to 15 years in length. The government pays a yearly rental payment in return. Payments are not supposed to be higher than local rental rates for comparable land and are limited to \$50,000 per person. Bids exceeding a maximum per-acre amount established by the Secretary of Agriculture will not be accepted.

The federal government will also pay for half the cost of implementing the erosion control plan. This incentive may in some cases be insufficient. For instance, farmers may be reluctant to enroll vegetative filter strips due to the high costs of maintaining such strips. Some states provide additional cost sharing assistance or tax benefits that supplement the federal benefits. For example Virginia and Maryland provide additional funding for maintenance of vegetative strips. Additional funds may be also available for areas targeted by the North American Waterfowl Management Plan.

As of August 1992, farmers had enrolled 36.5 million acres in the Conservation Reserve Program. An additional 6 to 11 million acres is expected to be enrolled in the next three years. Average soil loss on CRP Land has declined to one tenth of the former rate.^[50] Farmers have planted 2.4 million acres in trees, 31 million acres in grass, and another 2 million acres in plantings specifically intended to benefit wildlife. Although the program has reduced fertilizer and pesticide use on reserve lands there appears to be an intensification of production (using increased fertilizers and pesticides) on the lands not placed in reserve. The benefits of the CRP to natural resources, including water and air quality and soil productivity has been estimated at \$10 billion per year, not including benefits to wildlife and flood control.^[51]

Wetlands Reserve Program

The 1990 Farm Bill also established the Wetlands Reserve Program, modeled after the Conservation Reserve Program. The Wetlands Reserve Program took over wetlands enrolled in the CRP between 1989 and 1990. The Department of Agriculture is directed to enroll up to one million acres between 1991 and 1995. Forty six million dollars was set aside for the program in 1992. Farmed wetlands and agricultural land converted from wetlands, as well as buffer zones and some riparian areas are eligible for enrollment. Enrolled lands must be subject to permanent conservation covenants or covenants for thirty years.

Farmers are required to implement conservation plans approved by the Soil Conservation Service and the Fish and Wildlife Service. Only agricultural uses such as periodic haying or grazing which are compatible with protecting wetlands are permitted.

Participants receive a lump sum for permanent easements or ten equal payments for thirty year easements. Payments are not to exceed the difference in market value of land covered by the

easement. Fifty percent cost sharing for approved conservation measures is available for thirty year easements and 75% cost sharing for permanent easements.

Both the Conservation and Wetlands Reserve program are now administered together as the Environmental Conservation Acreage Reserve Program. The United States Department of Agriculture is scheduled to release an evaluation of the programs late in 1993.[\[52\]](#)

European Programs

Set aside programs specifically aimed at protecting habitat, or avoiding farming of sensitive areas are much more likely to have significant environmental impacts. As noted above under the "Countryside Premium Scheme," United Kingdom farmers in nitrate sensitive areas can receive compensation for converting arable land to grassland and undertaking practical conservation measures such as restoring hedgerows and cultivating wildflower meadows.[\[53\]](#)

Eight of the eleven provinces in former West Germany are involved in grassland extensification schemes designed to preserve wild plant and animal species. Farmers are also paid for refraining from changing grassland into cropland. The amount of compensation paid varies considerably depending upon the specific measures taken by the farmer and the income losses incurred.[\[54\]](#)

In the U.K. the Farm Woodland Scheme provides grants for the cost of trees and annual payments for planting trees on agricultural land. The payments reflect lost income and are larger the more productive the land removed from production. Payments are also higher for trees considered to be environmentally preferable. The program is quite small, with only 36,000 hectares targeted.[\[55\]](#) The U.K. also provides grants for constructing hedgerows.

Potential for Set-Aside Programs in British Columbia

The use of set aside programs specifically aimed at taking highly erodible land out of production, encouraging restoration of habitat or taking areas highly susceptible to groundwater contamination out of intensive production should be considered for British Columbia. The experiences of the United States with the Conservation Resource Program, of Ontario with the Permanent Cover Program for establishing buffer strips along waterways, and the United Kingdom's Countryside Premium Scheme all stand out as programs which could be easily adapted to British Columbia's needs.

North American Waterfowl Management Plan

The North American Waterfowl Management Plan ("NAWMP") was signed between Canada and the United States in 1986, and was endorsed by Mexico in 1989. The agreement's objective is to restore waterfowl populations to the levels of the 1970's by securing over 2.5 million hectares of wetland and upland habitat across Canada. \$1.5 billion will be spent over 15 years, \$1 billion of which will be spent in Canada.[\[56\]](#)

NAWMP identifies 34 areas of concern for habitat throughout North American, and also identifies the financial resources and actions that are to be taken by governments, the private

sector and agricultural interests to resolve land use problems. To implement a plan of the magnitude of the NAWMP, it was necessary to break the plan down into smaller manageable segments. Thirteen joint ventures were formed throughout North America. These include the Pacific Coast Joint Venture ("PCJV") which is aimed at restoring habitat from San Francisco Bay to Prince Rupert and the Prairie Habitat Joint Venture ("PHJV") in the three prairie provinces.

