

## **4. ACTUAL AND POTENTIAL AGRI-ENVIRONMENTAL BENEFITS**

### **4.1 Introduction**

Many jurisdictions around the world have implemented voluntary agri-environmental programs to encourage farmers to undertake best management practices or other environmentally-friendly activities on their land. This section draws from all jurisdictions and groups these benefits according to the most common areas of concern. It is not yet an exhaustive treatment.

Section 8: Agri-Environmental Indicators and Monitoring, describes the function of agri-environmental indicators as a measure of the state of the agri-environment and their use in evaluating the outcome of incentive programs. There are obvious similarities between environmental benefits and these indicators and the two are evidently merging as the problems are systematically identified and addressed.

### **4.2 Agri-Environmental Benefits by Category**

Until recently, agri-environmental incentive programs in Ontario have concentrated on conservation of soil and water resources. Therefore, programs have dealt heavily with what might be called best management practices. Ontario has more recently added to this basic resource emphasis. New orientations will seek to include air quality, biodiversity, health issues and related environmental concerns.

- Soil
- Water
- Air

- Health/Environmental Benefits
- Biodiversity and Conservation (Wildlife and Habitat)
- Other Landscape and Amenity Benefits
- Combined Benefits
- Extensification
- Related Incentives; programs which may indirectly provide benefits

The European Union (EU) has a particularly wide range of incentive programs since their planning policy and regulations are now linked to broad environmental and rural development interests which include cultural values attached to the landscape amenity. These European programs are reported by Potter (1998b) based on De Putter's work.

The United States also has many agri-environmental incentive programs, but their orientations are quite different from European regulations.

## **Soil:**

### **Land Retirement:**

- permanent retirement of fragile or ecologically important land is used in both US and EU as a conservation mechanism, especially in the Conservation Reserve Program (CRP) under the US farm bill amendment process which will enhance this form of subsidy.

### **Crop Residue and Strip Tillage:**

- leaving crop residue in the fields helps prevent soil erosion;
- leaving narrow bands of residue as strip tillage to overcome the problem of cold soils in spring from the insulating effect of the residue;
- performance warranty; see American Farmland Trust's Research Centre for Agriculture in the Environment website for project description using a performance warranty by the agency to reduce risk of financial loss if the strategy fails. A mutual risk pool for possible loss recovery has also been devised.

### **Water:**

#### **Improving Water Quality by Optimising Fertilizer Use:**

- through precision farming (see Glossary; American Farmland Trust's Research Centre for Agriculture in the Environment website for project description);
- application of inputs is optimised by using a Geographic Information System or Geo Positioning Device (related to precision farming).

#### **Fencing of Livestock from Streams:**

- stream buffers are often used in conjunction with fencing to restrict livestock from surface waters. This prevents direct pollution from

individual animals and also prevents erosion of stream banks and river bed.

## **Air:**

### **Air Quality:**

- odour or contamination from e.g. manure handling;
- air pollution deriving from dust or agri-chemicals.

### **Greenhouse Gas Emissions:**

- abatement of greenhouse gas emissions, especially of methane, from livestock operations;
- carbon sequestration in the soil or biomass for the reduction of CO<sub>2</sub> as a greenhouse gas. There is some current discussion about integrating carbon sequestration into incentive programs in connection with the Kyoto Accord on Climate Change.

## **Health/Environmental Benefits:**

### **Integrated Pest Management (IPM)(see Glossary):**

- certain practices within IPM provide a form of environmental “goods and services.” See American Farmland Trust’s Research Centre for Agriculture in the Environment website for projects where IPM is referred to in this context;

- reduction of chemical inputs and pollution control ;
- organic farming.

## **Biodiversity and Conservation (Wildlife and Habitat):**

### **Wetlands Establishment, Remediation or Rehabilitation:**

- farmers who convert wetlands pay other farmers in their watershed area to restore wetlands; the restorers receive funding – a form of trading;
- American Farmland Trust’s Research Centre for Agriculture in the Environment website for descriptions for purposes of habitat conservation or pollution cleanup from e.g. farm wastewater;

## **Other Landscape Amenities:**

- landscape and countryside management;
- rearing of local breeds in danger of extinction;
- upkeep of abandoned farmland or woodland;
- public access and leisure.

## **Combined Benefits:**

### **Sustainable Agricultural Practices (see Glossary):**

- expansion of cover crops;
- diversification of crop type;
- reduction of purchased agricultural inputs, pesticides;

- greater reliance on natural processes.

**Planting of Windbreaks/Shelter Belts:**

- controls wind erosion;
- increases biodiversity;
- increases wildlife habitat;
- provides for visual amenity;
- reduces heating/cooling costs for the farmstead.

**Riparian Buffer Strips or Zones (see Glossary):**

These serve a number of functions and therefore have combined benefits:

- bank erosion control;
- capture of soil eroded from flow over bare soil;
- immobilizes or takes up fertilizers/pesticides dissolved in surface water and groundwater which would otherwise flow into the stream;
- provides habitat and increases biodiversity (both within the buffer and along the stream bank);
- possibly enhances the scenic landscape amenity;
- when treed, riparian buffer zones lower the water temperature of streams to the benefit of certain native fish species.

**Other Buffer Strips or Zones:**

- buffer strips can be used in areas apart from watercourses and offer some of the same benefits. When treed, they offer a separating buffer or screen for farm activities.

**Environmental practices:**

- unspecified European terminology.

### **4.3 Private Conservation or Stewardship Mechanisms**

Reid and Hiltz (1990), among others, give some of the many mechanisms by which private landowners can implement conservation projects on their land or dedicate their property or portions of it to conservation uses. This is not generally part of the language of the agri-environment since they are removed from the commercial exploitation of the land resource for agriculture. Some of those listed below may, however, be integrated into the US farm bill's conservation programs:

- land trusts;
- conservation easements;
- heritage conservation.

Ducks Unlimited's SWIPE program contains a number of recommendations for private land stewardship or best management practices. Those not already mentioned above include:

- rotational grazing;

- field layout for continuous cover of sides and headlands, with nutrient trading in exchange for hay;
- on-farm environmental monitoring by sampling;
- forested wetland protection and management.

### **Extensification**

This is European terminology for the deliberate reduction in intensity of agriculture. It is used as the opposite of intensification\* and includes activities such as:

- convert arable into grassland;
- reduction of livestock density.

### **Related Incentives:**

Targeted private-sector risk insurance for farmers adopting certain conservation practices. See American Farmland Trust's Research Centre for Agriculture in the Environment website for project description.

### **Set-aside:**

- land set-aside is used in the EU as a temporary measure to reduce overproduction. It is not the same as land retirement, which is a conservation measure;
- twenty-year set-aside;
- training and demonstration projects.