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Energy and the Farm Bill

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Prompted by calls for energy independence, rural development, and a solution to global warming, bioenergy is on the rise. This IPC Policy Focus discusses how the biofuel boom has impacted US Farm Bill discussions, and domestic agricultural policy, which has important implications for developing countries.

US farm bills are enormous pieces of legislation covering a myriad of issues, from domestic food assistance to rural development. In the 2002 Farm Bill, one more item was added to agriculture's list of responsibilities: energy. The new energy title in the 2002 Farm Bill dealt with demand and prices for energy on the farm as well as the supply of bioenergy. Since that time, the demand for and supply of bioenergy has skyrocketed, and US production has increased from 2.15 billion gallons of biofuel in 2002 to 5 billion gallons in 2006. Helped along by the precipitous rise in oil prices, incentives in the 2005 Energy Bill, and import restrictions, demand has expanded to such an extent that biofuel feedstock supply is now scarce, and the subsequent price effect on US agricultural commodities is having ripple effects on many aspects of the 2007 Farm Bill.

There are several ways in which the increased demand for and supply of bioenergy, mostly in the form of corn-based fuel ethanol, are shaping the Farm Bill. While the energy title of the 2007 Farm Bill will include biofuels programs, the most important biofuels legislation is likely to remain outside the remit of the Farm Bill. Nevertheless, the greatest impact of the US biofuels boom on the Farm Bill debate is its implications for the Farm Bill budget, in particular for the commodity programs. Changes to US commodity programs can be felt by agricultural producers around the world. Likewise, how the US will support the biofuels industry in the future will also have international repercussions.

Biofuels' Effects on Commodity Prices and Production

To clarify, bioenergy refers to any energy produced from biological feedstock, including, for example, electricity produced by methane generators used on livestock farms. The term biofuels specifically applies to biomass that has been converted into transportation fuel. Ethanol and biodiesel are the most commonplace. Ethanol, a gasoline substitute, is a liquid fuel generated from converting the carbohydrate portion of bio-mass into sugar and then fermenting the sugar, while biodiesel is produced through the transesterification of organically-derived oils or fats. While research is ongoing to convert all of a plant's biomass, even the cellulosic matter, into ethanol, this technology is not yet commercially viable. Therefore, in the US today, ethanol is primarily processed from the grain of field crops.

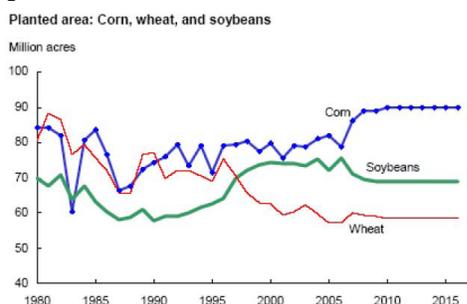
The recent investment in corn-based ethanol has been spurred by a number of factors. The rise of oil prices from 2003 to 2005 created an interest in alternative fuels for both cost and energy security reasons. These concerns led to the passage of legislation favorable to biofuels in the Energy Policy Act of 2005, which included, among other incentives, an escalating mandate for biofuels starting at 4 billion gallons in 2006 and reaching 7.5 billion gallons by 2012. To be cost effective, even with higher oil prices, investment in ethanol relies on already existing support measures, namely a 51-cent per gallon tax credit along with a 54-cent per

gallon tariff on imported ethanol for fuel use. The production of ethanol has soared because of these measures, aided by the fact that it integrates easily into the US's gasoline-based economy. Ethanol use received an additional boost in the 2005 Energy Bill, which discouraged the use of methyl tert-butyl ether (MTBE) as an oxygenate, leaving ethanol as the most accessible alternative.¹

The growing industry has created a burgeoning market for corn as biofuel feedstock, and, as such, biofuels' most apparent role on the Farm Bill debate has been their price effect on corn and other program crops. The preference for corn as a feedstock is due in part to the ease of converting its starch into fuel and to the favorable growing environment of the Midwest. However, corn's affordability also stems from the significant federal government support it receives.

Even though the corn supply has expanded in recent years (almost 11 billion bushels were produced in 2006/2007), the unprecedented investment in ethanol processing plants is creating scarcity in the market. The competition among feed users, ethanol processors, and exporters has driven the price of corn up from less than \$2.00/bushel at the end of 2005 to more than \$3.50/bushel in April 2007.² Moreover, the projected demand for ethanol is anticipated to keep the price of corn at this level for the life of the next farm bill.³

Figure 1.



Source: USDA, 2007

Unsurprisingly, high prices are causing farmers to plant more corn this season. USDA projects that 90.5 million acres will be planted this year, an increase of 12 million over last year.⁴ If this acreage total is realized, it will be the largest corn planting in more than sixty years.