The PHJV is the largest joint venture. It seeks to enhance or restore wetland and upland habitat on 3.6 million acres of land in the southern Canadian Prairies.^[57] Through individual provincial plans a variety of programs have been identified for field implementation. Crown corporations with directors from a number of governmental and non-governmental organizations are responsible for implementing the plan in Saskatchewan and Manitoba. Programs developed under the PHJV include:

- the **Manitoba Habitat Heritage Program**. Under this program landowners enter into five year agreements with the Manitoba Heritage Corporation and the Manitoba Ministry of Natural Resources, to maintain wildlife habitat in its present state. Payments are based on acreage and value of the land. Priority is given to lands vulnerable to agricultural development. Payments are limited to \$1000 per year and \$8 per acre per year.^[58]

The effectiveness of programs such as the Manitoba Habitat Heritage Program have been limited partly because they have to compete with domestic support subsidies which discourage the conversion of marginal land to waterfowl use.^[59] According to a study funded by the PHJV government expenditures on taking marginal land out of production to encourage habitat preservation saves tax payers money by reducing expenditures under domestic support programs.

- The **Prairie Conservation of Agriculture, Resources and Environment (CARE)** program operates in Alberta, Saskatchewan and Manitoba and is a major element of NAWMP. The program is designed to restore declining waterfowl populations by encouraging farmers to set aside parcels of land, primarily wetland habitat, or change management practices so that wildlife and agriculture can co-exist. As well as including demonstration projects and leasing of hay land and pasture, farmers receive payments for management practices such as delayed haying, deferred grazing, limited tilling, and rotational grazing.^[60] Payments of \$7 per acre are made to delay cutting of hay and farmers receive free seeds for waterfowl forage plus payments of \$20 per acre less the cost of forage seeds if they establish a satisfactory crop for waterfowl forage. Farmers also receive up to \$10 per acre for reducing tillage of fields left fallow during the summer.

- **Alberta Buck for Wildlife Program** was established in 1973 and is carried out by the Alberta Fish and Wildlife Branch and Ducks Unlimited, Canada. It has been incorporated as one component of the NAWMP. Funds from hunting and fishing licenses provide financial incentives to landowners to retain critical wetland and upland habitat.

Implementation of the Pacific Coast Joint Venture began in 1992 and to date remains limited. The Pacific Coast Joint Venture calls for securing 55,400 hectares through purchase or administrative transfer. However, it also calls for:

- payments to encourage certain management practices (for example winter flooding, eliminating fall tillage, and moist soil management);
- payments to take land out of production; and
- purchases of restrictive covenants.

The **Greenfields** project in the Delta area is an example of the first type of program.[\[61\]](#) The project reimburses farmers for the costs of cover crop seed and pays \$9.00 per acre for planting costs on fields previously impacted by widgeon ducks.[\[62\]](#) The costs of the Greenfields project is paid for by the Canadian Wildlife Service with Fraser River Action Plan funds, and by Ducks Unlimited. Payments under the Greenfields project account for about 50 to 60 percent of farmers' costs in planting winter cover crops. Although the planting of winter cover crops benefits farmers by enhancing soil, the program is hampered by a lack of recognition among farmers as to these benefits.[\[63\]](#)

Potential for improvements to the Pacific Coast Joint Venture

The Pacific Coast Joint Venture is an ambitious plan which appears to be hampered by lack of funding. There is a clear potential to redirect funds from existing support programs to habitat protection and enhancement programs involving payments to farmers. Payments for conservation covenants and improved management practices can potentially help support the agriculture sector and protect the environment.

Subsidies for Equipment and Capital Improvement

One of the most common forms of subsidy is a government payment, loan or guarantee for the cost of capital improvement projects, purchasing farm equipment and improving the environmental design of farms. A number of Canadian programs help to fund expenditures associated with environmental costs. Many of these are carried out under the Land Management Assistance Program ("LMAP").[\[64\]](#)

British Columbia

In British Columbia, the main source of assistance for costs of improved environmental management practices is the **Agricultural Land Development Assistance** ("ALDA") program established under the *Agricultural Credit Act*.[\[65\]](#) The ALDA program provides producers with **long-term, low-interest loans for specified on-farm capital improvements**.[\[66\]](#) Not all ALDA eligible improvements encourage environmental sustainability. For instance, new land clearing is eligible for ALDA subsidies. Capital expenditures that qualify for ALDA loans include conservation tillage equipment; livestock waste storage facilities; improvements ensuring that intensive livestock feeding is kept away from surface water courses; seeders for cover crops; waste management facilities; and run off control. Waste management facilities that qualify for assistance must be recommended as part of a Best Waste Management Plans. The costs of such plans are paid under the Land Management Assistance Program.

The Canada/British Columbia **Green Plan for Agriculture** commenced in April 1993, and is administered by the B.C. Ministry of Agriculture, Food and Fisheries and the B.C. Federation of Agriculture. It **pays 50%, up to a maximum of \$5,000, for approved projects that help farmers move to environmentally friendly practices.**[\[67\]](#) Twelve million dollars (half federal/half provincial) is allocated for the first four years of the program, although a large portion of this will be devoted to education, research and establishing producer conservation organizations.

Also, under the **Canada - British Columbia LMAP Agreement**, the Agricultural Research and Development Corporation[\[68\]](#) administers a program that **pays farmers 50%, up to a maximum of \$5,000** of approved expenditures that assist farmers **in complying with Codes of Acceptable Practice.**[\[69\]](#) The program commenced in July 1992 with a \$357,000 budget for three years, and 33 projects are approved up to the 1993/94 fiscal year.[\[70\]](#) Eligible expenditures must be related to soil conservation, enhancement of water quality, or waste management.

