

Biofuels: Implications for Prices and Production

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Executive Summary

- Ethanol mandated to reduce dependence on imported petroleum.
- Other benefits include economic development, reduction of greenhouse emissions, and support of farm incomes.
- Ethanol production is highly subsidized and the domestic industry is protected by an import tariff.
- High crude oil prices contribute to the success of ethanol.
- Ethanol production will exceed 5 billion gallons this year and 6 billion in 2007, using 2.15 billion bushels of corn in the 2006-07 marketing year.
- Ethanol demand will likely push corn prices to a higher level for an extended period.
- U.S. corn acreage will increase, but supplies will remain tight.
- Higher corn prices likely negatively impact non-fuel users, contribute to higher land values/rents, and encourage an increase in foreign production.
- Strong ethanol demand may result in significant policy changes, including income supports, trade, and conservation.
- To date, the contribution of ethanol production to the U.S. fuel supply has been modest.
- Biofuels mandates and subsidies are expected to remain, with Congress expressing a lot of support for biofuels.
- Support could be reconsidered if corn prices become punitive to other users, food prices increase, or society becomes disappointed with its contribution to the fuel supply.



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Why Ethanol?

Convert relatively abundant **domestic** sources of energy into a substitute for **imported** petroleum



Energy Conversion

Natural Gas

Electricity

Petroleum

Coal

Methane

Sunlight

Ethanol

DDGs

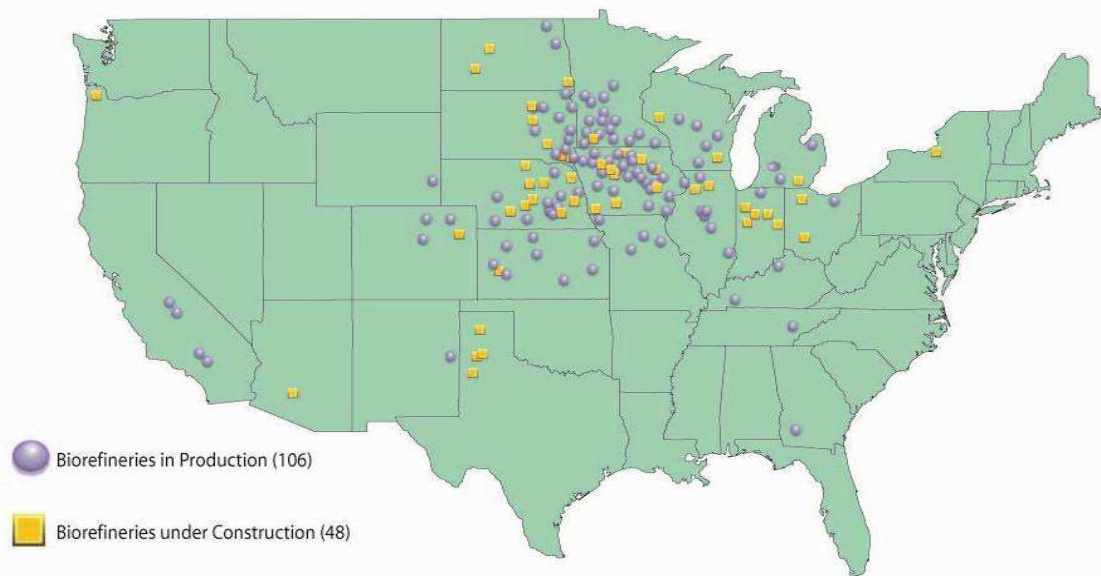
Other Benefits

- Economic Development
- Reduce Greenhouse Emissions
- National Security
- Support Farm Income

