

Agriculture and the Environment In the United States and EU

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Introduction

Agriculture is more than just the production and sale of commodities; it also produces many intended and unintended positive and negative by-products. Negative by-products, or disamenities, include nutrient and pesticide run-off, soil erosion, air pollution, and the loss of biodiversity (ERS 2000). The positive by-products, or amenities, provided by agriculture can be relatively tangible goods such as open space and scenic vistas, while others, such as the spiritual or symbolic value of preserving our farming heritage, are more abstract and nonpecuniary (Mullarkey, Cooper, and Skully). Many environmental amenities or disamenities of agricultural production affect society as a whole and have a social benefit or cost much greater than the private benefit or cost affecting those involved in agriculture. In such cases, there is an economic rationale for the government to subsidize the environmental amenity (or tax an environmental disamenity) to produce the desired level of environmental protection. Indeed, both the United States (U.S.) and the European Union (EU) employ a series of Federal and State agri-environmental programs to encourage both the provision of environmental amenities and the reduction of environmental disamenities associated with agriculture.

While there has been a long history of agri-environmental programs in the United States and the EU, such programs began to play a larger role in Federal farm policies during the 1980s, at least in part due to greater concern about the environmental damage resulting from agricultural production. Since that time, agri-environmental programs have increased in their importance and will likely continue playing a vital role in future EU and U.S. farm policy debates. Both the United States and EU use a mixture of three types of programs to address agri-environmental issues: volun-

tary incentive-based programs, regulatory programs, and cross-compliant programs.

Different Instruments of Environmental Protection

Agri-environmental policy in the United States and the EU generally consists of a combination of voluntary instruments (incentives or subsidies) and involuntary instruments (taxes and regulatory requirements) in order to promote the use of environmentally sound farm practices.¹ Cross-compliance is another agri-environmental policy instrument that is sufficiently different from the instruments above to merit a separate discussion in this section.

Agri-environmental taxes are per-unit charges (either on an emission or on an input) designed to serve as a disincentive for using environmentally damaging practices. Total tax payments depend on the farmer's behavior; the further from the environmental goal, the higher the payment. The advantages of environmental tax policies are that they are consistent with the "polluter pays" principle, which argues that the public owns environmental resources and those who pollute these resources must pay compensation to the public (Krissoff et al.). In addition, taxes do not promote expansion of environmentally damaging activities. On the other hand, taxes have a negative impact on farm income. Taxes do not play a significant role in the agri-environmental policies of either U.S. Federal policy or EU-wide policy.

Agri-environmental incentives are payments to the farmer to adopt environmentally sound practices or to retire environmentally sensitive land from production. The advantage of incentives, such as those sharing the

¹Only a brief overview is provided here; for a more detailed overview of the economic instruments pertaining to U.S. agri-environmental policy, see Claassen et al., (2001).

costs of adoption of environmentally benign management practices or paying farmers to set aside land, is that they increase the likelihood that farmers will adopt the desired practices or retire land. The disadvantage of incentives is that achieving desired levels of adoption of environmentally benign management practices or of land retirement with them may be costly for taxpayers. Incentives can also have the effect of expanding production by the farm, or increasing entry into the sector, so even if the disamenities produced by each farm (or on each field) decrease, more farms (or fields) now produce disamenities.²

Regulatory requirements, or standards, represent involuntary (or mandatory) participation approaches that establish standards that all targeted actors must adhere to. The ban on the production and application of the chemical DDT is one such example. Unlike policy choices in which farmer participation is uncertain, regulations simply require that all farmers participate. This feature is particularly important if the consequences of not changing practices are drastic or irreversible. On the other hand, regulatory requirements are a blunt tool and can be the least flexible of all policy instruments, requiring that producers reach a specific environmental goal or adopt specific practices. Producers are not free to determine their own level of participation, based on their costs. Unless regulators know farm-specific costs (which is unlikely) and can use this information to establish farm-specific regulations, agri-environmental effort is not necessarily directed toward producers who can make changes (achieve gains) at the lowest cost. Consequently, regulation can be less flexible and less efficient than economic incentives such as taxes and subsidies. Regulatory requirements receive less prominence than other instruments within traditional agri-environmental policy in both the EU and the United States, but the regulatory environment is becoming increasingly complex.