The United States does not have virgin arable land with which to accommodate this surge in corn production. Therefore, additional acres will come from two sources. One is from acres currently devoted to other crops. For example, many farmers are choosing to plant corn after corn this season, rather than rotate with soybeans.⁵ USDA estimates that soybean acres will fall almost 8.4 million acres from the 2006 to 2007 crop years.⁶ Corn is also contributing to the reduction of cotton and rice acres across the South.

The other potential source for more corn acres is from the Conservation Reserve Program (CRP). Under 10-15 year contracts with USDA, farmers plant environmentally sensitive land to grasses or trees to mitigate soil erosion and water pollution as well as to reduce the supply of agricultural commodities. In 2006, over 36 million acres were enrolled in CRP. USDA anticipates that 4.6 million acres will exit the program over the next three years; 1.4 million of these acres will be in corn-producing states.⁷

Bringing more land into corn production addresses some of the ethanol feedstock supply issues, but it creates tightness in the supply of other agricultural commodities. With the decrease in soybean acres, the price of soybeans is expected to jump from \$5.90/bushel in 2006 to more than \$7.00/bushel in 2007.⁸ Moreover, the price of soybeans is projected to stay at \$6.75 or higher for the next ten years. The demand for wheat and barley as substitute feed grains for corn has also grown, placing upward pressure on the prices of these commodities. Indeed, USDA's projections through 2016 find the prices of major field crops to be above their 2006 levels for the majority of the time period.⁹

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Biofuels and Farm Support Programs

The intersection of sustained high prices with the expiration of the 2002 Farm Bill puts a spotlight on the current composition of farm support programs. As they are presently structured, higher prices of program crops affect the efficiency and effectiveness of farm commodity programs, conservation programs, and crop insurance.

As was noted in the second brief in this series, if the Title I commodity programs remain unaltered in the 2007 Farm Bill, the large increase in market prices

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will essentially deactivate the trade-distorting elements of these programs (except for cotton). USDA projects that the farm prices for major field crops will exceed their respective marketing loan rates through 2016, meaning that farmers will receive no marketing loan program benefits. Farmers will also find counter-cyclical program payments to be zero, as commodity prices are not expected to drop below their given target prices. Under these circumstances, except for cotton, the only payments that most farmers participating in Title I programs will receive are direct payments. These market conditions remove the added supply incentives created by the programs and thereby remove the market price suppression caused by program-induced supply.

Enrollment in CRP will be affected if farmers see it as a less attractive option. Presently, CRP payments per acre average roughly \$50, but these vary widely from region to region.¹⁰ USDA forecasts that net returns to corn will be over \$300/acre for 2007-2016. Wheat returns will be over 20 percent higher than their 2006 level and will be almost twice the rental rate of CRP. Net profits for soybeans will be quadruple the rental rate. To keep land in conservation programs, the payment per acre in corn-producing

regions is already rising.¹¹ While the large shift in acres from other crops to corn in the 2007-08 season will remove some of the pressure to put conservation land back into production, it is possible that as much as 11 million acres currently contracted to CRP will leave the program within the next three years, significantly reducing government spending on CRP.¹²

The federally subsidized crop insurance program will become more expensive under the new market conditions. With higher-priced commodities, premiums are higher for each given yield shortfall option and the government subsidy will be higher as well.

By increasing crop prices, the bioenergy boom has changed the budget costs and expected effects of current farm programs and therefore affected the policy positions of some traditional policy participants. Moreover, the growth of the biofuels industry and the new market circumstances have caused new constituencies to join the Farm Bill debate and advocate for change.

Even with higher current and expected prices, some commodity groups are calling for greater support programs in the 2007 Farm Bill, justified in their view by greater production costs over the past few years, which have lowered farmers' profit margins. Ironically, the increased costs have been caused, to a considerable extent, by high oil prices, which have made the ethanol boom possible, but have also raised the prices of fertilizer and pesticides as well as farm equipment operating costs.

As the most direct beneficiary of the biofuels expansion and the accompanying high prices, it is perhaps unsurprising that the corn lobby has chosen to reduce reliance on price protection and look instead to a combination of price and production insurance. Instead of the current price-based CCP, the National Corn Growers Association (NCGA) has proposed revenue-based counter-cyclical payments for program crops, which would be triggered when a farmer's revenue falls below the three-year average for county revenue.

This revenue-based scheme has gained little traction with the other commodity groups. Instead of arguing for a new approach, most are requesting the same programs with larger benefits. The National Association of Wheat Growers, for example, wants the target price for wheat to increase from \$3.92 to \$5.29, arguing that the target price was set too low in the 2002 Farm Bill and therefore the CCP has not provided them with a safety net.¹³ A \$5.29 target price would trigger wheat CCP payments in most years, as USDA projects the farm price of wheat to be in the \$4.25-\$4.55 range for the next ten years. Similarly, the US Rice Producers Association and the USA Rice Federation are also seeking increases to rice's current loan rate and target price.¹⁴ In addition to asking for a higher target price, the American Soybean Association wants a significant tariff imposed on imported biodiesel, so that biofuel derived from US soybeans can have domestic market advantages similar to those currently available to ethanol.