for all the right reasons



U.S. Ethanol Biorefinery Locations

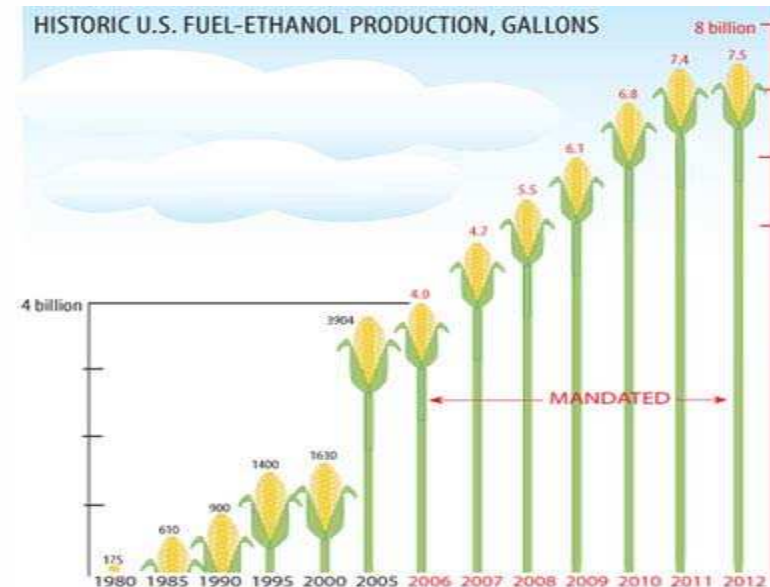


Source: Renewable Fuels Association

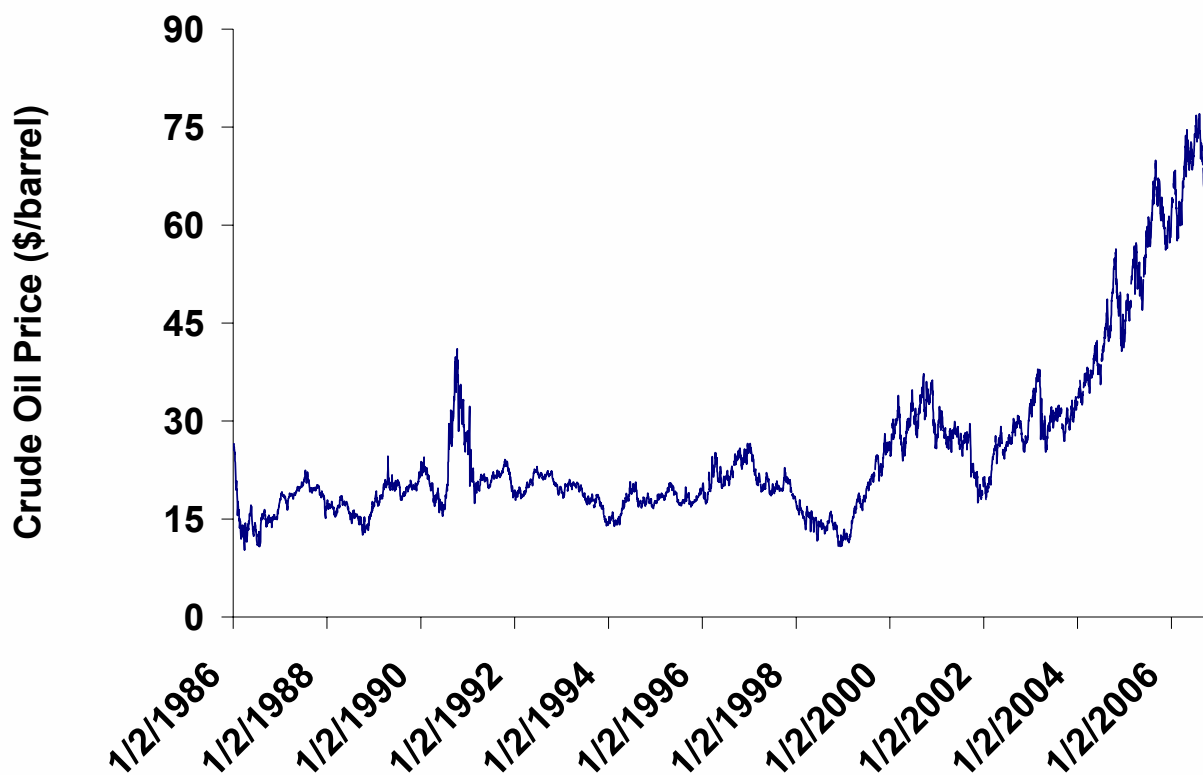
Economics of Ethanol

Currently economically feasible due to:

- \$.51/gallon blender tax credit
- \$.54/gallon import tariff
- High crude oil prices
- Mandates

