

Renewable Fuels Mandate: Does It Make a Difference?

Frayne Olson, PhD

Crop Economist/Marketing Specialist

NDSU Extension Service

ND Agricultural Experiment Station

Dept. of Agribusiness & Applied Economics



Current Situation

- Eight governors have requested the Environmental Protection Agency (EPA) waive the Renewable Fuels Standard (RFS) mandate for corn based ethanol because of the 2012 drought.
 - EPA is currently requesting comments, but decision will not be made until after the election.
 - Policy makers, livestock producers, ethanol processors and corn farmers all have a vested interest in this decision.
-
-

**How would a waiver impact corn
supplies and corn prices?**

Corn Supply & Demand Table

U.S. Corn	2010/2011	2011/2012 (Est)	2012/2013 (Sep)
Planted A.	88.2 Mill. A.	91.9 Mill. A.	96.4 Mill. A.
Harvested A.	81.4 Mill. A.	84.0 Mill. A.	87.4 Mill. A.
Yield/Harvest A.	152.8 bu.	147.2 bu.	122.8 bu.
Begin Stocks	1,708 Mill. Bu.	1,128 Mill. Bu.	1,181 Mill. Bu.
Production	12,447 Mill. Bu.	12,358 Mill. Bu.	10,727 Mill. Bu.
Imports	28 Mill. Bu.	25 Mill. Bu.	75 Mill. Bu.
Total Supply	14,182 Mill. Bu.	13,511 Mill. Bu.	11,983 Mill. Bu.
Feed & Residual	4,793 Mill. Bu.	4,400 Mill. Bu.	4,150 Mill. Bu.
Food, Seed, Ind.	6,428 Mill. Bu.	6,390 Mill. Bu.	5,850 Mill. Bu.
Ethanol	5,021 Mill. Bu.	5,000 Mill. Bu.	4,500 Mill. Bu.
Exports	1,835 Mill. Bu.	1,540 Mill. Bu.	1,250 Mill. Bu.
Total Use	13,055 Mill. Bu.	12,330 Mill. Bu.	11,250 Mill. Bu.
Ending Stocks	1,128 Mill. Bu.	1,181 Mill. Bu.	733 Mill. Bu.

Corn Supply & Demand Table

U.S. Corn	2010/2011	2011/2012 (Est)	2012/2013 (Sep)
Planted A.	88.2 Mill. A.	91.9 Mill. A.	96.4 Mill. A.
Harvested A.	81.4 Mill. A.	84.0 Mill. A.	87.4 Mill. A.
Yield/Harvest A.	152.8 bu.	147.2 bu.	122.8 bu.
Begin Stocks	1,708 Mill. Bu.	1,128 Mill. Bu.	1,181 Mill. Bu.
Production	12,447 Mill. Bu.	12,358 Mill. Bu.	10,727 Mill. Bu.
Imports	28 Mill. Bu.	25 Mill. Bu.	75 Mill. Bu.
Total Supply	14,182 Mill. Bu.	13,511 Mill. Bu.	11,983 Mill. Bu.
Feed & Residual	4,793 Mill. Bu.	4,400 Mill. Bu.	4,150 Mill. Bu.
Food, Seed, Ind.	6,428 Mill. Bu.	6,390 Mill. Bu.	5,850 Mill. Bu.
Ethanol	5,021 Mill. Bu.	5,000 Mill. Bu.	4,500 Mill. Bu.
Exports	1,835 Mill. Bu.	1,540 Mill. Bu.	1,250 Mill. Bu.
Total Use	13,055 Mill. Bu.	12,330 Mill. Bu.	11,250 Mill. Bu.
Ending Stocks	1,128 Mill. Bu.	1,181 Mill. Bu.	733 Mill. Bu.

