

The 1995 Farm Bill: Issues, Options, and an Analytical Framework for Integrated Economic and Environmental Policy Assessment

Stanley R. Johnson, P.G. Lakshminarayan, Bruce Babcock,
Andy Manale, and David Zilberman

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Center for Agricultural and Rural Development
Iowa State University
Ames, Iowa

Stanley R. Johnson is C.F. Curtiss Distinguished Professor of agriculture and director of CARD; P.G. Lakshminarayan is a CARD associate scientist; Bruce Babcock is associate professor of economics and head of the Resource and Environmental Policy Division, CARD; Andy Manale is policy analyst, Environmental Protection Agency, Washington, D.C.; and David Zilberman is professor of agriculture and resource economics, University of California, Berkeley.

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ABSTRACT

A viable agricultural policy should adapt to any changes occurring within the agricultural sector. With the growing focus on environmentally friendly agriculture, increased role for markets by reducing the influence of farm programs, agricultural-related global climate change, and budgetary pressures, the 1995 Farm Bill can lead the reorienting of farm policies toward achieving these goals and thus preserve the leadership role of the U.S. agricultural sector. The 1995 Farm Bill should enable farmers to retain their competitive edge in the increasingly free global market and also should protect the environment and rural communities. This paper identifies key issues and the available options for the upcoming Farm Bill discussions.

THE 1995 FARM BILL: ISSUES, OPTIONS, AND AN ANALYTICAL FRAMEWORK FOR INTEGRATED ECONOMIC AND ENVIRONMENTAL POLICY ASSESSMENT

Background

The perception is growing that U.S. agricultural policy has reached a major turning point. Increased trade opportunities with GATT, a continued decline in rural population, increased budgetary (fiscal) pressure, and growing environmental concerns over agricultural nonpoint source (NPS) pollution are among the primary reasons. Because of these trends, nontraditional interest groups representing urban and environmental interests will play a greater role in shaping future farm legislation. Urban interests see farm program payments as competition for funding their programs. Environmental groups are increasing their demands as recognition grows that policies for price stabilization and income maintenance affect the environmental performance of agriculture. As a result, limits on government spending on farm programs and increased farmer adoption of environmentally friendly production practices are two policy goals that are increasingly important. Improved economic efficiency may also result if new policies reduce price distortions.

The involvement of environmental groups in shaping agricultural policy is not new. It began in earnest with the new conservation title in the Food Security Act (FSA) of 1985. The largest conservation-oriented cropland retirement initiative, the Conservation Reserve Program (CRP) that targeted highly erodible land, was introduced in 1985. Also included in FSA was Conservation Compliance, a program that has increased restrictions on the practices of farmers who participate in government farm programs. The Food, Agriculture, Conservation, and Trade Act (FACTA) of 1990 expanded environmental initiatives by extending the type of land eligible for CRP to include buffer strips, riparian corridors, wetlands, and other environmentally fragile lands. Also, FACTA modified conservation provisions to address surface water, groundwater, and wetland issues. Specific titles addressing these issues are the Environmental Easement Program, Agricultural Water Quality Protection Program, and Wetlands Reserve Program.

Concurrent with the growing environmental orientation of agricultural policies were attempts to make the farming sector more efficient by reducing the influence of farm programs on farmer decisions. The FSA of 1985 modified deficiency payment calculations so that payments were based on fixed program yields rather than actual yields. The advantage of this approach is that farmers will produce yields that are profitable under market prices rather than profitable under high government

prices. This trend towards greater market orientation continued with FACTA. The number of acres eligible for deficiency payments was reduced by the introduction of 15 percent Normal Flex Acres and 10 percent additional Optional Flex Acres. Production flexibility was enhanced by extending planting flexibility to more crops and by allowing 0-92 acres to be used as Flex Acres.

Despite these policy changes, criticism of current commodity programs continues. Even with reductions in the number of acres eligible for deficiency payments, the budget cost of commodity programs remains high. And a large portion of the benefits of current programs accrue to large farmers, raising equity concerns. There also is a growing concern that the environmental benefits from Conservation Compliance will be lost if current trends towards reducing deficiency payments continue. Reductions in farm payments decrease participation rates, thereby decreasing the influence government policy has over agriculture. And despite increased production flexibility, program crops continue to receive greater support than nonprogram crops, thereby discouraging potentially profitable crop rotations that have favorable environmental impacts. In addition, continued production inflexibility caused by differential support for program crops maintains a weak production response to price signals.