Other Jurisdictions

Programs similar to British Columbia's assistance for complying with Codes of Practice exist in every province. A few programs which stand out either in terms of what is funded or the degree of assistance available include the following:

- In **New Brunswick** the Land Management and Conservation Program funds **66%** of the cost of **diversion terraces** and waterways.[\[71\]](#)
- Under the joint **Newfoundland** - federal Soil and Land Management Program **approved land management** projects considered to be in the public interest can receive **up to 100% of the cost** of the projects. If projects are considered to be primarily beneficial to a specific farm operation they can receive up to 75% of the project costs.[\[72\]](#)

Subsidies for capital costs and improvements are also widely available in Europe. Grants covering a portion of capital costs are often used to help farmers meet new regulatory standards.[\[73\]](#)

There appears to be no need for new capital cost assistance programs in British Columbia, although the adequacy of available programs' funding and the effectiveness of program delivery warrants further consideration. Underwriting the cost of developing and implementing Best Waste Management Plans could be expanded to cover the costs of all best environmental management plans. For instance, the government could pay the costs of developing site specific best soil conservation management plans and groundwater protection plans and assist in costs of implementing such plans.

Provision of Farm Infrastructure

In some cases it may be more cost effective to develop central facilities for dealing with farm waste rather than to help farms develop their own facilities. For instance, in the Netherlands central manure storage facilities have been built for use by farmers. The Dutch program is part of an integrated mix of charges, regulations, and provision of agricultural infrastructure intended to

stop contamination of ground water with nitrates and phosphorous from manure. Dutch regulations include limits on livestock production densities depending on amounts of phosphorous in the livestock manure, bans on shifting livestock production to environmentally sensitive areas, levies on farms that produce more phosphorous in manure than can be taken up by grasslands, provision of infrastructure such as a central manure bank and manure processing facilities. These facilities must be used for any surplus manure.

While the Netherlands scheme is not a subsidy (because the infrastructure is paid through levies on surplus manure) similar programs could be partially subsidized. The Dutch system is noteworthy because of the combination of providing infrastructure paid for through levies and mandatory use of the infrastructure. Similar programs could be studied to combat similar problems in the Fraser Valley.

Incentives for Organic Farming

Farmers considering switching to organic farming are often inhibited by the fact that stopping use of chemical fertilizers and pesticides will lower productivity in the short term, but higher prices for organic produce are not usually available until a farm has not used chemical inputs for several years. Organic farming is encouraged by a number of European countries who offer conversion grants which compensate farmers for lost income during the switch-over from traditional to organic agriculture.[\[74\]](#)

Typically, the level of support is highest in areas where the consequences of high-input farming are most serious.[\[75\]](#) Some countries, such as Germany and Finland, offer one-time payments for the conversion to alternative methods. Others, such as Sweden and Norway, offer aid for up to three years. Under the Swedish program the land devoted to organic farming is expected to quadruple.[\[76\]](#)

Similar programs may be particularly appropriate for the Fraser Valley where the costs of intensive high input agriculture are becoming increasingly apparent.

Conclusions and Summary

The above programs show the wide variety of programs that are potentially available to encourage environmentally preferable practices in the agricultural sector. Expanding these programs does not necessarily involve an increase in overall subsidies. A shift from current subsidies to payments for ecological services can be made in the context of reducing subsidies under GATT. Studies of European Community Agricultural Policies have suggested that a shift from price support to environmental management payments to farmers is, at no extra cost to the taxpayers, capable of simultaneously reducing agricultural output, maintaining farm incomes and farm populations, reducing food prices, and providing unequivocal environmental benefits such as reduced pollution and improved wildlife habitats and landscapes.[\[77\]](#)

The current subsidies for developing best waste management plans and associated capital improvements could be expanded to develop best management plans for groundwater protection or pest management. Such plans could be used to develop site specific prescriptions for fertilizer

applications, sowing catch crops that absorb nitrates during the winter, and avoiding frequent or deep ploughing.[\[78\]](#) The subsidies available could also be expanded to encompass recommended management practices, especially when these would not otherwise be cost effective for farmers. Subsidies have advantages over regulations in encouraging the development of best management plans since regulations are at best difficult to enforce and the voluntary nature of subsidized programs encourages necessary "buy-in" of farmers to the plan development and implementation process.[\[79\]](#)

Also, the potential for set-aside programs aimed at encouraging preservation or reclamation of environmentally sensitive land or important habitat should be further explored. Similarly, incentives for shifting to organic production and the provision of central facilities for manure storage and processing in the Fraser Valley warrant further study.

Subsidies aimed specifically at encouraging environmentally superior practices are now and are likely to continue to be permissible under international trade law. The Uruguay round of international trade negotiations has targeted reductions in trade distorting agricultural subsidies; however, the proposals currently being debated[\[80\]](#) specifically exempt environmental programs.

Cross-compliance Measures

Subsidies for undertaking environmental measures can encourage improved environmental practices. Another potentially far-reaching method is making farmers' eligibility for domestic support programs conditional on environmental practices.

Although many subsidy programs have been recently reformed to avoid encouraging overproduction, there has only been a limited move to using domestic support programs as a tool to actively encourage environmentally superior farming practices. The United States is the most advanced country in linking farmers' eligibility for major agricultural support programs to compliance with conservation programs. cross-compliance was introduced in the *1985 Farm Bill*.[\[81\]](#) Rather than making direct payments to farmers for complying with an approved management plan, cross-compliance made participation in price support and other programs conditional upon adoption of soil conservation measures.

Under the *1985 Farm Bill*, arable land which is vulnerable to erosion is designated as highly erodible. Farmers must have implemented an approved conservation plan by 1990, and be in full compliance with the plan by 1995, or risk losing their federal agricultural support benefits for this land. Conservation plans are agreed upon by local committees of farmers and Department of Agriculture officials.