Livestock associations have not responded to the biofuels explosion with the same enthusiasm that has permeated commodity groups. The diversion of corn to ethanol has increased competition for feed grain for their animals, and the resulting higher feed grain prices have cut into their profit margins. While dried distilled grain with solubles (DDGS), a by-product of ethanol production, can be used as feed, it cannot completely substitute for corn, particularly for non-ruminant livestock. Furthermore, DDGS are difficult to transport and require a great deal of energy to produce, making cost-effective distribution problematic. To mitigate the negative impact biofuels are having on their profitability, most livestock producer groups, including the National Pork Producers Council and the National Cattlemen's Beef Association, are calling for Congress to discontinue incentives to ethanol production, which includes letting the tax credit and tariff expire in 2008 and 2010, respectively.

Non-Agricultural Perspectives

Conservationists, wildlife groups, and hunting organizations are also cautious about biofuels. Concern exists that biofuels will encourage farmers to put environmentally sensitive land back into production,

leading to water contamination through renewed fertilizer applications and an increase in soil erosion. Removing land from CRP will also decrease acres available as natural habitat for wildlife. Additionally, these groups are hesitant about the possibility of second generation biofuels, that is, ethanol that is produced from the cellulose of grasses and trees rather than from corn. Fearful that this will lead to the removal of biomass on CRP land, they are resisting any harvesting of vegetation from CRP that facilitates erosion or disturbs wildlife habitats.¹⁵

Environmental organizations have also gotten involved in the Farm Bill debate on this front, worried that the intensification of agricultural production to meet the need for biofuel feedstock will negatively impact soil and water quality. However, biofuels also have support from others in the environmental community, as they tend to produce less greenhouse gas than gasoline or diesel and thus may contribute to mitigating the effects of global warming.

National security proponents are also participating in the drafting of the Farm Bill this year. Rising fuel prices and escalating foreign policy tensions with key oil producing countries have caused many in this camp to see biofuels as a solution to US energy dependency issues.

Interest groups supporting rural development in the US are, of course, already involved in the Farm Bill debate. Because of the potential for job creation and local financial investment, these organizations are generally in favor of biofuels production.

Environmental organizations are now involved in the Farm Bill debate, but are worried that the intensification of agricultural production to meet the need for biofuel feedstock will negatively impact soil and water quality.

But some in the environmental community support biofuels, as they tend to produce less greenhouse gas than gasoline and may contribute to mitigating the effects of global warming.

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Administration and Congressional Perspectives

In its proposal for the 2007 Farm Bill, which it put forth in January 2007, USDA addresses

some of the divergent impacts of the added demand for biofuels. To appease the livestock producers and those interests concerned about high food prices, it suggests that funds for biofuel research and development should be devoted strictly to cellulosic bioenergy, with the long-term goal of reducing dependence on corn as a feedstock.¹⁶ To this end, over the course of 2007-2016, it wants to provide \$100 million for a new program to support producers of cellulosic ethanol. It is also proposing \$500 million for research on biofuels and bioproducts, \$500 million to support rural alternative energy and energy-efficient grants, \$2.1 billion in loan guarantees to support cellulosic ethanol plants, and \$150 million for biomass research competitive grants.¹⁷

Regarding conservation, the Administration seeks to increase funding for conservation programs by \$7.8 billion over a ten-year period. It proposes that farmers be allowed to harvest biomass from CRP for cellulosic energy production; however, it stipulates that this must be done in a manner that continues to provide environmental benefits and wildlife habitats.

The chairmen of the House and Senate Agriculture Committees, Representative Collin Peterson (D-Minnesota) and Senator Tom Harkin (D-Iowa) respectively, have voiced sympathy with livestock producers and are supportive of funding for cellulosic bioenergy research, development, and deployment. Indeed, Peterson is pushing for farmers to start growing cellulosic crops, so that feedstocks are already available as cellulosic energy production becomes affordable. However, both congressmen come from corn-producing states and will continue to be strong proponents for first generation ethanol. Indeed, they have emphatically averred that they will not introduce

foreign competition into the US biofuels market by repealing the tariff for imported ethanol. They also oppose reducing or eliminating the tax credit now provided to ethanol blended in fuel.

Congress has yet to begin serious drafting of the Farm Bill. The few “marker” bills that have been introduced have been generally supportive of biofuels, calling for increased funding for grants, loans, and loan guarantee programs that support renewable energy development on farms and for farmer-owned businesses and cooperatives. Several bills have also been introduced to expand the biofuels mandate well beyond 7.5 billion gallons, although none of these proposals has been put forward as farm bills.