Cross-compliance requires a basic level of environmental compliance as a condition for farmer eligibility for other government programs that farmers may find economically desirable, such as those that provide producer payments. Technically, cross-compliance is a voluntary, indirect incentives-based instrument, but as

²According to Baumol and Oates, a firm that would be unprofitable under a tax may be made profitable by an incentive (subsidy). While a tax may drive a firm out of a competitive industry and so generally lead to a decrease in its output, an incentive may increase entry and induce expansion in competitive outputs.

it represents a standard for receiving a subsidy, in practice it may not strictly be perceived as voluntary, particularly when the existing subsidy represents an important share of total farm income. It may be difficult for a farmer to forego cross-compliance when the value of the existing subsidies exceed the farmer's costs of adopting the mandated practices.³ In this circumstance, loss of these payments is dramatically different from foregoing an *additional* subsidy that is offered as compensation for adopting conservation practices. An advantage of cross-compliant programs is that less government outlay is required than with subsidies to address environmental problems. Disadvantages are that it will have lower capacity for impact on farms that are not traditional clients of Federal farm payment programs or in situations when program payments are low.⁴ Also, the administration of cross-compliance programs may require intergovernmental coordination of programs with divergent goals.

While some agri-environmental instruments tend to be more cost-effective than others in producing environmental benefits, the cost-effectiveness of any specific program depends greatly on the details of implementation.⁵ For example, significant variation in climate, soils, crops, and proximity to environmental resource (e.g., rivers or lakes) means that the ability to produce environmental benefits (or reduce environmental damage) can vary widely among farms, particularly in a national program. Highly erodible soils, located near a major river in an area of high rainfall intensity, are likely to deliver significantly more sediment to the river than less erodible land located farther from the river or in an area

³In recent years, government payments have accounted for a large share of farm income, particularly in grain-producing States. Moreover, farm commodity programs have been in place for sufficient lengths of time in both the EU and the United States--more than 65 years in the United States--that payments are largely capitalized into the value of land (Barnard *et al.*, 1997; Duffy *et al.*, 1994) and are generally built into producers' financial calculations. For many producers, the ability to purchase land or pay cash rent depends significantly on farm program payments.

⁴Cross-compliance requires levels of monitoring and enforcement that are adequate to ensure environmental compliance. Of course, the other programs discussed here may also require monitoring and enforcement to ensure that the farmers adopt the desired practices. However, the costs of monitoring and compliance may vary across types of programs. For instance, land retirement may be easier to verify than adoption of particular farm management practices.

⁵See Claassen *et al.*, (2001) for a more detailed discussion of these issues.

of lower rainfall intensity. The cost-effectiveness of specific policy instruments can vary widely depending on the extent to which this type of variation is recognized and accommodated within the program. This and other potential variations in implementation (e.g., the level of flexibility accorded producers) make it difficult to rank the cost-effectiveness of instruments irrespective of other program details.

In practice, however, both the United States and EU use environmental programs to support farm prices, incomes, or both, as well as increase environmental amenities or reduce pollution. Agri-environmental policies often have the dual objective of environmental protection and farm income support, at least implicitly. The fact that some agri-environmental policies are trying to fulfill the twin objectives, in part, explains their structure.

U.S. Agri-environmental Policy

“U.S. Agri-Environmental Programs” lists major U.S. agri-environmental policies (ERS, 2000; Claassen et al., 2001). Nearly all agri-environmental programs authorized under the 1996 FAIR Act were continued and many received large funding increases in the 2002 Farm Act. Several major new programs were also established. Overall, conservation funding is slated to increase by 80 percent with the 2002 farm bill.⁶

Major U.S. agri-environmental programs can be categorized as either incentive programs or cross-compliance mechanisms. Environmental incentive programs can be further categorized.

- **Land retirement** programs remove land from crop production. In exchange for retiring land, producers receive rental or easement payments plus cost sharing and technical assistance to aid in the establishment of permanent cover. Economic use of the land is limited.
- **Working land conservation** programs support adoption and maintenance of land management and structural conservation practices on agricultural land, including cropland, grazing land, and in some cases, forestland, in exchange for cost-shares or incentives.
- **Agricultural land preservation** programs help retain land in agricultural production by purchasing the right to convert land to other uses.

⁶See ERS (2002) for more details on policy changes in the 2002 Act.

Finally, a number of regulatory programs affect agriculture, but are generally originated outside of the House and Senate Agriculture Committees in Congress and are primarily concerned with non-agricultural industries. For a discussion of regulatory programs in agri-environmental policy see Claassen et al., (2001).

Land Retirement. The Conservation Reserve Program (CRP) offers annual payments and cost sharing to establish long-term, resource-conserving cover on environmentally sensitive land. Contracts are for 10 to 15 years. Economic use of the land is limited during the contract period, but landowners retain the right to return land to crop production at the end of the contract. The Wetlands Reserve Program (WRP) provides cost sharing and long-term or permanent easements for restoration of wetlands on agricultural land. Landowners retain land ownership and rights to recreational uses, such as hunting and fishing.

Land retirement has dominated Federal agricultural conservation spending since 1985 (fig. 1). Roughly 50 percent of all USDA conservation spending since 1985 has been for land retirement. About 10 percent of U.S. cropland--nearly 35 million acres--is currently enrolled in a Federal land retirement program, largely through CRP (33.8 million acres). The 2002 Act expands the CRP acreage cap to 39.2 million acres, while the WRP acreage cap is more than doubled, from 1.075 to 2.275 million acres.

