POLICY PENNINGS

By Daryll E. Ray

Biobased fuels: Could their growth have an impact on crop agriculture?

Clearly, too many acres are being devoted to crop production to generate acceptable market-based net returns. In the past, commodity programs would kick in with an acreage set aside program but there is no authority for that under current legislation. And besides that, farmers do not like the idea of idling land even if they are paid do so. Farmers like to farm.

So let us suppose that a nonfood crop could be grown on grain, oilseed, and cotton acreage that is currently in excess. Further suppose that by transferring land to this crop a renewable source of energy becomes available, prices of traditional crops increase and government expenditures for farm programs are drastically reduced.

Of course, production and utilization of a new crop does not occur without appropriate technologies and infrastructure in place. So while we are supposing, lets also suppose:

- Co-fired electric power generating facilities are prepared to burn bioenergy crops as fuel along with their current fuels of coal, oil, and refuse derived fuel.
- The potential emissions problems of burning bioenergy crops have been solved.
- The logistics problems of transporting bioenergy crops to conversion sites have been solved.
- Farmers would be able to receive a farmgate price of $40 per dry ton (/dt) ($2.58/Mbtu) for switchgrass.
- Alternatively, industrial scale plants are online that are capable of converting bioenergy crops like switchgrass to ethanol for use as a liquid fuel.

Given those assumptions, what would have been the impact of dedicated bioenergy crop production on crop returns? Would farmers have been better off? And, what would have been the impact on government expenditures?

Dr. Daniel De La Torre Ugarte of our Agricultural Policy Analysis Center here at the University of Tennessee recently looked at just that scenario and came up with some interesting results. De La Torre Ugarte has been involved in bio-based fuels research in conjunction with the Department of Energy's Bioenergy Feedstock Development Program at the Oak Ridge National Laboratory. His research has focused on the economic feasibility of growing biomass crops for energy production and analyzing the impact of such production on crop agriculture.

Using the POLYSYS modeling system, De La Torre Ugarte looked at the impact of bioenergy crop production on the crop years 1996 through 2000. His resulting analysis suggested that, at a farmgate price of $40/dt, 22.23 million acres could profitably be devoted to the production of switchgrass, a bioenergy crop, reducing the acreage planted to the major crops. As a result, for the 2000 crop year, corn prices would be $.20 higher, soybeans would be $.90 higher, wheat would be $.48 higher and cotton would be $.05 higher. In each case the resulting crop price would be above the loan rate and farmers would not need to depend upon LDPs for a portion of their income. Switchgrass is a perennial and takes three years to reach full production. For this analysis he assumed that switchgrass production began in 1996 and achieved full production in 1998.

On average, over the five years 1996-2000, the net market returns derived from the sale of the eight major crops is $21.5 billion. If the bioenergy crop switchgrass had been produced on the 22.23 million acres, the net market returns for the eight major crops would have increased to $25.1 billion. In addition, producers would have received a net of $657 million from the sale of bioenergy crops.

As for government payments, the average annual LDP payments would have totaled $39 million instead of an actual average annual expenditure of $1.888 billion, saving the federal government an average of $1.849 billion per year. The government could then have used the LDP savings to purchase the switchgrass from the farmers, given the switchgrass to the utilities FREE and still saved more than $1 billion over the five year period. In looking at this analysis it should be remembered that the years 1996-2000 include both years of high crop prices and low crop prices.

If switchgrass would have been in full production in 1996, the subsidy to the utilities could have been $18.10/dt with no additional net cost to the federal government. This level of subsidy would result in a farmgate cost to the utilities of $21.90/dt or $1.41/Mbtu (plus transportation costs from farm to utility).

To put this in perspective one might note that, with the cold temperatures and additional pressures on natural gas supplies, the spot price at the Henry Hub, Louisiana quadrupled to $9.95/Mbtu on January 5, 2001. During the years 1997 through 1999, spot prices at the Henry Hub ranged from a high of $3.88/Mbtu on December 10, 1997 to a low of $1.03/Mbtu on December 4, 1988. Most of the time the price stayed between $2.00 and $3.00/Mbtu.

The results of De La Torre Ugarte's study suggest that, while we may not have all of the conditions in place right now to begin commercial production, bioenergy crops provide an option worth looking at. Certainly it indicates that bioenergy crop production shows merit as a potential component of long-term agricultural policy.

What is important about this analysis is that it shows what could happen if we could find a non-food crop that could profitably be planted on current U.S. farmland. Rather than using a land retirement program and paying farmers not to farm, farmers could use that land to produce energy crops. Because bioenergy crops are perennials and take several years to establish, they offer the possibility of taking some land out of production for the mid-term while preserving the possibility of return-

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ing it to crop production if we should experience a long-term food shortage.

In August 1999, President Clinton took a step in this direction by issuing Executive Order 13134: "Developing and Promoting Biobased Products and Energy." The Western Area Power Administration website reports on this order saying, "The order aims to triple America's use of bioenergy and biobased products by 2010, generating up to $20 billion a year in new income to farmers and rural communities." In June 2000, Congress provided additional support for the initiative by adopting Title III: The Biomass Research and Development Act of 2000 as a part of the Agricultural Risk Protection Act of 2000.

Daryll E. Ray holds the Blasingame Chair of Excellence in Agricultural Policy, Institute of Agriculture, University of Tennessee, and is the Director of the UT's Agricultural Policy Analysis Center. (865) 974-7407; Fax: (865) 974-7298; dray@utk.edu; http://apacweb.ag.utk.edu/.