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AN ASSESSMENT OF U.S. AGRICULTURAL POLICY AND LINKAGES TO TRADE AND ENVIRONMENTAL ISSUES

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The purpose of this brief paper is to evaluate some key issues in agricultural, trade and environmental policy. It draws on several longer papers that are available upon request.[1] It is selective, emphasizing what I consider to be some of the critical policy questions of major interest to U.S., Canadian and European researchers. These questions are somewhat disparate. First, and most limited in scope, what explains the current demand for policies to remedy the low price situation in U.S. agriculture? Second, what are the most important emerging agricultural trade items, especially as we consider the runup to the next round of multilateral trade negotiations early in the next century? Third, how will new technical developments in biotechnology affect agricultural, trade and environmental policy trends?

U.S. Farm Policy: An Unfinished Agenda

In the scheme of things, the 1996 Federal Agricultural Improvement and Reform Act (FAIR) contained important breaks with a tradition of crop-by-crop subsidies dating back to the Agricultural Adjustment Act of 1933 (see Stuart and Runge, 1997). It freed many producers of "program commodities" (maize, grain sorghum, wheat, barley, oats, cotton and rice) from a system of crop-specific base acre accounting, merged these accounts into a single "whole farm base," and allowed production of any but a few crops on these lands. Through such "freedom to

[1]Ervin, et al., 1998; Stuart and Runge, 1997; Runge, et al., 1997; Hauer and Runge (forthcoming); Jackson and Runge (1998).

farm" provisions, payments to farmers were thus decoupled from these crops. Farmers with recorded base acres were given the opportunity (which nearly all accepted) to sign a seven-year "contract" with the U.S. Department of Agriculture (USDA), under which payments will be continued on the merged base acres on a declining schedule until the year 2002. By fixing these future obligations on a per-acre basis, the floating obligations implied by the previous system of deficiency payments were ended (for now), resulting in agricultural subsidies that are no longer open ended entitlements to future payments from the Federal Treasury. While signers of the contract with USDA were entitled for seven years to a per-acre payment (whether or not they produce a crop), the total amount of these obligations was fixed at $35.6 billion and therefore predictable from a budgetary point of view. Overall, the freedom to produce in direct response to market forces, rather than on the basis of crop-by-crop subsidies, as well as the budget discipline of predetermined payments, were important steps in the direction of decoupled lump-sum compensation.

Yet from the point of view of advocates of policy reform, FAIR represents an unfinished agenda. A variety of problems and issues remain. First, the coverage of "freedom to farm" is only partial, with numerous commodities left out of the decoupling program. The mechanisms under which producers of these absent commodities (dairy products, sugar, peanuts and tobacco) receive compensation (and they differ) represent relatively low budget exposure, reinforcing their backburner status. Second, those critical of the distributive impacts of the commodity programs find little to cheer about in the new contracts, and consider the acronym FAIR ironic. A recent analysis of payments offered to corn growers under the 1996 legislation concluded that when these payments are compared with an equal degree of protection afforded by a portfolio of put

options contracts, corn growers will be overpaid between $2.9 billion and $12.7 billion over the seven years of FAIR for switching to a decoupled system (Stinson, Coggins and Ramezani, 1998).

As in the past, those who have accumulated the largest eligibility through combined acreage bases will receive the largest payments, effectively limited only to $80,000 per operation. Since these payments will be made ***over and above*** any marketing receipts, the largest producers will augment their already significant receipts with generous lump sum transfers from USDA. This will further reinforce the concentration of roughly 90 percent of receipts and payments in the hands of the 100,000-200,000 largest producers of field crops. While 1996 market prices were near all-time highs due to short grain stocks world-wide, making it difficult to justify such transfers on grounds other than pure political expediency, recent market price declines have made contract payments slightly less egregious from a distributive perspective. A related issue is whether the contract payments, once decoupled from specific crops, should necessarily be completely divorced from market receipts. An alternative would be to make them countercyclical, so that payments are made in times of low marketing receipts and recede in high times (see Cochrane and Runge, 1992). Fourth, political realists tend to doubt that the end of the seven-year contract will actually terminate transfers to these producers, as advertised. Careful observers of the Congressional Budget Office "scoring" of spending have noted that $4 billion remains in the 2002 budget for commodity programs, despite the alleged end of contract payments in that year.