Land retirement programs have lowered U.S. agricultural production, resulting in higher prices for commodities such as wheat, corn, and soybeans. According to a study conducted by the Farm Service Agency (cited in ERS (2000), chapter 6.2), the combination of higher commodity prices and land retirement payments have increased farmer income more than any loss of income due to non-production on unused land. Increases in farm income have also exceeded the increase in consumer expenditure due to higher commodity prices. Land retirement programs have been shown to have positive environmental effects on soil productivity, water quality, and air quality but these effects are small compared with the effects on farm income and consumer expenditure (ibid).⁷ Besides these impacts, land retirement programs have the added benefit of being relatively easy to implement

⁷However, it should be noted that monetary values of only a subset of environmental impacts have been estimated.

U.S. Agri-Environmental Programs (administered by the USDA)¹

Voluntary Programs

- Environmental Quality Incentives Program (EQIP)—Through use of technical assistance, education, cost-sharing, and incentive payments, EQIP assists farmers and ranchers in adopting land management and structural practices that improve environmental performance.
- Conservation Security Program (CSP)—Provides payments to farmers in return for their use of a wide range of environmentally-benign land management practices. The program has three “tiers” for participation; with higher tiers requiring greater conservation effort and offering larger payments. Existing practices can be enrolled. This program is new under the 2002 Farm Bill.
- Wildlife Habitat Incentives Program (WHIP)—Similar to EQIP but aims to protect wildlife habitats.
- Conservation Reserve Program (CRP)—Provides rental payments to agricultural producers who retire environmentally sensitive cropland for 10 to 15 years.
- Wetland Reserve Program (WRP)—Assists landowners in restoring wetlands on agricultural land through easement payments and restoration cost sharing.
- Conservation Technical Assistance (CTA)—Provides technical assistance to farmers and ranchers who implement soil and water conservation and water quality improvement.
- Farmland Protection Program (FPP)—Allocates funds for purchase of conservation easements and other types of interest in land with prime, unique, or other highly productive soils. The new version of FPP under the 2002 Farm Bill receives a 20-fold increase in funding and extends eligibility to land with “historically important land areas and structures.”

¹For an in-depth description of U.S. agri-environmental programs and related expenditures, see ERS (2000) and ERS (2002).

- Emergency Conservation Program (ECP)—Provides financial assistance to farmers who conserve water while recovering from natural disasters such as severe drought.
- Grassland Reserve Program (GRP)—Using contracts or easements in conjunction with compensatory payments, up to 2 million acres of grassland will be protected from conversion to other uses.

Regulatory Programs²

- Clean Water Act (CWA)—Operators may be subject to effluent discharge permits if CWA standards are not met.
- Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)—Uses restrictions and bans on certain pesticides.
- Endangered Species Act (ESA)—Under ESA, farmers may not “take a member” (e.g. reduce the population) of a listed species.
- Clean Air Act—The use of methyl bromide, a fumigant, is largely being phased out under this act.

Cross-compliance Programs

- Conservation Compliance—Introduced in the 1985 Farm Bill, conservation compliance requires conservation systems on previously cropped highly-erodible land (HEL) as a condition of eligibility for certain Federal farm programs, including farm price and income support.
- Sodbuster—Producers who bring HEL into production must apply strict soil conservation systems to be eligible for farm programs.
- Swampbuster—Producers who covert wetland for agricultural production can lose Federal farm program payments.

²These programs are not administered by the USDA.

and enforce since land retirement can be easily confirmed.

Working Land Conservation. The Environmental Quality Incentives Program (EQIP) provides technical assistance, cost sharing, and incentive payments to assist livestock and crop producers with adoption of a wide range of environmentally benign production

practices, or best management practices (BMPs). The Wildlife Habitat Incentives Program (WHIP) provides cost sharing to landowners and producers to develop and improve wildlife habitat. The new Conservation Security Program (CSP) will provide payments to producers for maintaining or adopting a wide range of structural and land management practices that address a variety of local and/or national resource concerns.

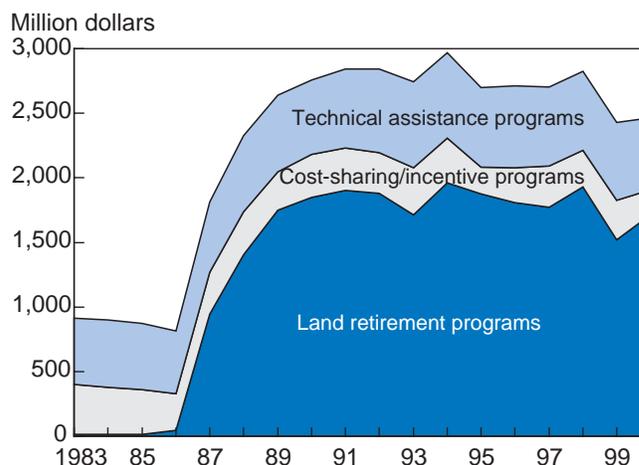
CSP could fund the installation and/or maintenance of the same types of practices funded under EQIP, with the notable exception of livestock waste handling and storage facilities, which may be funded under EQIP, but not under CSP. Finally, USDA also provides conservation technical assistance (CTA) to producers who adopt agri-environmental BMPs outside of other USDA conservation programs.