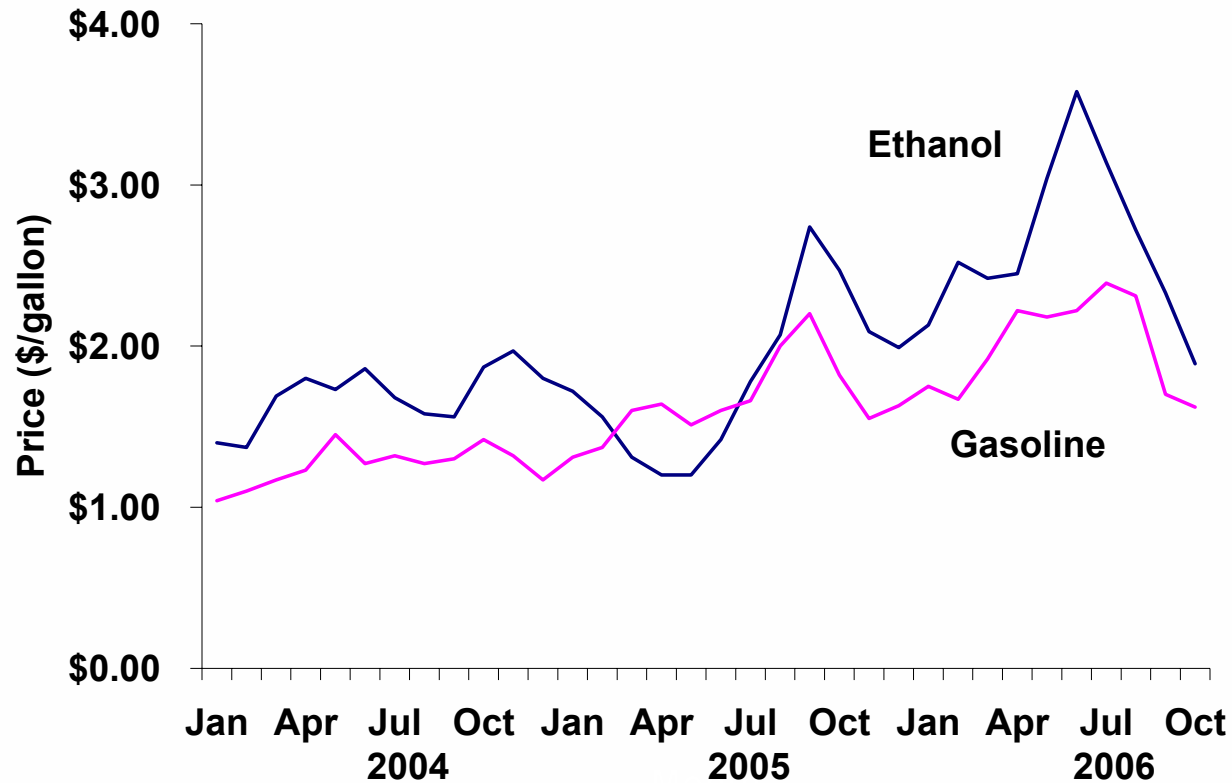


Crude Oil Prices, Cushing, OK WTI Spot Price, Jan. 2, 1986 – Nov. 21, 2006



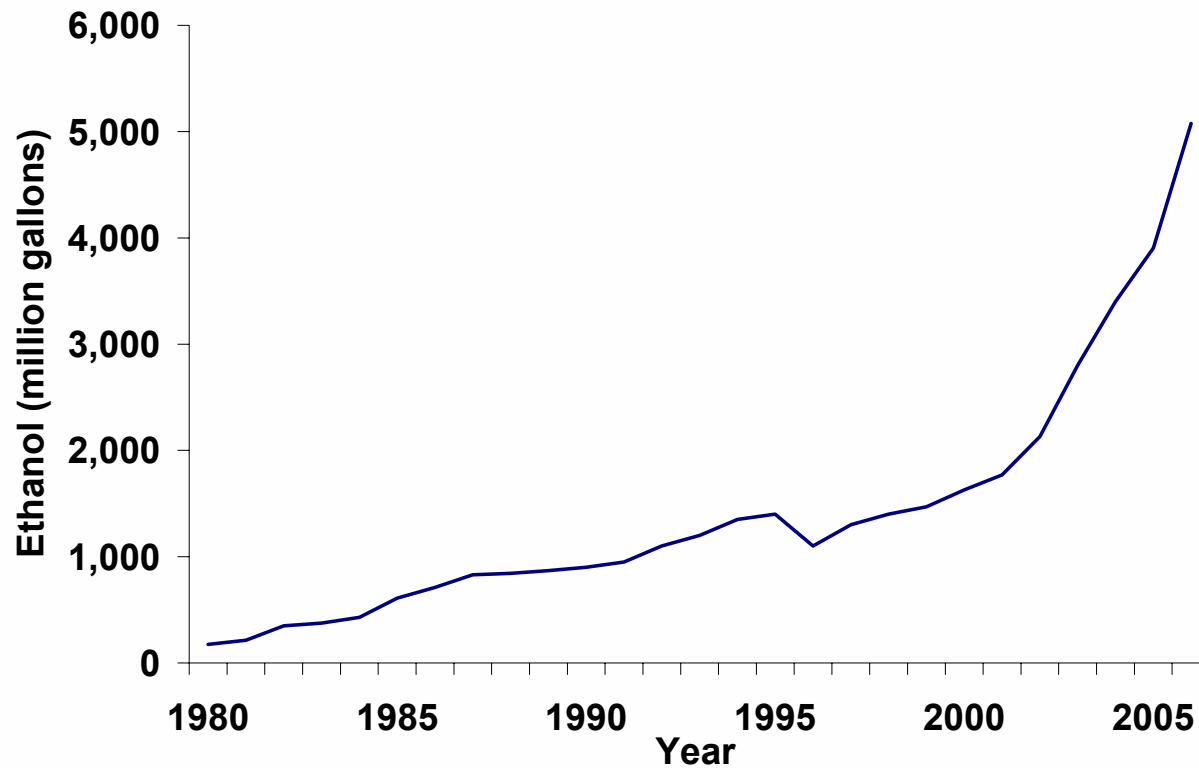
Source: U.S. Department of Energy, Energy Information Administration

Ethanol and Unleaded Gasoline Prices, F.O.B. Omaha, Nebraska, January 2004 - October 2006