By 1992 over 1.3 million conservation compliance plans had been written covering 135 million acres. Farm plans typically take 4-8 hours to prepare. Plans generally require adjustments in cultivation practices and rotations and might include maintaining crop residues on fields in winter, contour ploughing, minimum tillage, and shelter belts. The costs of implementing the plans has been estimated to be between \$7 and \$17 per acre, depending on the region.

Benefits that can be withdrawn in the event of non-compliance include price support loans, federal crop insurance, and disaster payments.^[82] Loss of these benefits has been estimated to cost farmers between \$37 and \$62 per acre thus providing a strong incentive for compliance.

Another American cross-compliance program is the "swampbuster" program^[83] which denies program benefits to farmers who planted crops on wetlands converted after 1985 or who drain or otherwise convert designated wetlands. Similarly, the "sodbuster" provisions in the *1985 Farm Bill* deny benefits to farmers who cultivate or plant a crop on any highly erodible grasslands which has not been previously cultivated.^[84] Lesser penalties are available for inadvertent violations so long as the farmer restores the damaged land.

Under swampbuster provisions, wetlands conversion is allowed if it will cause only a minimal effect on the hydrological and biological value of wetlands. This determination is made by the Soil Conservation Service and Fish and Wildlife Service. Drainage of frequently cropped wetlands is also permissible if a farmer restores previously converted wetlands of equal ecological value. Some environmental groups have been critical of minimal effect determinations and determinations of what constitutes acceptable replacement habitat.

Finally, under the Acreage Reduction Program farmers have also been required to set aside arable lands and seed it to grasses if they are to remain eligible for price supports. Under the program the size of set-asides depends on the estimates of oversupply of crops. Although the intent of this program is largely supply control rather than conservation it shows a potential for conservation set asides as a condition for eligibility for domestic support programs.

A major problem with the cross-compliance requirements is difficulty in enforcing provisions. Local committees determine whether their neighbours are properly implementing plans and may be reluctant to enforce provisions. There has also been inadequate enforcement of swampbuster provisions by local officials.^[85]

Cross-compliance Measures In Canada

Because of the importance of domestic support to the agricultural sector in Canada there is an obvious potential for linking major domestic support programs to farmers compliance with minimum environmental standards. There are approximately seventy domestic support programs available to producers in the agriculture sector in British Columbia.^[86] However, a handful of the available domestic support programs offer substantial economic support to thousands of farmers around the province. These subsidies fundamentally shape the nature of agriculture in this province and could provide an important means of fostering improved environmental standards.

Major Support Programs in British Columbia

The following are the most important domestic support programs available to producers in the British Columbia agriculture sector. Cross-compliance measures could be incorporated into these programs.

· **Net Income Stabilization Program ("NISA")**[\[87\]](#) is a federal provincial program established under the *Farm Income Protection Act*.[\[88\]](#) NISA encourages farmers to invest funds in profitable years so that funds will be available in years the farmer suffers losses.[\[89\]](#)

· **Gross Revenue Insurance Program ("GRIP")**[\[90\]](#) like NISA, is a joint federal-provincial program established under the *Farm Income Protection Act*. GRIP is a revenue insurance program in which farmers pay one third of the premium costs while the federal and provincial governments pay the other two thirds. The Ministry of Agriculture, Fisheries and Food is trying to phase out GRIP and replace it with NISA.[\[91\]](#)

· **Crop Insurance Program**[\[92\]](#) is intended to protect farmers from crop loss resulting from weather, fire, flood and wildlife.[\[93\]](#) The heavily subsidized joint federal-provincial program was established under the *Farm Income Protection Act*. There are seven crop insurance plans covering 28 commodities in British Columbia.[\[94\]](#)

· **Marketing Boards.** Milk, egg, chicken, turkey, broiler, and egg production in British Columbia is governed by marketing boards that manage supply to encourage artificially high prices. Marketing boards are established for different commodities under the *Natural Products Marketing (BC) Act*[\[95\]](#) and allocate maximum production quotas to individual farmers. Although marketing boards for poultry, and milk are permitted under the Canada-U.S. Free Trade Agreement and the Canada-Mexico Agricultural Trade Agreement,[\[96\]](#) the current round of General Agreement on Tariffs and Trade negotiations has focused on eliminating supply management regimes. It is therefore unclear whether the supply management system will continue in place for B.C. dairy and poultry industry.[\[97\]](#)

The Potential for Cross-compliance in Canada

Although cross-compliance measures have yet to be established in Canada,[\[98\]](#) the *Farm Income Protection Act*, ("*FIPA*") under which NISA, GRIP and Crop Insurance are funded, provides for cross-compliance. *FIPA* requires the Minister of Agriculture to take long-term environmental sustainability into consideration in the federal-provincial agreements which form the basis of programs under *FIPA*.[\[99\]](#) Moreover, *FIPA* requires the federal provincial agreements to set out, "the circumstances and conditions under which insurance may be withheld, restricted or enhanced for the purpose of protecting the environment and of encouraging sound management practices to ensure environmental sustainability."[\[100\]](#)

Despite the requirement in *FIPA* to establish cross-compliance measures, the federal-provincial agreement that established GRIP provided only that an environmental assessment of GRIP would be completed by April 1993, and that recommendations respecting cross-compliance measures would be made by the federal-provincial committee responsible for implementing GRIP after the completion of the assessment.[\[101\]](#) The federal-provincial agreement establishing NISA said that such recommendations would be *included* in the environmental assessment report.[\[102\]](#) The final assessments were not available at the time of printing this report.