Key Issues

To maintain a leadership role in this evolutionary era, the U.S. Environmental Protection Agency (EPA) and other federal agencies must adjust and expand their traditional regulatory approaches. Considering innovative policies that improve environmental performance and reduce budget costs will increase the relevance and visibility of players in the upcoming policy debate. Key issues in the debate will include (1) the formulation of a new CRP policy; (2) the formulation of how to more directly link farm payments to desired environmental outcomes; (3) the perennial problem of integrating crop insurance and disaster relief programs; and (4) consideration of the impacts of agriculture on global environmental issues such as ozone depletion and climate change.

The two main farm policy instruments that yield environment benefits, CRP and Conservation Compliance, will be scrutinized to determine if they are the best tools available for delivering environmental protection. Without a doubt, soil erosion has been significantly reduced under CRP. This is not surprising, given that CRP was targeted at highly erodible lands and that 35 million acres of cropland were taken out of production. However, because of its limited environmental objective, CRP has had less impact on other important environmental performance indicators, such as water quality, air quality, preservation of biodiversity, and wildlife habitat protection. It must also be

recognized that future CRP policy will be not discussed solely in terms of its environmental attributes. Since its inception in 1985, CRP has evolved into an important source of supply management and farm income support with annual payments expected to reach a peak of \$1.9 billion in 1996. Economically, politically, and environmentally, CRP plays a pivotal role in U.S. farm policy (Cook 1994).

The other main tool of environmental protection, the Conservation Compliance provision,¹ will be scrutinized in terms of its ability to deliver environmental benefits under current enforcement policy and under a decreased aggregate level of government farm payments. The basic question of how to target payments to obtain desired environmental benefits more directly than under current Conservation Compliance and CRP policies will be an important issue in upcoming discussions.

The federal disaster relief and flood assistance programs have almost become an entitlement rather than a source of temporary relief for stricken farmers. The feasibility of replacing ad hoc disaster assistance with a more revitalized crop insurance and/or revenue assurance program will be an important issue to consider. A related longer term issue that the 1993 Midwest floods and the 1994 Southeast floods brought to the forefront is federal flood policy. Under what circumstance should farmland be protected from flooding? Alternatives to a policy of complete levee rebuilding should be assessed for environmental and economics impacts. Already many farmers in the Midwest are finding the Wetlands Reserve Program a viable alternative to recultivation of land susceptible to flooding.

Other environmental issues that may emerge in farm bill discussion include ozone layer depletion and the global climate change (GCC) initiative. GCC proposals addressing climate modification through agricultural and forest production changes are receiving increased attention. Agriculture- and forest-related climate issues include atmospheric CO₂ emission, emission of greenhouse gases from fertilizer application, and the impact of soil tilling in hastening the release of harmful emissions into the atmosphere.

In August 1994, discussions about the upcoming Farm Bill were held under the auspices of the Center for Agricultural and Rural Development (CARD) at Iowa State University. Present were representatives from the Resource and Environmental Policy division of CARD, including members of the CEEPES (Comprehensive Economic and Environmental Policy Evaluation System) modeling

¹Conservation compliance requires farmers with highly erodible cropland to fully implement an approved conservation plan by 1995 to maintain eligibility for farm program benefits.

team, FAPRI (Food and Agricultural Policy Resource Institute) representatives, and others interested in farm policy. The group met to discuss the current status of the Farm Bill debate, to suggest likely policy options that will be considered for the 1995 Farm Bill, and to outline the analytical framework that will be needed to evaluate these policy options. The group was unanimous in recognizing that:

- Policy options should be evaluated on the basis of fiscal impacts, environmental performance, and economic efficiency;
- Environmental performance should be judged using a broad set of indicators including soil loss, nutrient and chemical impacts on the atmosphere, groundwater and surface water, CO₂ emission, wildlife habitat, and biodiversity;
- Policies designed with incentives towards “green stewardship” should be paid for by penalties levied on “green abusers” so there are zero or limited fiscal impacts; and
- Policies should be judged at both national and regional levels to provide insight into the distributional effects of farm policy on environmental and fiscal impacts.