Source: Nebraska Ethanol Board; Nebraska Energy Office

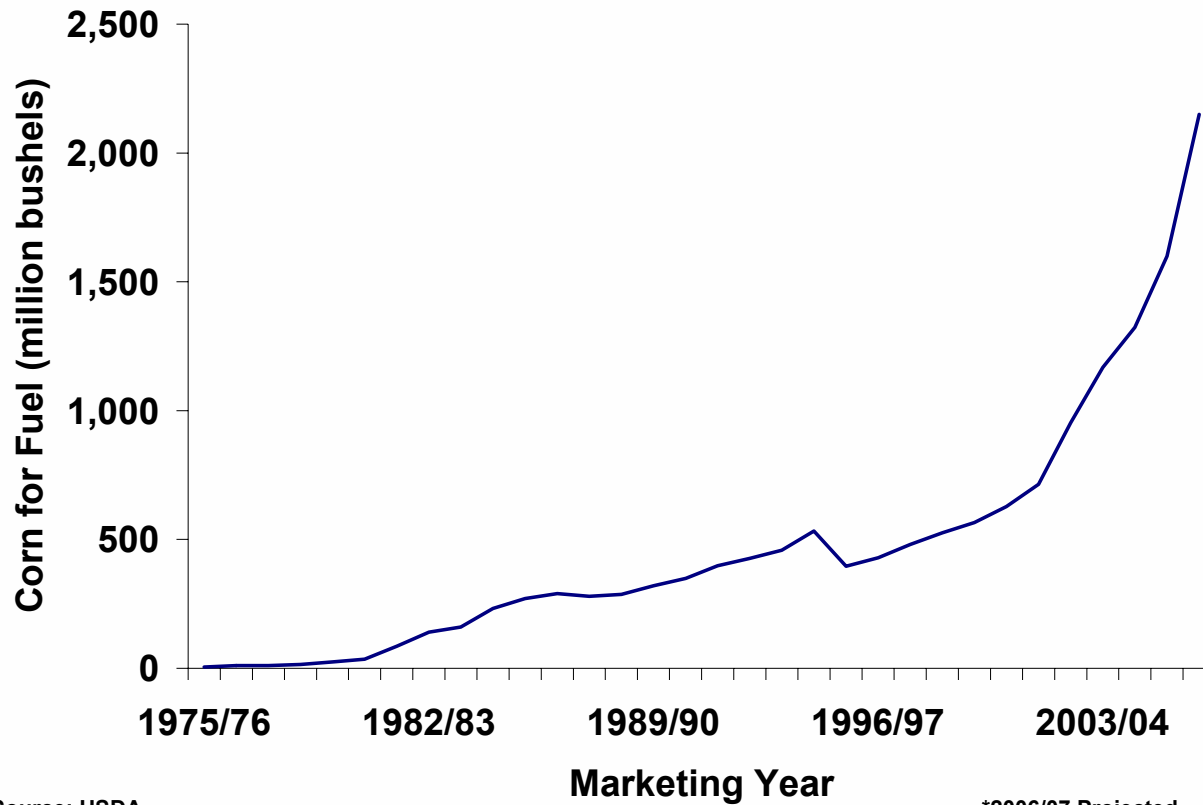
U.S. Ethanol Production, 1980-2006



Source: Renewable Fuels Association and Original Calculations

*2006 Projected

U.S. Corn for Fuel Use, 1975/76-2006/07



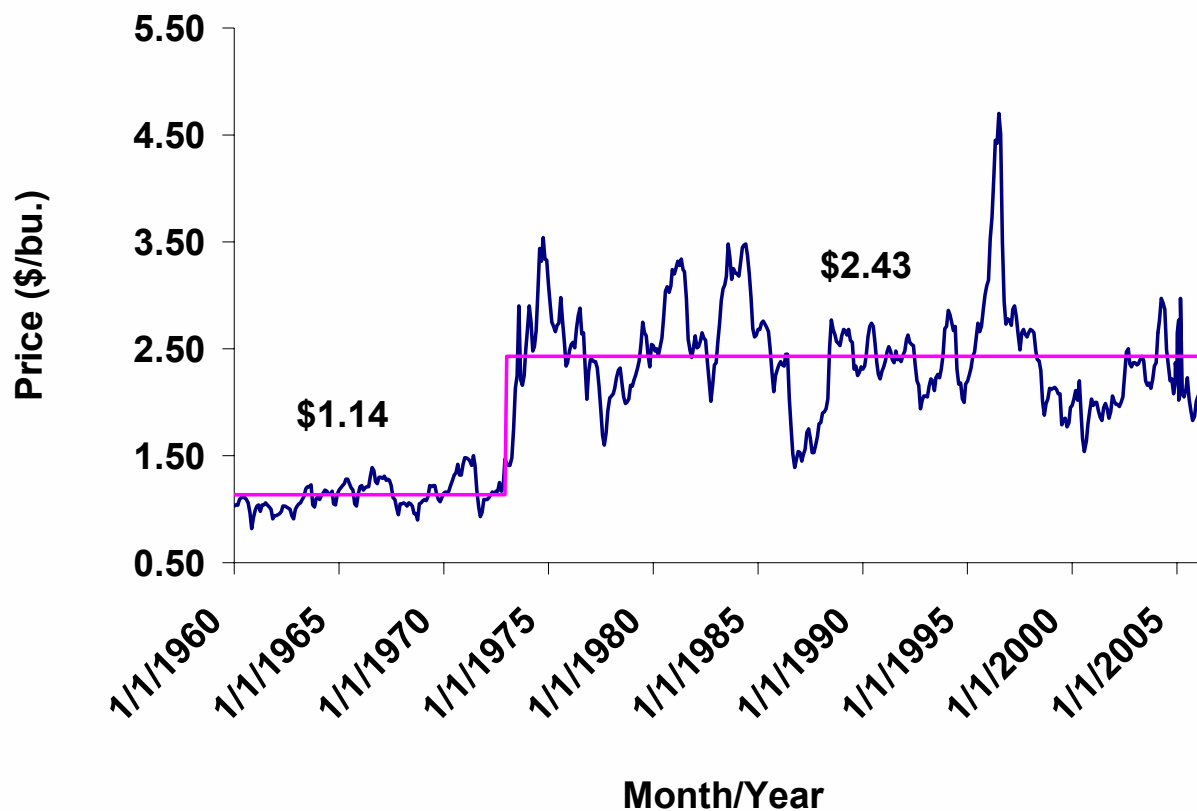
Source: USDA

*2006/07 Projected

Implications

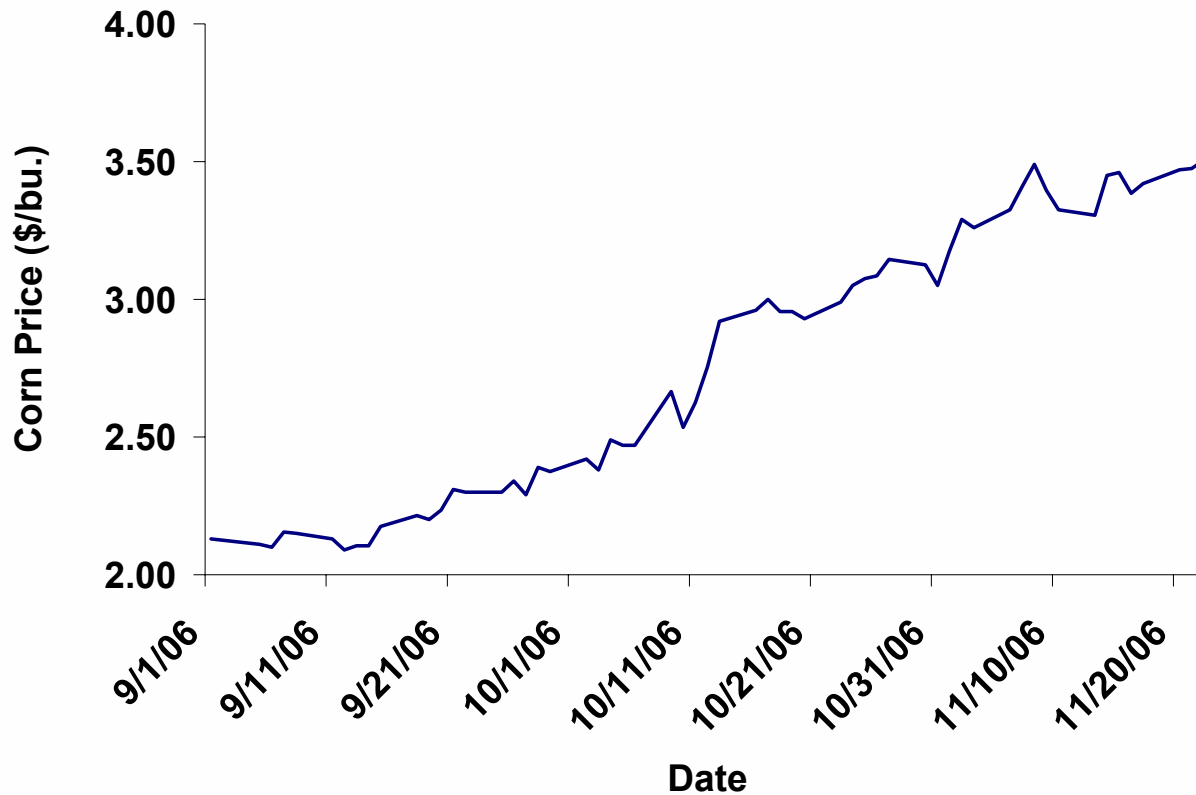
- Prices** a new higher plateau?
impact on other users?
impact on land values/rents?
- Supply** will corn acreage increase?
will yields continue to increase?
- Stocks** will a reserve be required?
- Policy** income supports, trade, conservation
- Fuel Supply** a significant contribution?