Unfortunately, background reports which will form the basis for the environmental assessment of GRIP, NISA and the federal provincial crop insurance program[\[103\]](#) indicate that the final assessments may be of limited use in recommending effective and appropriate cross-compliance

measures. One interim report for both GRIP and NISA states that the basic objective of the assessment is not to determine if production of agricultural products covered by GRIP and NISA is being carried out in an environmentally sustainable manner, but instead it only considers whether GRIP and NISA have impacted positively or negatively on the status quo.[\[104\]](#) Also, the interim report concentrates solely on GRIP and its effects on production of grain and oilseeds. Given that GRIP and NISA were both intended to overcome the worst incentives to poor environmental practices contained in the systems they replaced, it seems unlikely that the final report will recommend effective cross-compliance measures. By asking whether GRIP and NISA have improved matters rather than asking whether they have lead to sustainable agriculture the underlying purpose of cross-compliance -- achieving sustainability -- is ignored.

Similarly, the background report for the assessment of crop insurance not only fails to answer the essential question of whether insured crops are being produced in an environmentally sustainable manner, but also fails to consider a number of submissions on crop insurance's negative environmental impacts. For instance, the report does not consider the degree to which crop insurance encourages cropping on marginal or fragile land, whether the program discourages diversification of crops, and whether it encourages increased fertilizer and pesticide use.[\[105\]](#)

A conclusion identifying GRIP and NISA as an improvement over the old domestic support system should not be taken as an indication that cross-compliance measures are not required. Cross-compliance should be attached to programs which support unsustainable activities regardless of whether they are *more sustainable* than they once were.

It is imperative that the federal and provincial governments initiate a more substantive and comprehensive environmental impact assessment of agriculture as it will be practiced under GRIP and NISA and determine appropriate cross-compliance measures. The provincial and federal governments should also consider amending legislation under which marketing boards are established[\[106\]](#) to allow for the use of cross-compliance measures as a condition of participation in marketing board systems.

Conclusions

British Columbia's use of subsidies to encourage environmentally sensitive agriculture has so far been limited in comparison to many other jurisdictions. British Columbia should explore increased use of payments to encourage environmentally sensitive management practices; payments to farmers to take sensitive land out of production; subsidies to encourage organic farming; and provision of farm infrastructure. European Community management subsidies for environmentally sensitive areas, the United States Wetlands Reserve Program, the Ontario Permanent Cover Program, the Manitoba Habitat Heritage Program, Swedish subsidies for conversion to organic farming and the Dutch Manure Law could provide models to British Columbia and the federal government.

Also, both the federal government and the province should insist that the agreements for programs such as GRIP, NISA and crop insurance set out cross-compliance measures. The legislation is already in place for doing so, and with these programs under environmental review,

the time is ripe for inclusion of cross-compliance measures. Consideration should also be given to amending supply management statutes to allow for cross-compliance in the milk, poultry and egg sectors.

However, subsidizing farmers' environmental protection measures, paying for "ecological services", and tying eligibility for farm subsidies to compliance with minimum environmental standards are only a few of the many tools that need to be used in the integration of agriculture and the environment. Other means of encouraging environmental protection within the agricultural sector include: effective land use planning which prohibits certain types of agriculture in sensitive areas, input taxes on pesticides and fertilizers, charges on excess manure, restrictions on densities of livestock in certain areas, education programs, technology improvements and restrictions on use of dangerous chemicals. Improvements in subsidies aimed at encouraging sustainable agriculture will be most effective if applied in concert with regulatory and policy initiatives.

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[1] This paper does not examine existing subsidies which may encourage poor environmental behavior. For a concise but informative summary of the relationship between subsidies and environmental degradation see the Rocky Mountain Institute Agriculture Program, *Farm Subsidies: Consequences and Alternatives*, 1992. Nor does it deal with other regulatory and policy initiatives which could be used to promote environmental protection in agriculture: stronger regulatory restrictions, input taxes on pesticides and fertilizers, charges on excess manure, education programs, technology improvements and restrictions on use of dangerous chemicals. Improvements in subsidies aimed at encouraging sustainable agriculture will be most effective if applied in concert with regulatory and policy initiatives.

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[3] Runka, G.G., *Soil Degradation and Rural Land Use Change* (Agriculture Canada and B.C. Ministry of Agriculture, Fisheries and Food, 1990).

[4] Griffiths, Angela, "The Use of Economic Instruments in Agriculture to Address Environmental Concerns" [unpublished manuscript, July 16, 1993] at 5.

[5] See Robert D. Sopuck, *Canada's Agricultural and Trade Policies: Implications for Rural Renewal and Biodiversity* (Ottawa: National Round Table on the Environment and the Economy, July 1993) at 12.

[6] See Robert D. Sopuck, *Ibid.*, at 12.

[7] *Ibid.*

[8] Liebscher, Hugh, Hii, Basil & McNaughton, Duane, *Nitrates and Pesticides in the Abbotsford Aquifer, Southwestern British Columbia*, (North Vancouver: Environment Canada, 1992).

[9] Canada, *The State of Canada's Environment* (Ottawa: Supply and Services, 1991) at 6-6.

[10] Sopuck, above at footnote 5, at 31.

[11] *Ibid.*

[12] See Agriculture Canada, *Environmental Assessment of Crop Insurance: Qualitative Assessment*, Draft Report, July 27, 1993. Canada, House of Commons, Standing Committee on Agriculture, *The Path to Sustainable Agriculture* (Ottawa: Supply and Services Canada, 1992) at 4.