This report is designed to support efforts aimed at defining and assessing policy options relevant to the upcoming Farm Bill debate. The report summarizes policy alternatives identified by the CARD group and outlines an analytical framework for evaluating these policy options by fiscal cost, environmental performance, and economic efficiency.

Indicators and Tradeoffs

Potential conflicts between the producer and consumer welfare effects of commodity programs and the environmental performance of agriculture, as well as conflicts among the individual attributes (indicators) of environmental performance such as soil, water, and air quality and biodiversity, make integrated economic and environmental management and policy assessment difficult. Failure to fully recognize these conflicts and associated tradeoff opportunities in environmental indicators in the two previous Farm Bills is one reason why agricultural NPS pollution remains a problem. Piecemeal policies that focus on a single indicator, while ignoring the fact that ecosystems are highly interrelated, are inadequate. To minimize unfavorable environmental tradeoffs and to maximize the efficiency with which farm programs are implemented requires that policy interventions should focus on the relevant vector of environmental attributes rather than on a single attribute. Total environmental performance is best judged (given current analytical capabilities) by a vector of indicators including soil erosion, agricultural chemical and nutrient concentrations in water (both

groundwater and surface water), CO₂ and other harmful emissions into the atmosphere, wildlife habitat and other ecological factors, and biodiversity.

The further step of integrating environmental performance with economic and fiscal efficiency requires an additional set of indicators that include consumer prices, farm income, and government spending. Estimation of the effects of policy options on the relevant indicators can be used to better understand the magnitude of important tradeoffs between and within these two sets of indicators. These estimates can be used by policymakers and various political interests to shape their priorities for the debate on the Farm Bill titles. The CEEPES-FAPRI analytical framework is one system to provide analytical solutions and estimates of tradeoffs for alternative policy options for the 1995 Farm Bill debate.

Policy Options

Commodity Programs and Deficiency Payments

Current programs are criticized on many levels. An efficiency drawback is that the link between consumer demand and production decisions is weakened by subsidizing only program crops. An equity issue arises because the primary beneficiaries of the programs are large farmers with nearly 73 percent of the program benefits going to the largest 15 percent of producers (Browne et al. 1992). Current programs can also discourage the adoption of environmentally friendly agricultural practices, such as certain rotations. In addition, commodity programs are a major fiscal burden. Deficiency payments triggered by market conditions and participation levels totaled \$8.94 billion in 1993. Future commodity programs seem poised to address these concerns by featuring lower government costs, more farmer control over planting and marketing decisions, and increased emphasis on environmental outcomes. New commodity program will likely aim at “commodity decoupling” and “green recoupling.” Selected policy alternatives to accomplish this reorientation include the following.

- Eliminate commodity programs and deficiency payments and substitute a revitalized crop insurance or revenue assurance program.
- Add a “Green Flex” option that provides an additional 10 percent “paid” flex acres tied to the adoption of cropping practices that decrease environmental impacts. Examples include crop rotations with hay and small grains, strip intercropping, and integrated pest management.
- Allow participating farmers to use acreage set-asides for environmentally beneficial activities without losing their program base.
- Encourage super compliance that extends current compliance provisions to include water quality and ecological indicators with more strict enforcement.

- Maintain the current commodity program with possible reparameterization of target prices, loan rates, the 0/92 option, and normal and optional flex percentages.

CRP Policy Options

CRP contracts begin expiring in fall of 1995. By 1997, contracts covering 15 million acres will expire. By 2002, all 35.3 million enrolled acres will have left CRP. Upon expiration, annual rental payments will cease and farmers holding these contracts will no longer be obligated to maintain conservation practices on their CRP acres. A survey conducted by the Soil and Water Conservation Society (SWCS) in 1990 indicates that approximately 53 percent of CRP acres will return to crop production, thereby reversing some of the soil conservation and other environmental benefits of CRP. Recent surveys indicate a much higher percentage of cropland returning to production. In addition to the environmental consequences of the end of CRP are the budgetary impacts. Without a change in current programs, more land in production may lead to increased commodity program costs. And any policy option that continues CRP must include financing. The off-budget financing of past CRP is not a viable future option.