Monthly Farm Price of Corn in Illinois, January 1960-September 2006



Source: USDA

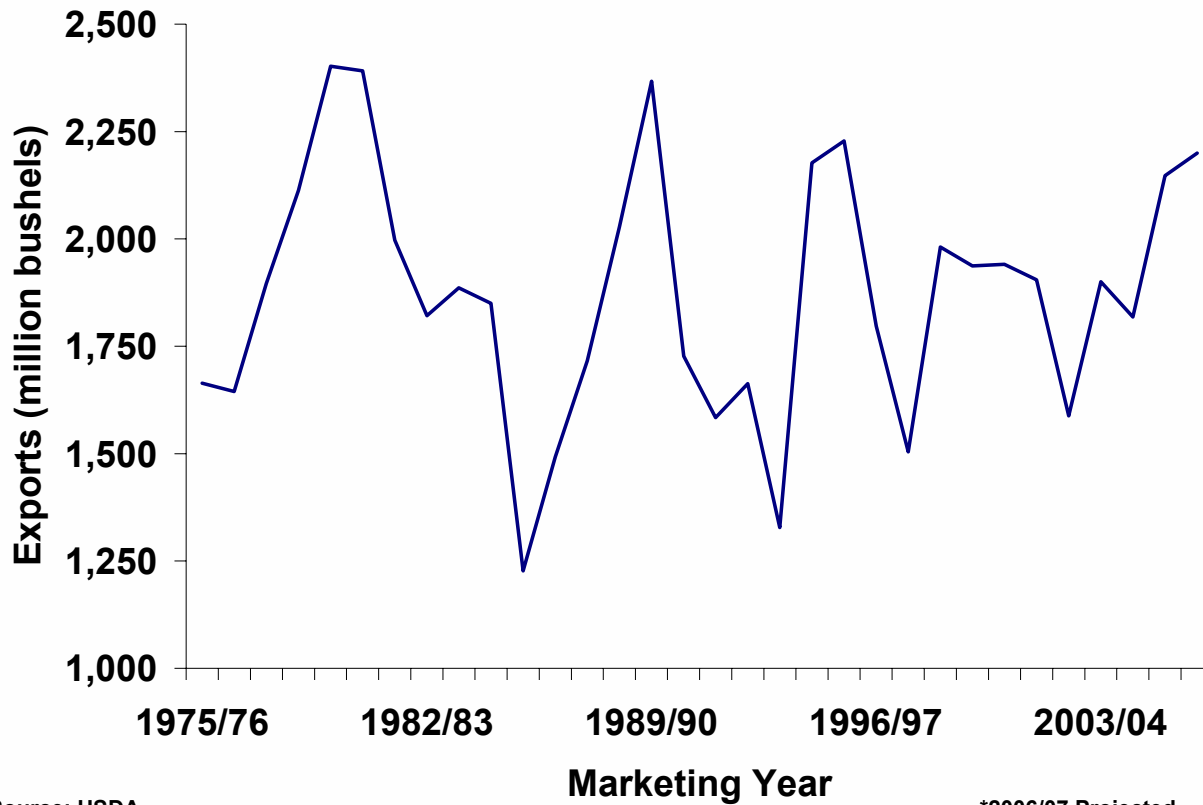
Central Illinois Corn Price, September 1-November 22, 2006



Function of Prices

- Make sure all acres are planted
- Bring CRP back into production?
- Shift acres to corn in the US
- Encourage foreign production
- Limit expansion of non-fuel uses of crops