In the past, funding for working land conservation has been modest in comparison with land retirement (fig. 1-F). The 2002 Act provides a large increase in these programs, relative to increases for land retirement (fig. 2-F). EQIP is slated to receive \$5.8 billion over the 6 years of the 2002 Farm Bill (2002-07), an average of \$966 million per year, nearly five times the \$200 million annual funding authorized by the 1996 FAIR Act. The CSP could receive up to \$3.8 billion over the next 10 years, although the Congressional Budget Office (CBO) estimated that CSP will spend only \$987 million through fiscal year 2007 (the end of the 2002 Act).

Because working land programs are generally quite flexible when compared with land retirement, this change in funding may lead to a broader array of options and greater flexibility for producers in meeting the requirements of the program. Namely, working land programs may represent a large suite of management practices the farmer can choose from in building a conservation plan, while land retirement essentially represents to the farmer a choice between keeping the land in production or not. Greater flexibility allows producers to develop conservation strategies that are tailored to their own climate, soils, and management skills, potentially delivering agri-environmental gains at a lower cost. In EQIP, for example, producers can choose from a wide range of conservation practices in developing a conservation plan. Plans can include both land management practices such as nutrient management or conservation tillage and structural practices such as waste storage/handling systems, grass waterways, and filter strips. EQIP contracts can be as little as 1 year or as long as 10 years in length.

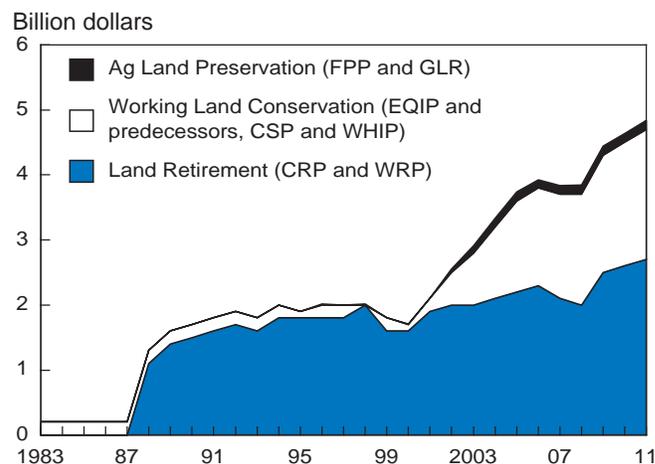
Perhaps the biggest innovation of the 2002 Act is the creation of the CSP. A key difference between this program and existing agri-environmental programs, such as EQIP, is that under CSP, agri-environmental payments for specific environmentally benign best management practices (BMPs) would be available to

Figure 1-F
U.S. conservation expenditures by program type, 1983-2000



Source: USDA.

Figure 2-F
Conservation expenditures by program type, 1983-2001, with projections to 2011



Sources: Office of Budget and Policy Analysis, USDA, and the Congressional Budget Office.

farmers who implement such practices prior to enrolling in the program. Specifically, CSP will offer payments to farmers who have already installed or are already using conservation practices as well as to those who will adopt them upon entry into the program. Farmers could receive a payment based on land rental rates (5-15 percent of land rental rates, depending on the level of conservation effort) and cost-sharing for ongoing BMP maintenance. In this sense, CSP will be more than a cost-share program and is essentially a U.S. analog to several types of EU agri-environmental subsidies allowed under EC

Reg. 2078/92. Although the details are still being worked out, CSP will have three “tiers” for participation, with each successive tier requiring greater conservation effort and offering larger payments. The upper bound on total payments per farm is \$45,000. To reduce the possibility that this program will promote an expansion of farmed acreage, cropland will be eligible for CSP only if farmed 4 of 6 years prior to 2002.

Agricultural Land Preservation. The Farmland Protection Program (FPP) funds purchases of development rights on agricultural land in urban fringe areas, preserving it for agricultural production. Projected over 10 years, FPP is slated to receive funding of \$985 million--a nearly 20-fold increase over the \$53.4 million provided between 1996 and 2001. Under the new Grassland Reserve Program (GRP) producers can enter long term contract or easement agreements to maintain grassland for grazing and/or haying.