The options for extending CRP are based on different means of selective renewal of contracts. The suggested criteria for determining the most environmentally vulnerable CRP lands are: lands with annual soil loss exceeding a certain threshold, lands that are close to surface water supplies, lands vulnerable in groundwater contamination, and lands that are now a safe haven for wildlife. Additional options addressing other biodiversity issues could also be formulated.

- “Green” CRP, linking green payments to CRP. The government could purchase easements to cropping rights from farmers on environmentally sensitive lands. The optimal policy tool may include several types of agreements, including both long- and short-term purchases that depend on the potential costs and benefits. The government could allow some productive use of the CRP lands which would lower the easement purchase cost. By ranking land according to environmental benefits, the public should receive the maximum environmental benefit for the funding Congress is able to provide.
- Renew a fixed percentage (e.g., 50 percent) of the contracts. The contracts that would be renewed would be those that offer the largest environmental benefits as judged by the vector of environmental indicators.
- Purchase easements targeted to improve water quality and other environmental indicators in critical watersheds and river basins.
- Combine CRP, Wetlands Reserve Program, and Water Quality Incentive Program to develop a comprehensive soil, water, air, and ecosystem protection program targeted to the most environmentally sensitive croplands.

Policy Options for Global Climate Change (GCC)

Agriculture- and forest-related climate issues include atmospheric CO₂ emission, emission of greenhouse gases from fertilizer application, and the impact of soil tillage in hastening the release of harmful emissions into the atmosphere. Possible GCC policy options include the following.

- Link program benefits to the cultivation of winter cover crops, to increased adoption of minimum tillage, and to reduced N-fertilizer use. This option would subsidize crop production practices that result in increased sequestration of carbon.
- Subsidize reforestation efforts. If targeted to riparian areas, carbon sequestration would be achieved along with other environmental and flood control benefits.

Green Payments

Green payments programs, in lieu of current commodity program payments, are arousing attention. It is important, however, to point out that most green payment schemes fundamentally change the program relationship between the government and farmers. The fundamental difference is that green payment programs would be directed only to those producers who adopt environmentally friendly practices. Revenue-neutral green payment schemes would also tax those producers who do not adopt these practices. Any revenue-neutral schemes would be grounded with the “polluter pays” principle rather than with having taxpayers pay for environmental cleanup. A potential side benefit of eliminating deficiency payments would be additional production flexibility in agriculture by increasing the role that market forces play in farmers’ production decisions. Of course, inflexible green payment schemes could be devised that were even more restrictive than current deficiency payment programs, in which case production flexibility might actually decrease. Another benefit of revenue-neutral green payment programs would be a freeing up of funds currently spent on deficiency payments. These funds could be used for other agricultural programs or reallocated to other government programs. There are several green payment program options, including:

- Mandatory controls favoring crop rotations and management practices that are economically and environmentally sustainable.
- Mandated total farm plans requiring farmers to limit soil losses, and nutrients and chemicals contamination of various media (groundwater, surface water, and air), would be an evolution of current Conservation Compliance plans.
- Taxes on selected chemical and nutrient inputs to encourage adoption of input-saving technologies.

- Subsidizing of systems to organize cooperation among producers in watersheds. These systems could target stream quality and could include educational programs, incentive payments, and taxes.

Analytical Framework

Because some of the policy options to be considered involve irreversible impacts on the environment and agriculture, it is critical to conduct *ex ante* evaluations of the options soon enough to allow informed policy decisions. The regional-national linked modeling framework available at CARD is ideally suited for evaluation of 1995 Farm Bill options in this type of broad economic/environmental context. By using consistent assumptions, a regional-national modeling system benefits from integrating production and environmental information that has been generated at the regional level with the detailed information on market structure and commodity and input prices that have been provided by the national econometric simulation model.