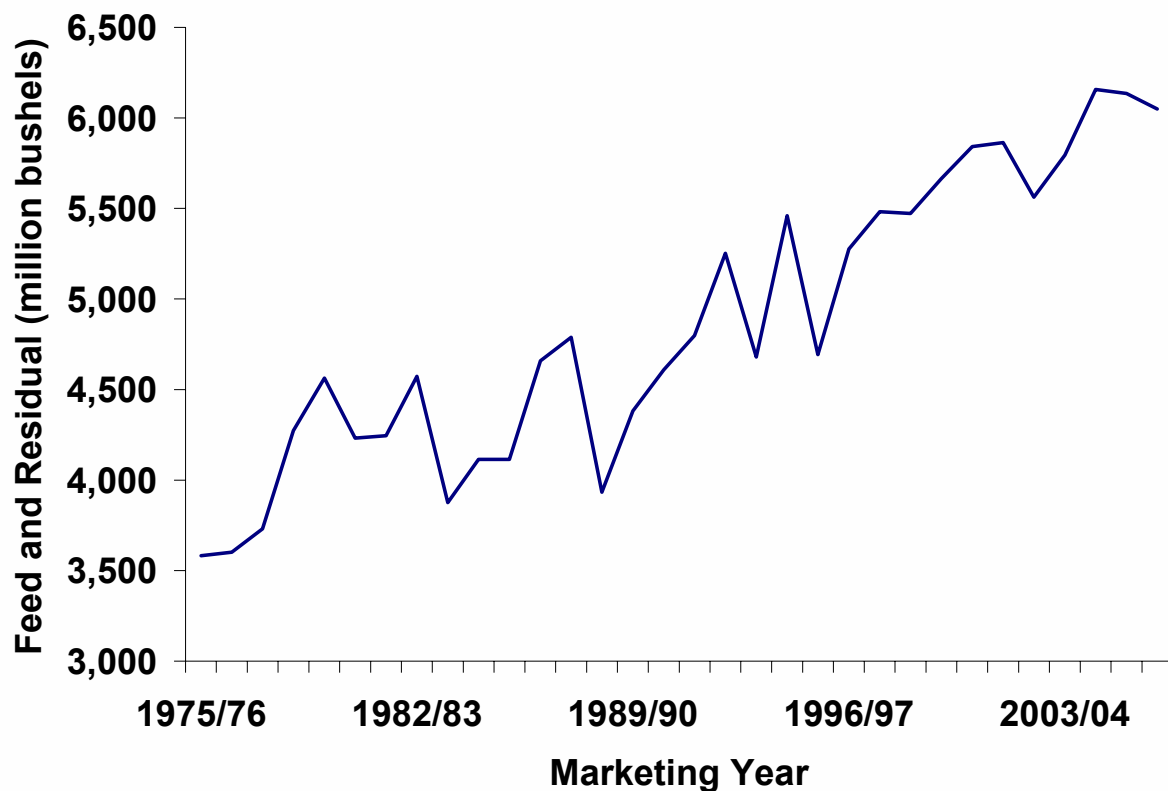
U.S. Corn Exports, 1975/76-2006/07



Source: USDA

*2006/07 Projected

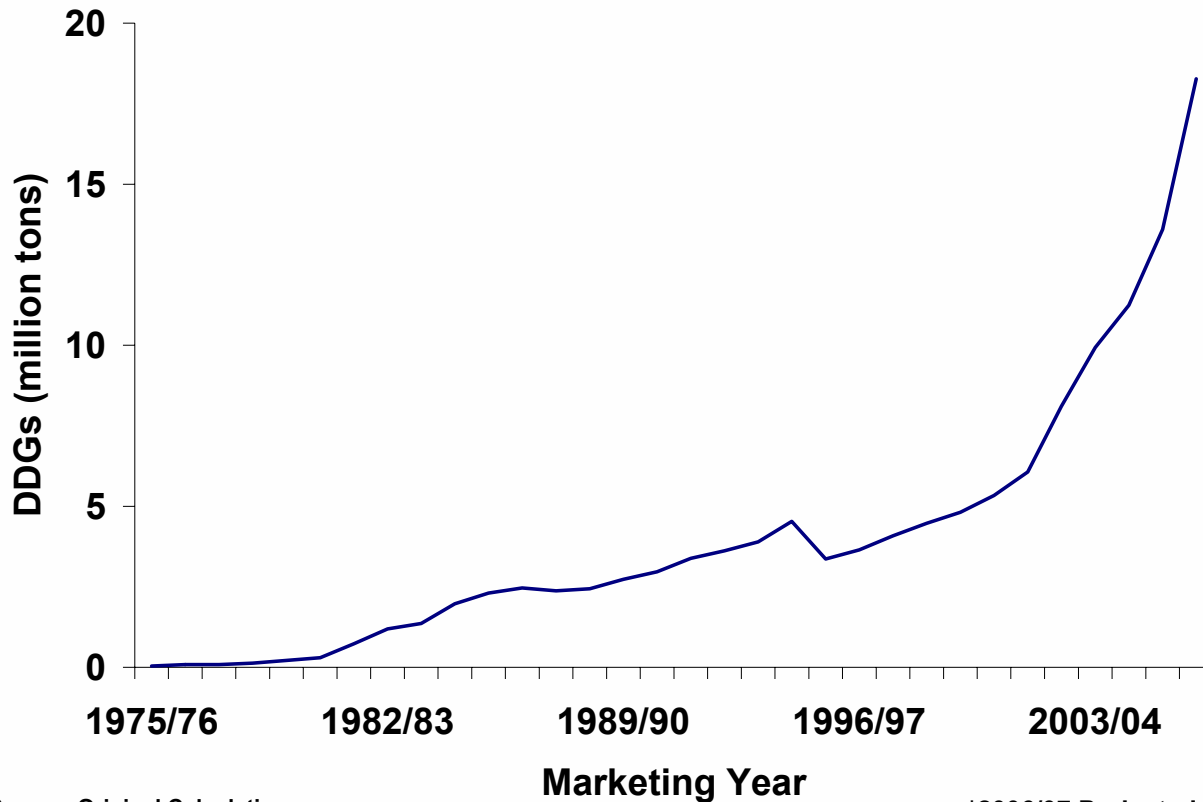
U.S. Corn Feed and Residual Use, 1975/76-2006/07



Source: USDA

*2006/07 Projected

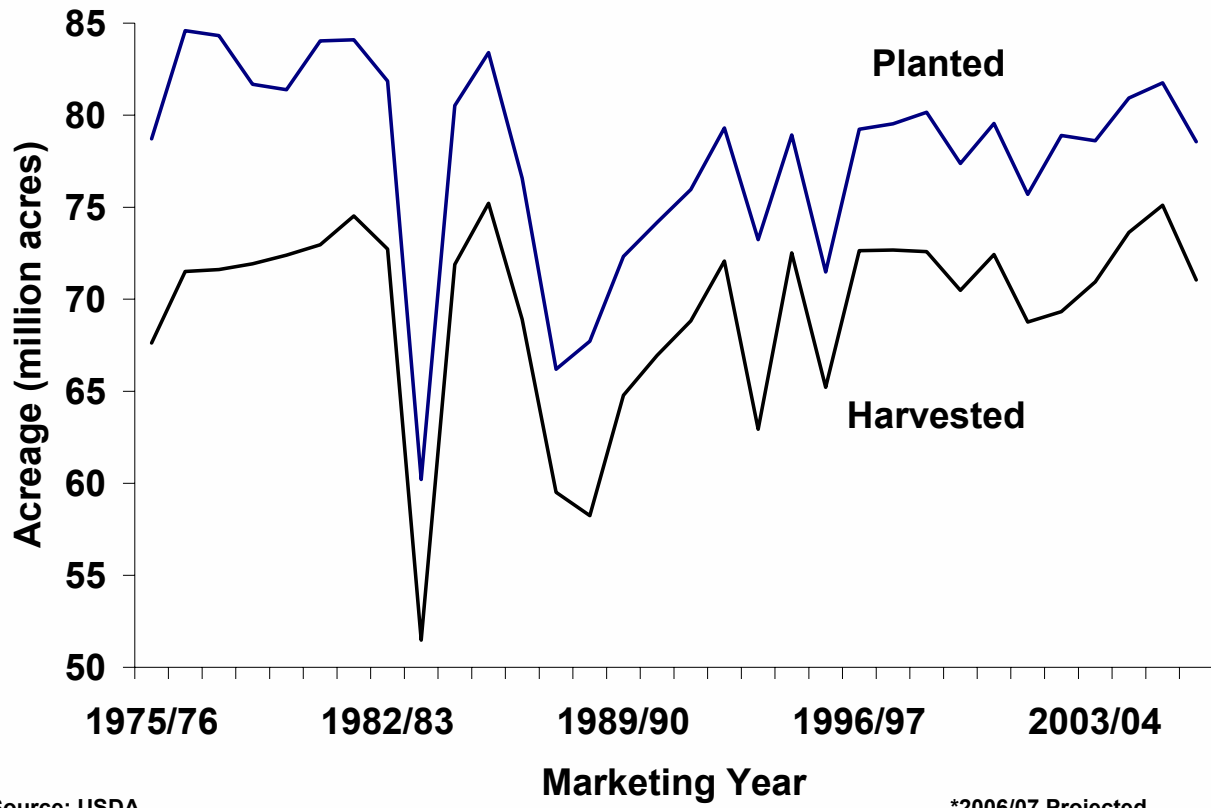
U.S. Dried Distillers Grain (DDG) Production, 1975/76-2006/07