Supply responses induced by price levels in the first two years of FAIR have led to substantially lower prices and marketing receipts in 1998. In a recent analysis of Minnesota net farm income, Olson reports substantial declines off of the high levels of 1996-97, with corn prices

received off 15 percent, soybeans off 18 percent, beef 5 percent, and hogs a whopping 29 percent lower. Only milk prices have increased (by 10 percent), reflecting a global shortage of butterfat (Olson, 1998). A call has now gone up to resuscitate some form of safety net, such as a return to deficiency payments or an extension and increase in contract payments under the 1996 Act. Farmers and their representatives have again emerged as chronic special pleaders, willing to extend indefinitely a system of transfers from the public purse, despite signing a seven-year contract that was supposed to lead to a transition to the market. It is appropriate to move now to finish the unfinished agenda of the 1996 Act by implementing a long term safety net based on some form of revenue assurance (á la Cochrane and Runge, 1992).

Emerging Trade Issues

As governments experience changing agricultural and trade conditions, and experience grows with post-Uruguay Round policies, a new set of issues will confront the next round of multilateral trade negotiations. While many such issues are noteworthy (see Josling, 1994; USDA, 1994), I will focus especially on two. These are, first, the role of sanitary and phytosanitary standards (SPS) as nontariff barriers; and second, the application of trade rules to genetically modified organisms (GMOs). While these issues intersect with each other, it is useful to separate them out for analysis. The GMO issue will be taken up in the next section.

The Uruguay Round Agreement on SPS represented recognition by the multilateral trading system that nontariff barriers are a major source of trade distortion, and are likely to grow over time. This is especially true where food and agriculture meet environmental and health concerns: the province of SPS. To date, however, implementing the SPS agreement has been

difficult. Roberts (1998) notes in an evaluation of the Uruguay Round Sanitary and Phytosanitary Standards (SPS):

> The challenge before the negotiators of the SPS Agreement was to create a set of rules which would strike the proper balance between allowing protection while disallowing regulatory protectionism. There are clearly public good arguments that make some SPS restrictions necessary to insure a safe food supply and protect the domestic environment from pests and diseases. In other cases, regulations rationalized on technical grounds seem to lack firm scientific foundations and, at least from the perspective of exporting countries, seem to be imposed primarily to thwart the commercial opportunities created by other trade liberalization policies...If the negotiators were successful, the SPS Agreement will be regarded as an important institutional innovation that counterbalances the influences of domestic interest groups that successfully lobby for SPS measures which lower net social welfare by restricting imports that pose negligible health or environmental risks (p. 2).

However, as Josling (1994) noted

> Although many view the new SPS Agreement as a significant advance, it is difficult to say how effective it will be in curbing trade disputes arising from health and safety standards. It could also lead to unwarranted changes in such standards. Many environmental and consumer groups fear that there will be an erosion of standards in the name of freer trade. The significance of these trade rules may soon be apparent. There are many important issues, such as inconsistent regulations on the use of Bovine Somatotropin in dairy production, different approaches to food irradiation, and disparate requirements for food labelling which threaten to burst on the trade scene and test these new SPS procedures (p. 17).

In addition to the challenges of SPS implementation, numerous other trade policy challenges remain. In a broad overview, Tangermann, et al. (1997), delineated three main categories of concern. These are, first, those items which essentially improve and refine the workings of the Agreement on Agriculture. The Singapore ministerial meeting in December 1996 considered a report from the Committee on Agriculture which highlighted a number of potential problems with the Agreement, include administration of the Tariff Rate Quota (TRQ) system, the

operation of the Special Safeguards mechanism for commodities subject to tariffication, and the implementation of the export subsidy restraints. Tangermann, et al. also noted that the provisions of the Sanitary and Phytosanitary (SPS) Agreement may need reconsideration. Second, the next steps toward market-orientation and market access will necessitate further reductions (or even elimination of) export subsidies, and more discipline in the area of trade-distorting domestic subsidies. State trading, environmental and labor issues will also continue to impinge on agriculture. Third, accession issues involving the Ukraine and other countries will have a significant influence over the preparation for the next round (Tangermann, et al., 1997, pp. 136-7).