[13] G.C. Van Kooten, Richard M. Porter, Richard Barichello "Institutions, Economic Incentives and Sustainable Agriculture" [unpublished manuscript, 1993] at 17. See also Canada, Agriculture

Canada, *Environmental Assessment of Crop Insurance: Qualitative Assessment* [unpublished draft, July 27, 1993] at 21 and 66.

[14] In the Fraser Valley the average storage capacity is about 3 months: Griffiths, see above at footnote 4. See also M.E. Hagen, *Agricultural Runoff Contamination in the Fraser Valley*, (Fraser River Estuary Management Program, 1990).

[15] Reductions are phased in over a number of years. See Sopuck, above at footnote 5, at 39.

[16] Sopuck, above at footnote 5, at 40.

[17] This includes subsidies such as the accelerated capital cost tax write off for pollution control equipment under the federal *Income Tax Act*, and the exemption of land devoted to pollution control in the B.C. *Property Tax Act*.

[18] There are several subsidy programs for farm producer associations. Producer group subsidies are typically aimed at funding technology transfer. For instance, the Green Plan for Agriculture provides funding for "Producer Conservation Organizations" which are created to encourage the development, evaluation, transfer and adoption of management practices and technologies that sustain soil and water productivity over the long term. Up to 80% of eligible costs will be funded to a maximum of \$40,000 per year. Similarly, the Canada-British Columbia Soil Conservation Program funds producer conservation organizations to assist in technology transfer programs and to develop public awareness projects on Sustainability in agriculture.

[19] Because of the importance of the NAWMP it is discussed separately.

[20] Catch crops are crops that absorb nitrates otherwise available for leaching.

[21] Conventional farming methods involves repeatedly tilling the soil and incorporating all plant residues. This leaves the soil surface bare and vulnerable to erosion. Tillage is used primarily as a method of weed control by exposing weed seeds. Conservation tillage refers to any form of cultivation which leaves plant residues on the surface of the soil.

[22] Agriculture Canada, *OECD Questionnaire, Agriculture and the Environment: Canada's Response*, Prepared by Agriculture Canada Environmental Bureau, June 1993.

[23] *Ibid.*

[24] *Ibid.* See also New Brunswick Department of Agriculture and Agriculture Canada, *Profarm '92: Canada-New Brunswick Cooperation Agreement on Agri-Food Development* (1992) at c-112.

[25] de Haen, H., H.F. Fink, C. Thoroe & W. Wahmhoff, "Impact of German intensive crop production and agricultural chemical policies in Hildesheimer Borde & Rhein-Pfalz," ed. by Michael D. Young in *Towards Sustainable Agricultural Development* (London: Belhaven Press, 1991) at 18. The Act also places levies on certain agricultural practices.

[26] *Ibid.*, at 19-20.

[27] Organization for Economic and Co-operative Development, *Agricultural and Environmental Policies: Opportunities for Integration* (Paris: OECD, 1989) at 107.

[28] Under the Cereals and Game Birds project.

[29] A. Korbey (ed.), *Food Production and our Rural Environment: The Way Ahead* (Reading: University of Reading, Centre for Agriculture Strategy, 1985) at 31.

[30] Organization for Economic Cooperation and Development, above at footnote 27, at 144.

[31] These are discussed below at footnotes 74 to 76.

[32] Organization for Economic and Co-operative Development, *Agricultural and Environmental Policy Integration: Recent Progress and New Directions* (Paris: OECD, 1993) at 61.

[33] EC Regulation 797/85, Article 19; Organization for Economic Cooperation and Development, *Ibid.*, at 58.

[34] *Ibid.*

[35] Organization for Economic Cooperation and Development, *Reforming Agricultural Policies: Quantitative Restrictions on Production and Direct Income Support* (Paris: OECD, 1990) at 62.

[36] Hanley, N., "The Economics of Nitrate Pollution Control in the U.K.," in *Farming and the Countryside: An Economic Analysis of External Costs and Benefits* (London: CAB International, 1991) at 59.

[37] At footnote 53.

[38] Foster, I. & B. Ilbury, "Water Protection Zones: A Valid Management Strategy?" ed. by A.W. Gilg in *Restructuring the Countryside: Environmental Policy in Practice* (Oxford, U.K: Avenbury Studies in Green Research, 1992) at 209.

[39] *Ibid.*, at 208.

[40] Organization for Economic Cooperation and Development, above at footnote 32, at 92.

[41] This is discussed below at footnote 57.

[42] Reichelderfer, Katherine H. "Environmental Effects of Farm Programs in Developed Countries" in *Sustainable Agriculture: Its Policy Effects on the Future of Canada and Ontario's Agrifood System*, Proceedings of a Conference Sponsored by The George Morris Centre,

University of Guelph, Ontario, May 1990 at 40; D.J. Briggs & E. Kerrell, "Patterns and Implications of Policy Induced Agricultural Adjustments in the European Community," ed. by A.W. Gilg, in *Restructuring the Countryside: Environmental Policy in Practice*, (Oxford, U.K: Avenbury Studies in Green Research, 1992) at 92 and 99.

[43] Marginal land is defined under the program as land classified as Class 4 or higher under the Canada Land Inventory System. This constitutes about 15% of cultivated land on the Prairies. See Agriculture Canada, above at footnote 22.

[44] Based on July 1992 actual and projected figures: Agriculture Canada above at footnote 22, and Prairie Farm Rehabilitation Association, *Potential Impact of Permanent Cover Programmes on Federal Government Expenditures* [Draft Paper, Saskatoon: PFRA Policy Analysis Service, 1992] at 25.

