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Did He Say Switchgrass ?

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CORNHUSKER ECONOMICS

Did He Say *Switchgrass* ?

Market Report	Yr Ago	4 Wks Ago	2/10/06
<u>Livestock and Products,</u>			
<u>Weekly Average</u>			
Nebraska Slaughter Steers, 35-65% Choice, Live Weight	\$88.85	\$92.04	\$88.34
Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb	130.40	138.95	139.47
Nebraska Feeder Steers, Med. & Large Frame 750-800 lb	105.77	113.48	112.86
Choice Boxed Beef, 600-750 lb. Carcass	146.60	154.06	145.92
Western Corn Belt Base Hog Price Carcass, Negotiated	64.69	50.37	58.75
Feeder Pigs, National Direct 45 lbs, FOB	63.45	64.54	54.26
Pork Carcass Cutout, 185 lb. Carcass, 51-52% Lean	71.27	61.36	57.80
Slaughter Lambs, Ch. & Pr., 90-160 lbs., Shorn, Midwest	109.00	79.00	79.00
National Carcass Lamb Cutout, FOB	260.37	230.80	219.71
<u>Crops,</u>			
<u>Daily Spot Prices</u>			
Wheat, No. 1, H.W. Imperial, bu	3.33	*	3.95
Corn, No. 2, Yellow Omaha, bu	1.79	1.89	1.91
Soybeans, No. 1, Yellow Omaha, bu	5.33	5.42	5.41
Grain Sorghum, No. 2, Yellow Columbus, cwt	2.46	2.93	2.79
Oats, No. 2, Heavy Minneapolis, MN , bu	1.87	2.14	2.05
<u>Hay</u>			
Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton	115.00	130.00	130.00
Alfalfa, Large Rounds, Good Platte Valley, ton	62.50	65.00	65.00
Grass Hay, Large Rounds, Good Northeast Nebraska, ton	57.50	52.50	52.50
* No market.			

Yes, in his recent state of the union address, President Bush said, "We will also fund additional research in cutting-edge methods of producing ethanol, not just from corn but from wood chips and stalks or *switchgrass*. Our goal is to make this new kind of ethanol practical and competitive within six years."

In Nebraska we have heard much in the past year about the stampede to build more corn ethanol plants, but even in Nebraska, not much has been heard about switchgrass. Here is more background.

Why Biofuels?

Biomass feedstocks for energy production have become important in U.S. energy policy for three reasons: they could reduce our dependence on non-renewable petroleum stocks (foreign imports in the short-run, limited supplies in the long-run); they could reduce our emissions of greenhouse gases (GHG's); and they could add an economic boost to farm communities.

What are the Policy Goals for Biofuels?

The Energy Policy Act of 2005 (EPACT) established a renewable fuels standard for the year 2012 that renewable sources should contribute 7.5 billion gallons of transportation fuel, compared to 3.4 billion gallons in 2004 (2 percent of all transportation fuel, essentially all ethanol). Of this standard, 0.25 billion gallons is to come from cellulosic biomass, such as switchgrass and cornstalks.

U.S. grain ethanol production capacity will probably reach 5 billion gallons this year. (Biodiesel, another

biofuel, constitutes about .01 percent of current fuel supplies). Current cellulosic ethanol production capacity, on the other hand, is essentially zero.

Are These Biofuels Competitive?

Grain ethanol is currently very competitive, even without subsidies, which are substantial. Current estimates for the cost of ethanol processing are in the vicinity of \$.60/gallon, plus the feedstock - about a quarter of a bushel of net corn input (about a third of the 0.37 bushel of corn processed for a gallon of ethanol is returned as livestock feed, where it has about the same value as corn). At the current corn price, about \$2.00/bu, this feedstock is worth \$0.50, for a total cost of around \$1.10 per gallon. Wholesale ethanol price at Omaha averaged about \$1.80/gallon in 2005.

No one knows when or if ethanol from switchgrass will be competitive. Recent studies here at the University of Nebraska-Lincoln have shown that Great Plains farmers should be able to produce switchgrass for \$40/t (farm gate), and guesses are that 80-100 gallons of ethanol per ton can be extracted, for a feedstock cost possibly as low as \$0.50/gallon - about the same as corn. But conversion of cellulose to ethanol is still experimental. The National Renewable Energy Laboratory estimates that biorefineries will ultimately achieve a conversion cost of \$0.60/gallon,¹ and if so, switchgrass will be a competitive fuel source.

Would Biofuels Reduce Fossil Energy Use?

A recent review article in the journal *Science* calculates that grain ethanol requires about 88 percent as much fossil energy (including all energy use related to corn production) as does the gasoline that it replaces.² Studies at UNL put that figure at 70 percent.³

The *Science* article calculates that switchgrass ethanol would require only 9 percent as much fossil energy as gasoline, because so little energy is required in switchgrass production.

What Are Biofuel Impacts on Greenhouse Gases?

The *Science* article reports that substituting a gallon of grain ethanol for a gallon of gasoline reduces greenhouse gas emission by 14 percent, while a gallon of switchgrass ethanol would reduce them by 88 percent. These reductions occur because biomass production extracts carbon dioxide from the atmosphere, which is then returned to the atmosphere when ethanol is burned, resulting in new greenhouse gasses only to the extent that fossil fuels are used in ethanol production. (The burning of fossil fuels pumps carbon dioxide into the atmosphere from its previous sequestration underground).

Will Production of Biofuels Reduce Food Supplies?

No doubt it will. It is possible that some switchgrass would be produced on idle land (CRP land, for example), and that cornstalks could be converted to ethanol without losses in sustainable crop yields. But the mainstay biofuel, grain ethanol, removes corn from the food production chain. Today about 14 percent of U.S. corn production goes to ethanol, and the renewable fuels mandate will require an additional 14 percent or so. Corn price will no doubt rise as this happens, causing more corn to be produced, but the net result will be a reduction of corn and alternative crops entering the food production chain.

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(Dr. Perrin is currently on sabbatical. If you wish to reach him about this article please email him).

¹ www.nrel.gov/docs/fy02costi/32438.pdf

² Farrell, et al., *Science* 311:506-508, 27 Jan 2006.

³ Walters, in *The Ethanol Industry in Nebraska*, p3, at ianrnews.unl.edu/timelyTopics/ethanol.pdf