Compliance Mechanisms. With the exception of a handful of regulatory requirements, cross-compliance programs represent the most demanding environmental requirements for U.S. farmers. Introduced in the 1985 Act, compliance mechanisms require farmers with environmentally sensitive land to adopt certain resource conservation activities in order to be eligible for Federal agricultural payments, such as commodity loans and direct and counter-cyclical payments. Under wetland conservation provisions, widely known as “swampbuster,” agricultural producers can lose Federal farm program benefits if they convert wetlands to make agricultural production possible. Producers may also lose benefits if they produce crops on highly erodible land (HEL) without applying an approved conservation system. For highly erodible land that was cropped before enactment of cross-compliance requirements, producers must actively apply conservation systems designed to “substantially” reduce soil erosion. These provisions are widely referred to as “conservation compliance.” For HEL not cropped prior to compliance requirements, producers must meet a more stringent standard of soil erosion control. These provisions are widely referred to as “sodbuster.” The conservation measures required under this program come closest in the United States to representing a basic level of “good farming practice” or environmental compliance such as exists in the EU.

Since producers must pay the costs of complying with conservation compliance programs, it is difficult to

quantify the expenditures on such programs compared with the voluntary programs funded by the U.S. Government in “U.S. Agri-Environmental Programs.” The evidence on the costs and benefits to producers of complying with HEL and wetland provisions is mixed. Costs include applying an approved conservation system or the opportunity cost of not using HEL or wetland for crop production. Some practices, such as conservation tillage, have probably lowered production costs for some (but not all) producers who have adopted them as part of a conservation system. ERS (2000, section 6.3) presents more detail about the benefits and costs of conservation compliance.

One of the advantages of U.S. agri-environmental programs is their flexibility for both individual producers and the government. Although conservation programs are designed and operated by USDA, producers can choose which programs to participate in and often have significant flexibility in selecting conservation practices that fit their own climate, soils, crops, and management skills. At the same time, USDA can target specific environmental problems or areas with greater environmental needs, although authority for environmental targeting is reduced in some programs, particularly EQIP, by the 2002 Act.

U.S. agri-environmental programs are primarily directed at preventing or alleviating specific environmental problems that are a direct result of agricultural production, such as soil erosion, water pollution, destruction of wildlife habitats, or production on wetlands and HEL. With few exceptions, the United States does not use Federal level agri-environmental policy for the purposes of promoting what are considered by some to be the “positive” environmental by-products (i.e., amenities) of agriculture, such as open space, scenic vistas, or small-scale farms. Such “environmental” goals are left to other U.S. Federal or State programs.⁸ The EU, on the other hand, supports such amenities of agriculture as part of the EU-wide agri-environmental policy, although the European Commission has limited control in the design and operation of specific programs. With the 2002 Act, U.S. Federal policy appears to be moving in the direction of directly addressing the amenities of agriculture. Namely, the new version of the Farmland Protection Program extends eligibility to land with “historically important land areas and structures.”

⁸See American Farmland Trust (1998) for a list of U.S. State agri-environmental programs.

EU Agri-environmental Policy

Like U.S. agri-environmental policy, EU agri-environmental policy uses a combination of voluntary, regulatory, and cross-compliant programs to achieve environmental goals. However, while the similarities between the United States and EU in general agri-environmental policy measures and goals are greater than the differences, the EU gives greater latitude to member states in the design and implementation of agri-environmental programs than does the United States, where Federal-level programs apply to all States. “EU-wide and EU Member Country Programs” shows the EU-wide and some of the EU-member country programs conforming to current EU agri-environmental legislation. Unlike the U.S. Government, the European Commission does not design or run the day-to-day operations of most agri-environmental programs. The Commission instead establishes guidelines for three broad categories into which both EU-wide and EU member state programs are placed. The amount and source of compensation, if any, depends upon the category under which the agri-environment program falls.

Basic legal standards are regulatory rules that apply to all EU member states and their farmers. Farmers must comply with these environmental regulations without receiving any compensation. The EU Nitrate Directive is an example of a basic legal standard that applies specifically to agriculture (“EU-wide and EU Member Country Programs”).

The June 2003 CAP reform agreement provided further incentives for producers to observe environmental rules by tying producer payments to compliance with statutory environmental standards, as well as food safety and animal health and welfare standards. In addition, there is a new requirement that producers maintain land in “good agricultural and environmental condition” to receive payments. The reform makes compulsory the cross-compliance provision that was previously optional to member states.

Good farming practices are basic environmental standards that farmers are expected to observe without receiving direct compensation at the federal level. However, unlike basic legal standards, the Commission does not mandate good farming practices but allows each member state to decide what good farming practice is. Member states can make good farming practices mandatory or cross-compliant by tying the

adoption of such practices to federal payments. Prior to the 2003 reform of the CAP, only a few EU member states had such programs in place. The general principle behind “good farming practices” is similar to the requirement that farmers undertake certain conservation practices under the USDA’s cross-compliance rules. EU member states have the ability to tie EU payments to state agri-environmental regulations; States in the U.S. do not have this ability.

