Impacts of Biofuel Production on Minnesota Agricultural Transportation

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TODAY’S TOPICS

- Ethanol In Minnesota and the US
- The Blend Wall, Renewable Fuel Standards, and the Impact of RINS (Renewable Identification Numbers) on Ethanol
- Changes in Minnesota’s Cropping Patterns 1930-2012
- Changes in Twin Cities Barge Traffic 1965-2010
Ethanol In Minnesota and the US
Ethanol In Minnesota

- Minnesota has about 21 operating ethanol plants
- Capable of producing over 1.1 billion gallons of ethanol and 3.3 million tons of high protein livestock feed annually (fifth largest in nation)
- Using over 400 million bushels of corn at capacity (1/3 of MN typical production)
- Other by-products include corn oil and CO2
Ethanol In the US

• Over 200 plants in 28 states produced almost 14 billion gallons of ethanol in 2012
• There are ethanol plants in 28 states
• The $.45 a gallon blending credit no longer exists. There is no longer an import tariff
• Some US corn starch ethanol is exported
• Some ethanol is imported (Sugar cane ethanol from Brazil)
Ethanol In the US (2)

• US corn starch and Brazilian sugar cane ethanol compete in the world market. The competitive advantage depends on location, logistics, and corn and sugar prices.

• US corn starch ethanol is competitive with US gasoline when corn is $4.00 a bu and crude oil is $60.00 a bbl. or corn is $6-7 a bu and crude is $100 a bbl.

• Current corn price is $6.35-6.70
• Crude is $96
• 2013 fall corn prices are $5-5.50
• Crude Futures are $95
US ETHANOL PRODUCTION IN MILLION GALLONS

Ethanol Production

YEAR


Million Gallons

0  1000  2000  3000  4000  5000  6000  7000  8000  9000  10000  11000  12000  13000  14000  15000  16000

Million Gallons
The Blend Wall
13.5 Billion Gallons of Ethanol
The Blend Wall

• The US gasoline distribution system has standardized on the EPA approved 10% ethanol blend. (E10)
• Total US Gasoline consumption is 130 to 140 billion gallons annually and is no longer increasing
• Therefore the maximum allowable ethanol that can be used is in auto fuel is about 13.5 billion gallons - THE BLEND WALL

• Current US Ethanol production capacity is over 15 billion gallons
• Quantities of ethanol used in E15 and E85 blends is not significant due to the limited number of distribution facilities
Renewable Fuel Standards (RFS)
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- Renewable Fuel Standards (RFS) were established in the Energy Policy Act of 2005 and modified by the Energy Independence and Security Act 2007 (ESIA)

- The Acts specified the volumes of renewable fuels that must be used each year for transportation fuel, home heating or jet fuel. The volumes increased from 8 billion gallons in 2008 to 16.55 billion gallons in 2013 and eventually to 36 billion gallons in 2022.

- The Acts require the EPA to establish percentage standards annually for each category of renewable fuel so the specified volumes will be fulfilled. The EPA enforces these volume requirements on obligated parties. (Petroleum refiners and importers) through the assignment and management of “RINs. (The EPA has discretionary powers to grant waivers)

- Renewable fuels include Corn Starch Ethanol, Cellulosic Ethanol, Biomass Based Diesel, and “Other Advanced Biofuels”.
Renewable Fuel Mandates

Source farmdocdaily Jan 30 2013
Renewable Fuel Standards (RFS)

• Corn Starch Ethanol share was capped at 13.8 billion gallons in 2013, 14.4 billion gallons in 2014 and 15.0 billion gallons a year for 2015 and thereafter. In hindsight, this exceeds the blend wall. The other categories are not capped.

• The acts specified 100 million gallons of cellulosic ethanol in 2010, 250m in 2011 and 500m in 2012 and 1 billion gallons in 2013. The EPA has used it’s discretionary powers (and a judicial order) to lower the 2013 requirement to 14 million ethanol equivalent gallons.

• The biodiesel mandate is 1.28 million gallons in 2013
Renewable Identification Numbers (RINS)
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• To Fulfill the mandates each gallon of renewable fuel produced or imported in the US is assigned a RIN (Renewable identification number, a 38 digit number that is reported to the EPA to ensure compliance with the RFS mandate).
• RINS are transferable between obligated parties and can be banked or carried over to the next calendar year.
• Active markets exist to trade RINS
• There are separate RINS for each category
  D3 Cellulosic biofuel
  D4 Biomass-based diesel
  D5 Advanced Biofuel
  D6 Renewable Fuel (Includes corn ethanol)
These are Hierarchal in that D3s, D4s, and D5s can be used for renewable fuel D6 RINS but not vice versa

**Significant opportunities exist for arbitrage and fraud**
RINS and the BLENDD WALL

• In 2013 there is a requirement for 16.55 million RINS to meet all mandates but only 13.5 billion of ethanol can be blended into US gasoline
• Make up shortfall with
  a. banked RINS –while they last (About 2 million)
  b. advanced biofuels l.e. Import sugar cane ethanol from Brazil (but this would displace US ethanol !)
  c. Increase biodiesel production
• What will happen in 2015 when 20 million RINs will be required under the RFS ?
RINS and the BLEND WALL -2

- EPA has discretionary powers to adjust quotas
- Cellulosic process is years behind schedule
- Major changes will have to be made to the system by 2015
Changes in Minnesota’s and the US Cropping Patterns 1930-2012

OR FOOD VERSUS FUEL REVISITED
THOUSAND ACRES OF CORN PLANTED IN MINNESOTA
1930 TO 1990 AND 2000 to 2012
CORN YIELDS IN BU PER ACRE IN MINNESOTA 1930 TO 2012
MINNESOTA CORN PRODUCTION
FROM 1930 TO 1990 AND 2000-2012
CORN PRICES IN MINNESOTA FROM 1930 TO 2012
Changes in US Agricultural Export Flows
1967-2012
GRAIN EXPORTS BY PORT RANGE
1967-2012

YEAR

THOUSAND BUSHELS


LAKES
Atlantic
GULF
PACIFIC
INTERIOR
US GRAIN EXPORTS 2007-2012

- **CORN**
- **SOYBEANS**
- **WHEAT**


- 2007: 2,500,000
- 2008: 2,000,000
- 2009: 1,500,000
- 2010: 1,000,000
- 2011: 1,500,000
- 2012: 1,000,000
US WHEAT EXPORTS BY PORT RANGE

- Lakes
- Atlantic
- Gulf
- Pacific
- Interior
Changes in Twin Cities Barge Traffic
1965-2010
TOTAL TWIN CITY BARGE MOVEMENTS

1965 to 1995 and 2000 to 2010

in Thousand Tons
TWIN CITY BARGE MOVEMENTS
1995 to 2010
in Thousand Tons

Receipts
Shipments
TWIN CITY BARGE CORN, BEANS, and WHEAT MOVEMENTS
1965 to 1995 and 2000 to 2010
in Thousand Tons
BARGE MOVEMENTS OF COAL
1965 to 1995 and 2000 to 2010
in Thousand Tons
TWIN CITY SAND, GRAVEL, ROCK MOVEMENTS
1965 to 1995 and 2000 to 2010
in Thousand Tons
Thank You
Questions??

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