Biotechnology and Genetically Modified Organisms (GMOs): A Hydra-headed Challenge

Agricultural biotechnology has been the subject of intense scientific interest and scrutiny for at least two decades. It is only in the last 3-5 years, however, that marketable products have emerged from this research that now promise to transform the agricultural landscape, affecting the environment, trade and food production in ways that are still largely unknown. The environmental, trade and food policy communities, in particular, have yet to formulate responses to the rapid emergence of biotechnologies in key commodities such as corn and soybeans. Beginning in crop year 1996, newly released varieties of genetically-engineered soybeans and corn (as well as cotton) were marketed in the U.S. for the first time. These seeds, including Roundup-Ready® soybeans and Bt corn[2] are genetically engineered with traits that offer improved yield or

[2]Bt stands for *Bacillus thuringiensis*, a bacterium present in soils that acts as a natural insecticide. This bacterium has been genetically engineered to be present in the corn plant itself, creating resistance to the European corn borer.

other performance characteristics in the face of weeds or pests. Roundup Ready® soybeans, for example, are impervious to the effects of glyphosate (Round-up®), a widely-used herbicide, allowing reduced total herbicide applications and better targeting of weed control, as well as fewer passes through the field. Bt corn is genetically engineered to resist the European corn borer, a widely encountered corn pest, thus reducing the need for insecticide applications. Sales of both of these seeds have been brisk, growing from a few percentage points of total soybean and corn sales in 1996 to an estimated 10 percent for RR soybeans and perhaps 5 percent of total corn seed sales for Bt corn in 1997. In 1998, sales of modified soybean varieties will capture over 30 percent of the U.S. market. These seeds are only the first generation of what are expected to be a growing stream of genetically engineered seed varieties, known in trade circles as Genetically Modified Organisms (GMOs).

These dramatic developments have left a number of key issues unresolved. Each of these issues concerns a form of market failure. The first of these is the distribution of benefits and costs associated with the new "super seeds." As these technologies move through the product cycle from lead markets in developed countries such as the U.S., and into developing countries, will their benefits be proportional to the increased costs of utilizing them? How will they relate to questions of agricultural scale, and to small farmers in particular?

A second issue related to possible market failures concerns the concentration of industrial control over these technologies. As a result of breakneck merger and acquisition activity in the U.S. and Europe, a relatively small number of large agricultural input and pharmaceutical companies are coming to dominate research and technology in the field of crop biotechnology. On the one hand, this will allow huge expenditures on the technology and its dissemination. On

the other hand, the control and concentration of the industry raises questions over access to the technology and the use of market power to extract monopoly rents.

A third area of market failure relates to a number of externality and public goods questions, involving biological and ecological risks. The two primary risks are that herbicide resistance may be transferred from genetically engineered plants to close plant relatives that are undesirable, including numerous weed pests.[3] The second is that plant resistance to insect pests will in turn cause insect mutations and counter-resistance, creating new and even more virulent insect pests. In order to prevent such mutations from taking hold, it is generally stipulated that farmers planting the insect resistent varieties continue to reserve a portion of their fields ("refugia") for traditional non-resistent crops, thus ensuring the survival of a pool of non-resistent insects.

Related to these market failures are several key features that make them emblematic of issues of sustainability in agriculture. The first feature is that the commercial and even the environmental benefits of crop biotechnology occur sooner in time than the risks. The avoidance of weed and insect pests occurs as soon as the crop is planted and harvested, together with the tillage and insecticide reductions noted above. The development of weeds and insects even more resistent to herbicides or insecticides, in contrast, will follow in future generations of plants and insects. No one knows how rapidly such resistance will occur (if it occurs at all), but it will certainly be further in the future than the current crop year. A fundamental principle of economics holds that insofar as individuals give greater weight to current as opposed to future consumption

[3]While this possibility is considered remote in the case of soybeans, other genetically engineered crops, such as genetically engineered canola, have closer relatives (e.g., wild mustard) in which the transfer of resistance is more possible.

and production, they will discount future risks relative to current benefits, in effect downgrading the significance of costs to future generations.

The second feature is that the risks of plants and insect resistance, if they occur, will be spread over a landscape that includes many growers of crops, and are in no way likely to be borne solely by the adopter of the new varieties. The fact that these risks are not internalized makes them a form of spatial externality, in which the costs of resistance are spread widely, while the benefits, at least initially, are concentrated in the hands of early adopters. Hence, the spatial externalization of risks interacts with the temporal asymmetry noted above, as early adopters push risks both outward in space and forward in time.