[45] Agriculture Canada, above at footnote 22.

[46] Land Management Assistance Program. See above at footnote 22 and accompanying text.

[47] This is budget for 1993-94 fiscal year: See Agriculture Canada, above at footnote 22.

[48] The information of the Conservation and Wetlands Reserve Programs is taken from World Wildlife Fund, *Statewide Wetlands Strategies: A Guide to Protecting and Managing the Resource* (Washington, D.C.: Island Press, 1992); Organization for Economic Cooperation and Development, above at footnote 32, at 64; Mladen, Michael J., "The Use of Economic Instruments to Enhance Environmental Protection in British Columbia: Selected Legal and Jurisdictional Issues," [unpublished manuscript, August 1993]; Council on Environmental Quality, *Environmental Quality: 23rd Annual Report of the Council on Environmental Quality* (Washington, D.C.: U.S. Government Printing Office, 1993); Organization for Economic Cooperation and Development, above at footnote 27, at 115.

[49] 16 U.S.C. art. 3830-3837 (Supp. 1991).

[50] From 21 to 2 tons per acre per year.

[51] Sopuck, above at footnote 5, at 41.

[52] These reports were not available to the public as of November 1, 1993.

[53] Organization for Economic Cooperation and Development, above at footnote 32, at 64; I. Foster & B. Ilbury, above at footnote 38, at 209.

[54] Organization for Economic Cooperation and Development, *Ibid.*, at 19-20.

[55] *Ibid.*, at 62.

[56] Cox, Kenneth, *Wetlands: A Celebration of Life*, Final Release of the Canadian Wetlands Conservation Task Force (Ottawa, North American Wetlands Conservation Council (Canada), 1993) at 52.

[57] McKeating, Gerald, "The North American Waterfowl Management Plan: An Example of National and International Cooperation and Resource Management," ed. by Monique Ross & J. Owen Saunders in *Growing Demands on a Shrinking Heritage: Managing Resource Use Conflicts* (Calgary: Canadian Institute of Resources Law, 1992) at 250.

[58] Manitoba, *Financial Assistance Programs Available to Manitoba Farmers* (Winnipeg: Manitoba Agriculture, 1992) at 29.

[59] See R. Gray, "An Analysis of the Prairie Habitat Joint Venture Initiatives on Prairie Agricultural Subsidy Requirements," (1992) as cited in Sopuck, above at footnote 5, at 41.

[60] See Kenneth Cox, above at footnote 56; Alberta Water Resources Commission, *Wetland Management in the Settled Areas of Alberta* (Edmonton: Alberta Water Resources Commission, June 1990) at 25 to 26.

[61] Personal communication with Theresa Duynstee, Ducks Unlimited, Greenfields Project Coordinator.

[62] In areas heavily used by widgeon ducks there is no limit as to acreage for which farmers can be reimbursed; farmers non-high use areas are limited to enrolling 50 acres in the plan. From Duynstee, *The Greenfields Newsletter*, Volume 1, Number 4, July 1992.

[63] van Kooten, Porter & Barichello, above at footnote 13, at 29.

[64] See above text accompanying footnote 23.

[65] This information was taken from ALDA "Info Sheets" provided by the B.C. Ministry of Agriculture, Fisheries and Food and from Agriculture Canada's *Government Programs Available to the B.C. Agri-Food Sector*, 1991.

[66] The maximum loan is \$75,000; the minimum loan is \$5,000. The interest rate is set at one half the average chartered bank rate for the previous six month period. The minimum interest rate on all ALDA Program loans is 4%.

[67] Agriculture Canada, above at footnote 22.

[68] The research and development arm of the B.C. Federation of Agriculture.

[69] These include the *Code of Agricultural Practice for Waste Management* under the *Agricultural Waste Control Regulation*, B.C. Reg 131/92.

[70] Agriculture Canada, above at footnote 22.

[71] *Ibid.* See also New Brunswick *Profarm '92*, above at footnote 24.

[72] *Ibid.*

[73] Organization for Economic Cooperation and Development, above at footnote 32, at 52.

[74] Organization for Economic Cooperation and Development, above at footnote 32, at 54.

[75] Organization for Economic Cooperation and Development, above at footnote 32, at 60.

[76] Organization for Economic Cooperation and Development, above at footnote 32, at 61.

[77] Jenkins, T.N., *Environmental Approaches to Farm Support Policy in the E.C.* [University College of Wales, manuscript].

[78] See Debbie Sivas, "Groundwater Pollution from Agricultural Activities: Policies for Protection" (1988), 7 *Stanford Environmental Law Journal* 117, for a discussion of using subsidies to encourage implementation of best management plans for groundwater protection.

[79] Sivas, *Ibid.*, notes that, although monitoring is still a necessary component of subsidy systems oversight of these programs would probably be easier than enforcement of pure regulatory directives.

[80] GATT Secretariat, *Draft Final Act Embodying The Results of the Uruguay Round of Multilateral Trade Negotiations*, GATT document MTN.TNC/W/FA, December 1991 (known widely as the Dunkel Text).

[81] *Food Security Act of 1985*, above at footnote 49.

[82] Hallberg, M.C., *Policy for American Agriculture: Choices and Consequences* (Iowa: Iowa State University Press, 1992).

[83] 16 U.S.C. art 3821 - 3824 (Supp. 1991).