Agri-environmental measures are strictly voluntary. The EU subsidizes most measures that fall under a set of broad policy objectives, listed under the EU-wide programs in “EU-wide and EU Member Country Programs”. In return for adopting such measures, EU producers receive a payment calculated on the basis of income foregone and the financial incentive needed for adoption. Payments are limited to 450-900 euros per hectare (\$182 to \$365 per acre at 1 euro = 1 dollar) depending on the type of land use. As in the EQIP program in the United States, producers in the EU can choose specific agri-environmental measures best suited to their operations. “EU-wide and EU Member Country Programs” provides examples of EU agri-environmental measures in EU member states.

The 2003 CAP reform added several new agri-environmental measures. It provided for increased funding for projects to promote the environment, allowed member states to make new payments to producers to support agricultural activities that are important for protection of the environment, and allowed member states to offer temporary support to help producers adapt to new environmental standards (European Commission, 2003).

Most EU agri-environmental programs, while funded at the EU level, are administered by the member states. Therefore, it is difficult to break down EU expenditures on specific programs. Table 1-F shows EU expenditures in 1998 on agri-environmental programs by member state. The EU spends considerably less in total (about US\$1.6 billion or 4 percent of total EU agricultural spending) on agri-environmental programs than the United States (US\$3.17 billion or 6 percent of U.S. agricultural spending), but possibly more per acre. In addition, both the EU and United States also have state-level funding of agri-environmental programs.

Perhaps the relevant difference between U.S. and EU agri-environmental programs is not the level of funding, however, but the types of programs that are considered

EU-wide and EU Member Country Programs Conforming to EC 2078/92 (examples)

EU-wide Programs

- The Nitrate Directive (EC 91/676/EEC) seeks to reduce pollution caused by nitrates from agricultural sources by requiring member states to implement action programs in areas identified as being vulnerable to pollution. Under the directive, the application of livestock manure is to be limited to 170 kg N/ha by 2003.
- Under EC Reg. 1257/99, support can be given to farmers who for at least 5 years use production methods designed to protect the environment and maintain the countryside in order to promote farming methods which promote the protection and improvement of the environment (which includes the landscape and its features, natural resources, the soil, and genetic diversity), environmental planning in farming practice, extensification, the conservation of farmed environments of high natural value, and the upkeep of the landscape.
- EC Reg. 1257/99 allows for compensatory payments to farmers who produce in less-favored areas such as mountainous areas, areas threatened with abandonment, or areas in which “the maintenance of agriculture is necessary to ensure the conservation or improvement of the environment, the management of the landscape, or its tourism value”.
- As part of the EU’s Agenda 2000 agricultural reform, farmers are expected to observe basic environmental standards, also known as good farming practices, without direct compensation. Good farming practices are not legal texts mandated by the Commission but rather the Commission allows each member state to decide what good farming practice is.
- Environmental programs under commodity support regimes. Certain of the EU commodity regimes provide payments for implementing environmental practices or require that producers implement environmental practices as a condition of receiving payments.
- Producers of beef cattle must not exceed a maximum stocking density (livestock units per hectare) as a condition of eligibility for payments. In addition, producers who observe lower stocking densities are eligible for an extensification premium.
- Producers of arable crops producing more than 92 tons of arable crops are required to set aside a portion of their land. The base level set-aside requirement is 10 percent. Member states are required to introduce measures that ensure that set-aside land is maintained so as to protect the environment. Some examples of recommended practices relate to the use of field margins, choice of set-aside cover, timing of cutting, cultivation, and the spreading of animal manure.