A third feature of the benefits and risks associated with crop biotechnology involves the disincentives of farmers to reserve a portion of their fields as refugia to create a preserve for insects that lack resistance to the new varieties. These disincentives arise because the benefits of such refugia are not fully captured by the farmers. Indeed, the crops in refugia will be vulnerable to the very pests against which farmers seek to insure by adopting the new varieties. The benefits are thus partly public goods, insofar as they return to all farmers seeking to maintain the efficacy of the new insect-resistant varieties. However, refugia are also designed to protect the investments of large seed and chemical companies by prolonging the efficacy of the new seed varieties. As in all cases of public goods, farmers have an incentive to free ride by shirking their responsibilities to maintain refugia, thus undercutting the long-term efficacy of the new varieties, and coincidentally reducing the long term payback to private investors. Finally, and ironically, insofar as private investors anticipate this behavior, they may seek to maximize short run sales of seed at the expense of maintaining refugia reserves.

Apart from these issues are numerous issues related to trade. The proliferation of GMOs has catalyzed international debate on world trade policy and standardization. The United States and the European Union (EU) have sparred over the validity of trade restrictions on these agricultural products. The United States, an exporter of GMOs to Europe, is advocating free trade in these materials. The current EU proposal is to mandate labeling of all agricultural products containing GMOs. This implies the need for standards for GMOs, such as those that would require all seed products containing greater than a specified amount of GMO product to be labeled as such. This type of standard would increase processing and transport costs and is interpreted by many in the industry as a form of nontariff trade barrier (NTB).

Europe has generally favored a higher standard of segregation of GMOs from non-GMOs, while the U.S. has argued for less or no segregation. Suppose a compromise is reached to harmonize, requiring that Europe drop its standards for segregating GMOs, but also requiring the U.S. to raise its labeling requirements. In Europe, producers surplus would initially fall as competitive U.S. exports of GMO oilseeds and feedgrains enter the European market, less impeded by EU standards. However, European producers would gain access and the ability to produce GMOs themselves, quickly regaining a competitive edge. Consumers surplus would increase with less expensive foodstuffs, but could fall if consumers fear GMOs as a form of health risk. Hence the EU negotiating stance on the proposed harmonized standard will depend on the perceived competitiveness effects on producers and the perceived health risks to consumers. (A recent referendum in Switzerland suggest that opposition to GMOs may be less than thought, making a European compromise more probable.) In the U.S., raised labeling requirements may raise costs and reduce producers surplus, but these costs would be offset by expanded market

access to the EU. Consumers would gain if the labeling requirements do not appreciably affect food costs and increase the perception of food safety.

My current research focuses on agricultural biotechnology in the two agricultural export commodities of corn and soybeans, considers the interplay of environmental and trade policies in the emerging markets for them, and analyzes the potential market failures described above, with attention to impacts in developing countries. In a larger sense, these issues illustrate the challenges of increasingly integrated markets for global commodities -- such that the environmental, trade and industrial policy decisions in one economy impose pressures on those of other nations, especially developing countries. The "global commons" thus necessitates the development of new rules that allow the nations of the world to jointly manage their economic, environmental and scientific affairs. While the United States may have some claim to a senior position in this respect, it is unlikely to succeed in creating hegemonical regimes in which consultation and coordination are unnecessary.

Insight into these developments is offered by the evolution of the World Trade Organization (WTO) under the General Agreement on Tariffs and Trade (GATT) in Geneva. A creation of the post-World War II period, the GATT slowly evolved a set of rules responding to the integration of the global economy, with the U.S. in a leading role. In the 1980s U.S. dominance was seriously challenged by the European Union (EU) as well as blocs of developing countries led by Brazil and India, in the negotiations of the Uruguay Round. Part of the challenge of the Uruguay Round was to deal with a set of "new issues," notably agriculture, intellectual property rights, and the environment. Since the end of Uruguay Round in 1993, one of the most difficult questions has revolved around harmonization (and a current lack thereof) of environment

standards, especially as between developed and developing countries. A leading example of these tensions occurred in the debate over NAFTA (North American Free Trade Agreement), which illustrated that as in trade, environmental interdependencies create a need for rules that set the terms by which economic integration proceeds. The struggles of the North American Commission for Environmental Cooperation (CEC), created as part of the NAFTA process, to mediate these disputes from its small Secretariat in Montreal illustrate the magnitude of the challenges faced not just in North America, but globally.

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