Source: Original Calculations

*2006/07 Projected

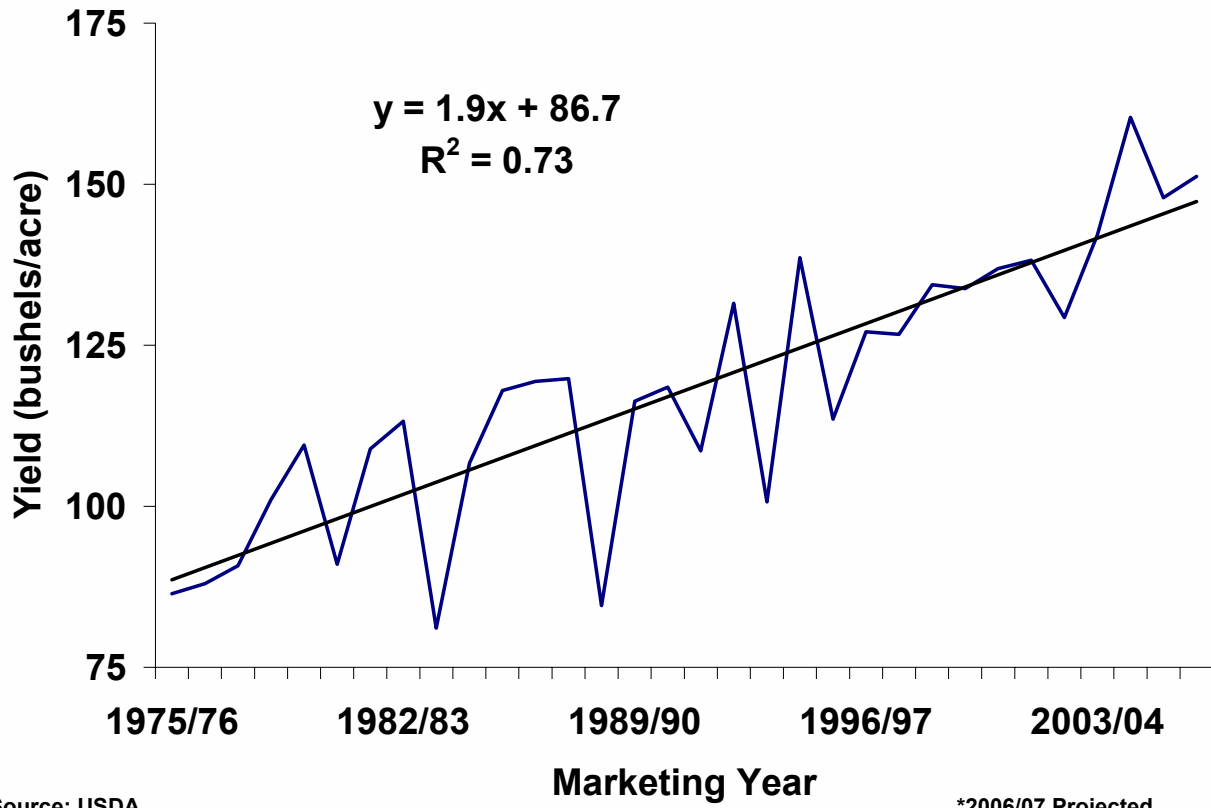
U.S. Corn Acreage, 1975/76-2006/07



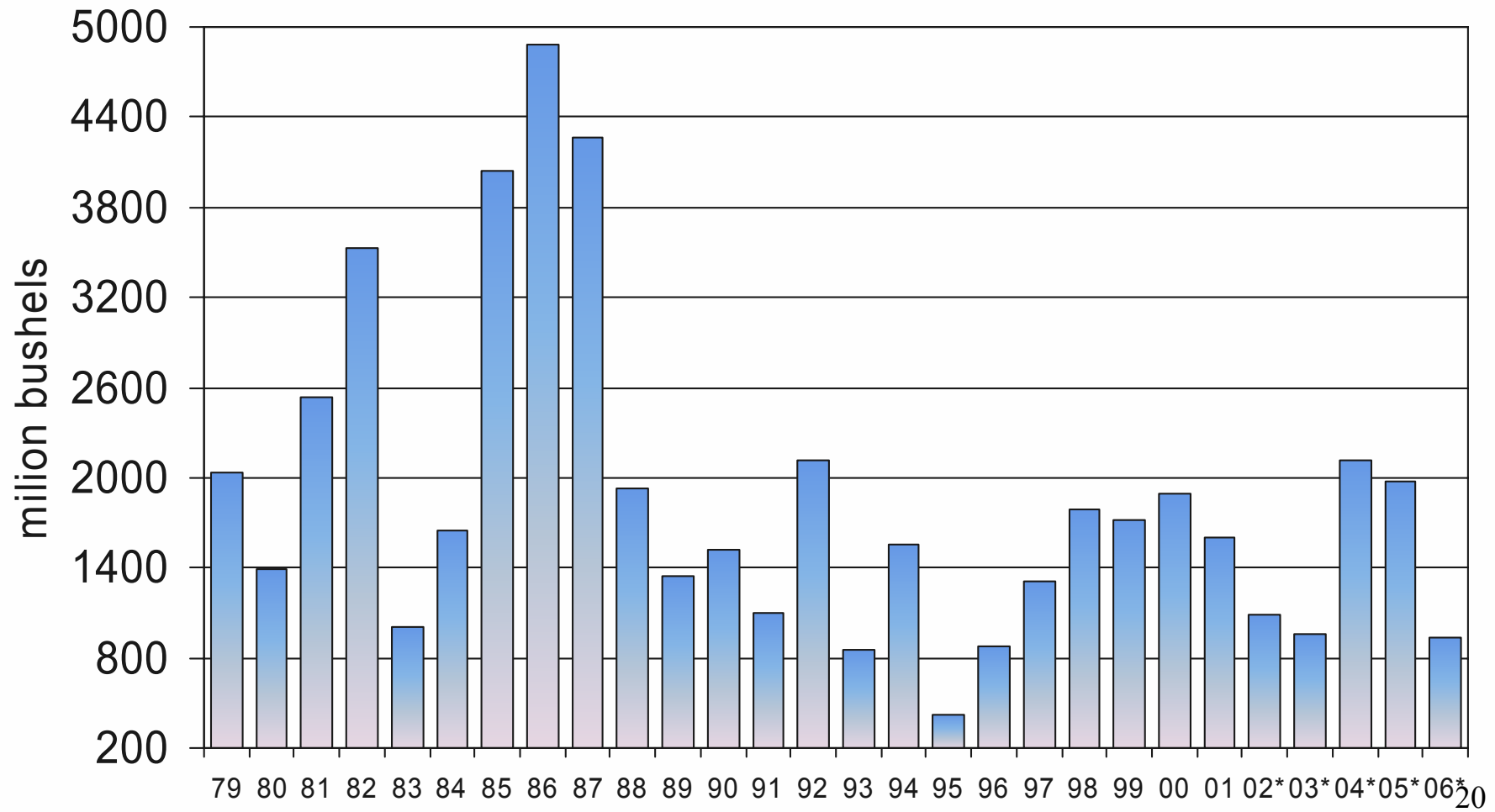
Source: USDA

*2006/07 Projected

U.S. Corn Yields, 1975/76-2006/07



Ending Stocks of Corn



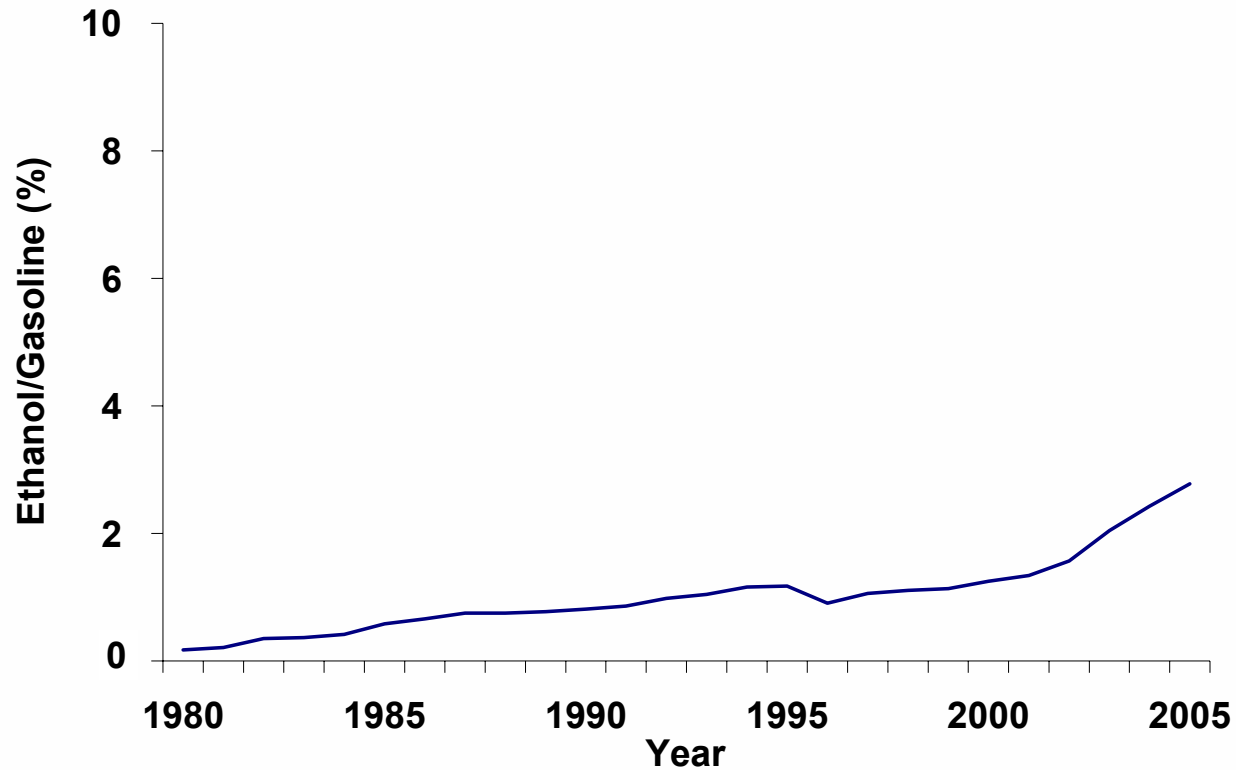
Policy Implications

- Income supports not needed?
- Alter CRP contracts?
- Allow more ethanol/sugar imports?
- Soil and water conservation?
- Mandated rationing plans?
- Re-think biofuel subsidies?

Contribution to Fuel Supply

- 6 billion gallons of ethanol requiring about 2.2 billion bushels of corn
- US consumes 140 billion gallons of unleaded/yr
- Ethanol = 2/3 BTUs of unleaded gasoline
- 6 billion gallons of ethanol = 4.02 billion gallons of unleaded, or approximately 3 percent of gasoline supply

U.S. Ethanol Production Relative to Unleaded Gasoline Use, 1980-2005



Source: Renewable Fuels Association; U.S. Department of Energy, Energy Information Administration

Is the Energy Balance Improving?

USDA- Dry Milling	<u>1996</u>	<u>2001</u>
- Net energy w/o co-product	+11%	+10%
- Net energy with co-products	+37%	+77%

* Difference is in the magnitude of energy credit for co-products

*50% energy balance, means ethanol's net contribution to fuel supply is smaller than gross contribution (3%)