International Perspectives

US biofuels policy is not only a domestic issue, but has several international implications. Most directly related to the 2007 Farm Bill, if the United States uses the opportunity created by high prices to reduce its legislated subsidy rates on a permanent basis, this would imply less policy-driven price suppression when markets decline again in the future. Such a policy change would create fairer competition in the international marketplace and would also allow the WTO negotiations to proceed more effectively.

It is also important to consider the international implications of US biofuels policy outside of the Farm Bill, although they can only be briefly listed in a short policy brief. Higher world commodity prices – brought about in part by US biofuels policies – would arguably benefit not only US farmers, but all farmers with any connection to international markets, so less developed country farmers gain from the price boom. Livestock producers that compete with corn as a feed grain may also benefit; for example, increased feedstock prices may be positively viewed in countries such as Argentina who produce grass-fed cattle. On the other hand, these same higher prices increase food costs for buyers, including both direct consumers and food aid buyers, thereby harming vulnerable consumers in poor countries. Since poor countries tend to be net food importers, as a group they are disadvantaged by high grain and oilseed prices.

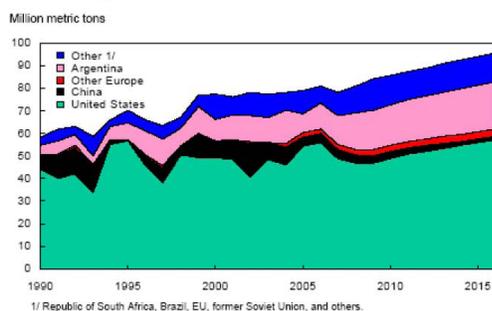
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of these changes and expand their corn production to fill this void in the international marketplace.

Moreover, if the United States were to allow imported biofuels to compete in the US market, some developing countries would gain an expanded market, particularly as many have comparative advantages in biofuel feedstocks and labor costs. However, to date, these policy shifts lack powerful support in the US; Congress seems more inclined to support domestic enterprises and restrict imports, regardless of any market efficiencies that may be created through biofuels trade.

Figure 2.
Global corn exports



Source: USDA, 2007

USDA anticipates that domestic ethanol production will limit the growth of US corn exports.¹⁸ Since the US currently represents 60-70 percent of world corn exports (over 50 million metric tons, see Figure 2), any change in its output will affect the world market. Moreover, the demand for corn will grow as meat consumption rises in transitioning economies. Therefore, a gap in supply and demand will emerge that will create new trade opportunities for developing countries. Countries such as Argentina, Romania, Bulgaria, South Africa, and Brazil will be in a position to take advantage

Conclusion

In addition to the various ways bioenergy is affecting Farm Bill discussions, perhaps its greatest impact is the degree of uncertainty that it introduces into the mix. All farm bills are written on assumptions of what the future will look like, but the effect of bioenergy demand on agricultural commodity prices ties this already volatile market more closely to one that ever more unstable: the oil market. The price of oil is notoriously difficult to forecast.¹⁹ Biofuel production in the United States depends on high oil prices in order to be feasible without inordinate subsidies. Should oil prices fall dramatically over the course of the 2007 Farm Bill, the US biofuel industry, and likely biofuel feedstock farmers, would have difficulty staying afloat.

Furthermore, because even with higher oil prices, biofuels are not competitive with petroleum fuels without tax benefits, agricultural backers of biofuels are reliant upon legislation beyond the Congressional Agriculture Committees to provide incentives. So far, Congressional support seems reliable, with several representatives and senators introducing bills that encourage biofuel production. However, it remains to be seen what state of mind Congress is in when the ethanol and biodiesel tax credits and the fuel ethanol tariff near expiration. Additionally, as is already apparent in this Farm Bill debate, reliance on non-agricultural groups draws more interest groups and opinions into the discussion.

Even if oil prices stay high and federal incentives persist to keep US biofuel at least marginally competitive with petroleum fuel, high commodity prices may not be long-lived. As evidenced by the increase in corn acres in the 2007 crop year, high prices usually encourage shifts in production that increase supply and slow the upward pressure on prices. It is this fear that is motivating many of the commodity groups to push for increased support payments even though times appear to be good. Farmers' planting decisions, which are difficult to forecast, will have an immense effect on the stability and strength of commodity prices.

With the positive impact on commodity prices, bio-fuels have obviously created a more flexible policy space than is usually available for agricultural issues. This environment could facilitate new and inventive farm programs, which would be particularly welcomed by those agricultural producers in the world disadvantaged by US domestic support. However, the uncertainty and lack of precedence for the situation biofuels has precipitated in farm policy may cause policymakers to rely on familiar, if less progressive, farm programs.

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