More specifically, CARD's FAPRI and CEEPES modeling systems will be linked by imposing the FAPRI sectorwide projections (eg., crop prices and acreage, program base, and participation rate), on CEEPES (a watershed-based integrated agricultural economic and environmental modeling system) to determine crop rotations, irrigation, tillage, and conservation practices, and agricultural chemical and nutrient use. Using a calibrated set of environmental fate and transport models, the watershed-level (site-specific) environmental impacts (soil erosion, nutrient and agricultural herbicide leaching/runoff, and atmospheric loadings) from those production and resource use practices will be evaluated (Bouzaher et al. 1993a; Wolcott, Johnson, and Long 1991). If necessary data become available, wildlife and ecological impacts will also be evaluated. A comparative static approach will be used to obtain predictions over time.

The national model, which is represented by the FAPRI integrated modeling system, is used for making medium-term projections of the agricultural economy in relation to various policy shocks. The FAPRI system comprises domestic crop and livestock models, world trade model for grains and oil seeds, and satellite models that determine net farm income and the government cost of agricultural programs (Westhoff et al. 1990).² There is perfect feedback from these models to one another. Each of the FAPRI models is conditioned by assumptions about the general economy, agricultural policy, weather, and a number of other exogenous factors.

²It is important to note that the FAPRI analytical system uses farm income and government-cost components that are aligned with CBO's budget evaluation procedures.

Integrating CEEPES with FAPRI creates a system ideally suited for the type of policy evaluation needed to analyze 1995 Farm Bill options in which regional and environmental impacts are important. CEEPES is able to capture fundamental heterogeneity of agriculture by explicitly modeling variability in weather, soil, and other environmental conditions that lead to variations in productivity and crop management strategies across regions (Bouzaher et al. 1992). CEEPES is able to capture the effects of regional heterogeneity on crop choice, rotation, tillage and conservation practices, chemical inputs, and the resulting yields, cost of production, and net returns. By explicitly modeling such heterogeneity, important equity effects of alternative policies can be estimated. It is no longer adequate to simply assess the overall efficiency of policies and the aggregate gainers and losers. Rather, one should identify and estimate the regional effects of alternative policies. This capability is particularly important when considering the diverse U.S. agricultural sector.

Another advantage of the explicit heterogeneity of the CEEPES system is that important regional environmental effects can be estimated and assessed. The diverse response of producers to alternative policies, along with regional variability in soil and climate, leads to environmental outcomes that can vary dramatically over space. Because CEEPES is a disaggregated model, it can capture this critical variability. In many cases, it may be more important to policymakers to present the distribution of environmental impacts of alternative policies, rather than aggregate outcomes, because it may be more useful to identify and address regional situations of extreme severity that cannot be recognized by aggregate measures. CEEPES is able to provide both distributional and aggregate measures of environmental outcomes.

One last important advantage of using the CEEPES modeling system to conduct policy analysis is the number of indicators of environmental performance the system provides. Clearly, agricultural production has many side effects, from soil erosion to air and water pollution. Policymakers have multiple objectives when designing policies. CEEPES is able to estimate soil losses as well as both chemical and nutrient loadings (farmer applications) and the fate and transport to groundwater and surface water of these applications. Additional indices of environmental performance also will be included as necessary data become available.

In conclusion, the analytical capability of the CEEPES-FAPRI system can provide quantitative economic and environmental impact analysis of evolving environmental titles and new provisions that are advanced for the 1995 Farm Bill by Congress, EPA, USDA, and environmental and agricultural interest groups. The first generation of CEEPES was designed to assess a range of policy questions, including the joint welfare impacts of conservation programs (e.g., CRP, Conservation Compliance,

and Wetlands Reserve), environmental policies (the restricted use of atrazine and other corn and sorghum herbicides), and the soil carbon impacts of various agricultural land use patterns (Bouzaher and Manale 1993; Bouzaher et al. 1994). Demand for results of the analysis using CEEPES and FAPRI has been high for policy discussions in agriculture and environment, and the modeling approach has been given solid evaluations by technical experts and is widely published in the refereed scientific literature.

Next Steps

Currently, U.S. government agencies, Congressional committees, and other interested parties are evaluating their positions in advance of the upcoming legislative debate. EPA and other government agencies must consider how they will estimate the economic and environmental impacts of proposed policy options to help Congress. The economic and environmental modeling capabilities of CARD are being enhanced and integrated to allow such estimates to be derived.

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