Examples of EU Member State Programs

- United Kingdom. In England, the Countryside Stewardship makes payments to farmers and other land managers to enhance and conserve agricultural landscapes as well as associated wildlife and history, and to improve opportunities for public access. Grants are available towards capital works such as hedge laying and planting, repairing dry stone walls, etc. The Organic Farming Scheme provides payments to farmers for adopting authorized conservation practices above those set out under the minimum standard of “good farming practices”.
- Italy. Sicily’s “Plan for Rural Development” (Regione Siciliana, undated) has provisions that include: 1) providing payments for adopting “integrated production methods” (or organic methods), to reduce nitrogen and phosphorus applications by at least 25 percent over the levels required under “good farming practices” for specific crops; 2) making payments for activities that maintain scenic aspects of agriculture, and 3) providing financial aid for maintaining olive trees in excess of 100 years old, and nuts and chestnuts on terraces at more than 300 mt altitude.
- Germany. Measures established at the state level include those that promote extensive farming by reducing inputs to arable land, organic farming, and support the rearing of local breeds of animals in danger of extinction. For example, the Schleswig-Holstein region offers a 20-year set-aside for arable land. North Rhine/Westphalia provides incentives for the conservation of fruit trees and wetlands, as well as arable land set-asides. Rheinland-Palatina provides incentive measures to preserve traditional agriculture activities such as wine growing in hill areas.
- Greece. Farmers are required to rotate cotton with cereals and to limit the application of nitrate fertilizer to specified low levels. Irrigation systems that reduce nitrogen leaching and erosion are promoted.
- France. All agri-environmental programs in France are administered under the auspices of the Land Management Contract (Contrat Territorial d’Exploitation, or CTE). The program funds project-specific contracts between individual producers and government. Projects may cover a broad set of objectives, including environmental protection. The program is co-funded by EU (Guarantee Fund) and the Government of France. Support is given to producers for project startup expenses, plus additional annual aid for up to 5 years for the increased cost of production resulting from the project. The share of expenses compensated varies. Examples of environmental projects include: rehabilitation and upkeep of irrigation, conversion to organic agriculture, replacing chemical herbicides with mechanical weed control, planting natural grasses between rows, replacing chemical fertilizers with compost, establishing and maintaining grassland (pasture), etc. About half the contracts have gone to livestock operations.
- Ireland. The basic program is the Rural Environment Protection Scheme (REPS). A farmer who joins the scheme enters into an environmental management agreement comprising a series of 12 obligations that must be fulfilled on all parts of the farm. The obligations include drawing up and following a plan for protections of water, nutrient management, stock management, hedge and stonewall repair, and habitat protection.

Table 1-F—EAGGF-Guarantee Expenditures in 1998 for agri-environmental programs covered under EC regulation 2078/92 and related statistics¹

Country	EAGGF-Guarantee Expenditures ²		Percent acres covered by Reg. 2078/92 ³	Agricultural Gross Value Added as percent of GDP ⁴
	Expenditure in ECU Millions	Expenditure as percent of total		
Belgium	12.4	0.72	1.7	1.00
Denmark	12.5	0.72	3.9	1.70
Germany	285.6	16.54	38.9	0.80
Greece	6.9	0.40	0.6	5.40
Spain	76.4	4.42	2.9	3.00
France	143.1	8.29	22.9	1.80
Ireland	113.7	6.58	24.1	2.60
Italy	379.4	21.97	13.6	2.40
Luxembourg	5.0	0.29	75.9	0.70
Netherlands	14.9	0.86	1.9	2.50
Austria	295.5	17.11	67.8	0.90
Portugal	87.3	5.06	16.8	1.90
Finland	140.5	8.14	86.9	0.60
Sweden	103.6	6.00	51.6	0.40
United Kingdom	50.2	2.91	14.6	0.50
EU Total	1,727.0	100.00		

Notes:

¹ Note that these data pre-date the Agenda 2000 reforms, which established many of the agri-environmental programs described in “EU-wide and EU Member Country Programs”. Current expenditures are likely to be distributed differently.

² These European Agricultural Guarantee and Guidance Fund (EAGGF) expenditures represent outlays from the EU to member states.

³ Percent of farm acres in each member country covered by agri-environmental programs covered under Reg. 2078/92.

⁴ 1998 Agricultural Gross Value Added as a percentage of gross domestic product.

Sources: European Commission (1998); OECD (undated).

to be “agri-environmental.” The following table lists agri-environmental measures or goals provided by the EC, divided into three broad categories:

EU Agri-environmental goals (by category)

1. Environmentally-beneficial productive farming

- input reduction
- organic farming
- extensification of livestock production
- conversion of arable land to grassland and rotation measures
- undersowing and cover crops, strips, preventing erosion and fire
- preserving areas of special biodiversity/nature interest
- maintenance of existing sustainable and extensive systems
- preserving farmed landscape

2. Non-productive land management

- set-aside
- upkeep of abandoned land and woodland
- maintenance of the countryside and landscape features
- maintaining public access

3. Socio-economic measures and impacts

- training
- supporting farm incomes
- employment
- societal attitudes

Source: European Commission (1998; pg. 38).

The EU, to a greater extent than in the United States, uses environmental protection as a rationale for the continued government support of agriculture as a whole and has a wider range of measures it considers to be environmentally related (point 3 in the box above). Some examples would be the protection of farm incomes and employment, promotion of rural development, and the upkeep of woodland.