[84] Information on the swampbuster and sodbuster programs is taken from the following sources: World Wildlife Fund, above at footnote 48, at 96 et seq.; J.A. Miranowski, J. Hrubovcak, & J. Sutton, "The Effects of Commodity Programs on Resource Use," ed. by R.E. Just and N. Bockstael in *Commodity and Resource Policies in Agricultural Systems* (Berlin: Springer-Verlag, 1991) at 275.

[85] van Kooten, Porter and Barichello, above at footnote 13, at 18.

[86] See Agriculture Canada *Government Programs Available To The B.C. Agri-food Sector* Queen's Printer, 1991; and the B.C. Food Group *Access: Your Key to Government Programs and Services for the Food Industry in British Columbia* Queen's Printer, 1992.

[87] Information in this section was taken from brochures of the NISA Administration Office. The brochures are titled: "NISA: Questions and Answers" and "NISA: Individual Instruction Guide".

[88] S.C. 1991 c.22.

[89] Farmers' contributions of up to 2% of their eligible net sales into a NISA account are matched by federal and provincial contributions. The farmers contributions receive higher than normal market interest rates. Presently NISA is available to producers of virtually all grains, oilseeds, fruits and vegetables. It is not currently available to producers of livestock or producers of feed for livestock; however, the provincial Ministry of Agriculture, Fisheries and Food intends to extend NISA to cover all agricultural production in the province. The federal and provincial governments match the farmer's contribution by each contributing an amount equal to 1% of the farmer's net sales. The farmer's 2% will gain interest at a rate 3% higher than competitive rates.

[90] Information on GRIP was taken from a jointly sponsored government brochure titled "Canada-British Columbia Revenue Protection Plan Handbook for Grains and Oilseed".

[91] Currently only wheat, barley, canola and oats are eligible for GRIP.

[92] Information in this section was taken from a brochure produced by the B.C. Ministry of Agriculture, Fisheries and Food. It is titled: "What You Must Know About Crop Insurance".

[93] Insurance for losses from waterfowl has been important in increasing farmer support for wetland restoration programs and discouraging drainage of wetlands: Alberta Water Resource Commission, *Wetland Management in the Settled Area of Alberta*, (Edmonton: Alberta Water Resources Commission, 1990) at 27-8.

[94] Plans exist for Berries, Forage, Grain, Grapes, Honey, Tree Fruit, and Vegetables. The plans work as follows: 1) The farmer's "production guarantee" is calculated based on the farmer's historic average production, acreage, and the amount of coverage he or she wants. 2) The dollar-amount for which the farmer is covered equals the "production guarantee" multiplied by the current market unit value of the crop. 3) The amount which a farmer is paid equals the production guarantee minus the harvest all multiplied by the unit value of the crop. The premium rate differs from farmer to farmer depending on the amount of risk involved in the crop, but the provincial and federal governments each pay 25% of the premium cost, leaving the farmer to pay 50%.

[95] R.S.B.C. 1979, c. 296.

[96] The Canada-United States Free Trade Agreement does, however, increase the import quota for poultry and eggs.

[97] "GATT threatens supply management" Globe and Mail, December 6, 1993 at A-1.

[98] It should be noted that some observers have described Alberta's livestock insurance program as having a cross-compliance measure. Provincial compensation is refused where management practices are considered to have contributed to livestock losses. See Canada, House of Commons, Standing Committee on Agriculture, *The Path to Sustainable Agriculture* (Ottawa: Supply and Services, 1992). Since the subsidy (compensation for loss of livestock) is directly tied to the condition of coverage (livestock management which avoids loss) this program is less a cross compliance measure than a condition of eligibility.

[99] Subsection 4(2).

[100] Section 5(2)(a).

[101] GRIP Agreement, s.19.1 to 19.3, Schedule C, section 1 and *FIPA* s. 5(3).

[102] Federal/Provincial Agreement Establishing The Net Income Stabilization Account Program, s. 6.7.

[103] Kraft, D., *Draft Environmental Assessment of GRIP and NISA: Draft Interim Report Number 4*, (Calgary: Environment Management Associates, January 1993); Agriculture Canada, *Environmental Assessment of Crop Insurance: Qualitative Assessment*, Draft Report July 27 1993. This qualitative assessment will form one of four appendices to the final assessment. The final crop insurance and NISA assessments were not available at the time of writing. The environmental assessment of GRIP was completed in October 1993, but at time of writing this draft was not yet available to the writers of this report.

[104] The report states that "This assessment will not provide a definitive answer to the question of whether the production of grains and oilseeds in Canada is environmentally sustainable; rather, it will assess whether GRIP/NISA-induced changes are a stabilizing or de-stabilizing influence on selected components of agro-ecosystems and the broader environment."

[105] See Appendix B to Agriculture Canada, *Environmental Assessment of Crop Insurance*,

[106] The *Natural Products Marketing (B.C.) Act*, R.S.B.C. 1979, c. 296, the *Agricultural Products Marketing Act*, R.S.C. 1985, c. A-6; the *Farm Products Marketing Agencies Act*, R.S.C. 1985, c. F-4; the *Canadian Dairy Commission Act*, R.S.C. 1985, c. C-15. None of these Acts provide marketing boards or government with the power to establish cross-compliance measures. Cross-compliance measures would need to be established by regulations passed by cabinet rather than marketing board regulations as marketing boards are generally producer dominated and would have little reason to set high standards. Cross-compliance measures for marketing boards would require procedural safeguards to ensure their fair application. Otherwise, they would likely be seen as draconian given the high price paid for quotas and the fact that quotas are mandatory for any producers. In other words enforcement of cross-compliance measures for marketing boards would mean potential loss of livelihood and loss of valuable property.