The EU also places a special emphasis on the rural development goals of agri-environmental policy. While in the United States rural development and conservation are different policies addressed by different programs, agri-environmental policy in the EU is now a part of rural development policy and can be difficult to distinguish from rural development programs (e.g., European Commission, [undated]). For example, the compensation payment scheme in EC 1257/99 (table 2-F) highlights one of the explicit goals of the EU agri-environmental policy not found in U.S. agri-environmental policy, that of preventing land abandonment. The EC has stated that preventing land abandonment by keeping large numbers of family farmers on the land is necessary to preserve the natural environment in the EU (CEC, 1991). The 2003 CAP reform agreement gave member states broad discretion to maintain product-

specific support in order to prevent land abandonment and cessation of production (European Commission, 2003). While the prevention of land abandonment may also be an important issue in the United States, the proximity of rural and urban areas in the EU, combined with the fact that it is difficult to find untouched natural landscapes in Europe, may cause land abandonment concerns to play a more prominent role in directing EU agri-environmental policy (Potter, p. 108).

As a whole, the differences between U.S. and EU agri-environmental goals and programs can be considered to be largely definitional. Some agricultural policy goals and measures that the EU classifies as agri-environmental are classified in non-environmental categories in the United States. This difference in classification may make a difference in how agri-environmental programs are notified to the World Trade Organization (WTO).

Agri-environmental Policy and the WTO

In the 1995 Uruguay Round Agreement on Agriculture, WTO members agreed to reduce spending on many domestic support policies. However, an exception was made for expenditures on agricultural policies that are presumed to have a minimal impact on production and trade. This exception is commonly referred to as the “green box,” and policies notified under this exemption are called “green box policies.” Since 1995, most EU and U.S. agri-environmental policies have been notified as green box policies.

The Agreement on Agriculture sets forth conditions that all policies must meet to qualify for the green box exemption (WTO, undated):

- must have no, or at most minimal, trade-distorting effects or effects on production;
- must not support prices or increase consumer costs; and
- must be financed by the government.

In addition, there are specific conditions that agri-environmental policies must meet to qualify for exemption. Green box environmental programs must limit subsidies to the extra cost or loss of income involved in complying. Green box resource retirement programs (some agri-environmental programs are notified under “structural adjustment through resource retirement programs”) must retire land for a minimum of 3 years

and must not link payments to prices or production that apply to land not retired (Vasavada et al.).

Countries are required to notify the WTO of amounts spent on green box policies. In 1999, the last year for which U.S. domestic support notifications are available, the United States notified the WTO of outlays of US\$332 million for environmental programs, and \$1,434 million on resource retirement programs (e.g., the CRP). These two categories amounted to 3.6 percent of total U.S. green box expenditures. In addition, other outlays on research and advisory programs and technical assistance related to environmental and conservation programs are notified under “General Services.”

In 1999/2000, the EU notified expenditures on environmental programs of about US\$5.5 billion, and outlays on producer and resource retirement programs (long-term set-aside) of US\$122 million, accounting for about 28 percent of total green box outlays. EU green box expenditures on environmental programs are higher than expenditures on agri-environmental payments shown in table 1-F because the green box includes expenditures on producer and resource retirement and forestry programs that are not agri-environmental programs.

Conclusion

The United States and the EU have many similar types of agri-environmental programs and goals, especially when it comes to preventing negative environmental by-products such as soil erosion, overuse of chemical pesticides and fertilizers, and abuse of environmentally sensitive areas such as wetlands and wildlife habitats. Moreover, both the EU and United States offer flexibility for programs to be modified to meet the specific environmental needs of individual communities. In the United States, this flexibility is given to the producer, while in the EU, it is more likely to be given to the member state.

However, there are also important differences between EU and U.S. programs. The EU programs can emphasize socio-economic goals such as maintaining farm income and employment in less-favored areas. The EU emphasis on maintaining landscape features has little counterpart in U.S. Federal agri-environmental policy. EU agri-environmental programs also focus on preventing land abandonment. Preventing land abandonment is an environmental concern for the EU that is also tied to rural development objectives. EU policy-

makers are concerned that lower support prices, reduced government support, and decoupling support from production may provide incentives for some producers to leave farming altogether.

Both the EU and United States are moving forward with plans to expand their agri-environmental programs. The agricultural policy reform adopted by the EU in June 2003 significantly increases the CAP's focus on the interactions between agriculture and the environment by shifting some funds from producer support to environmental programs, implementing compulsory cross-compliance. In the United States, the farm bill enacted by Congress in spring 2002 includes the new Conservation Security Program, which will introduce a form of "green payments." These payments are intended to accomplish the task of improving the environmental performance of production agriculture, but may also provide an alternative source of farm income relative to traditional commodity programs.

As environmental movements in developed countries grow more influential, the recasting of farm support programs in a "green" light may become more politically popular. Providing environmental services through agricultural programs may become an increasingly important rationale for continued agricultural support in the future. If new WTO trade negotiations produce an agreement to further reduce trade-distorting domestic support, countries may find it necessary to shift support from programs that are subject to reduction to exempt programs, such as agri-environmental programs that qualify for inclusion in the WTO's "green box". Such a shift will require more than cosmetic changes to price and income support programs if they are to comply with WTO criteria for green box payments.

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