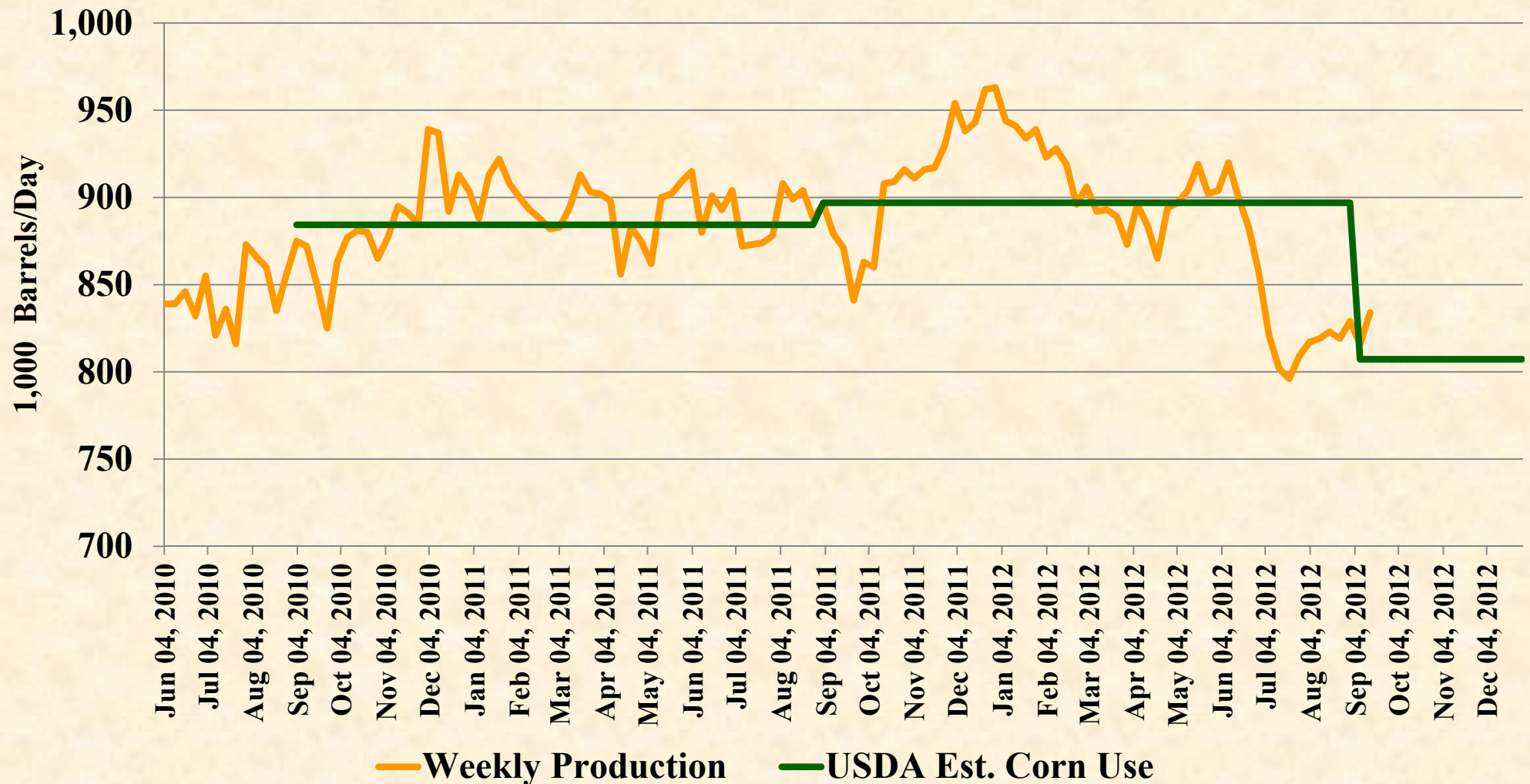
USDA – WASDE – Sep. 12, 2012

Corn Supply & Demand Table

U.S. Corn	2010/2011	2011/2012 (Est)	2012/2013 (Sep)
Planted A.	88.2 Mill. A.	91.9 Mill. A.	96.4 Mill. A.
Harvested A.	81.4 Mill. A.	84.0 Mill. A.	87.4 Mill. A.
Yield/Harvest A.	152.8 bu.	147.2 bu.	122.8 bu.
Begin Stocks	1,708 Mill. Bu.	1,128 Mill. Bu.	1,181 Mill. Bu.
Production	12,447 Mill. Bu.	12,358 Mill. Bu.	10,727 Mill. Bu.
Imports	28 Mill. Bu.	25 Mill. Bu.	75 Mill. Bu.
<i>Total Supply</i>	<i>14,182 Mill. Bu.</i>	<i>13,511 Mill. Bu.</i>	<i>11,983 Mill. Bu.</i>
Feed & Residual	4,793 Mill. Bu.	4,400 Mill. Bu.	4,150 Mill. Bu.
Food, Seed, Ind.	6,428 Mill. Bu.	6,390 Mill. Bu.	5,850 Mill. Bu.
Ethanol	5,021 Mill. Bu.	5,000 Mill. Bu.	4,500 Mill. Bu.
Exports	1,835 Mill. Bu.	1,540 Mill. Bu.	1,250 Mill. Bu.
<i>Total Use</i>	<i>13,055 Mill. Bu.</i>	<i>12,330 Mill. Bu.</i>	<i>11,250 Mill. Bu.</i>
Ending Stocks	1,128 Mill. Bu.	1,181 Mill. Bu.	733 Mill. Bu.

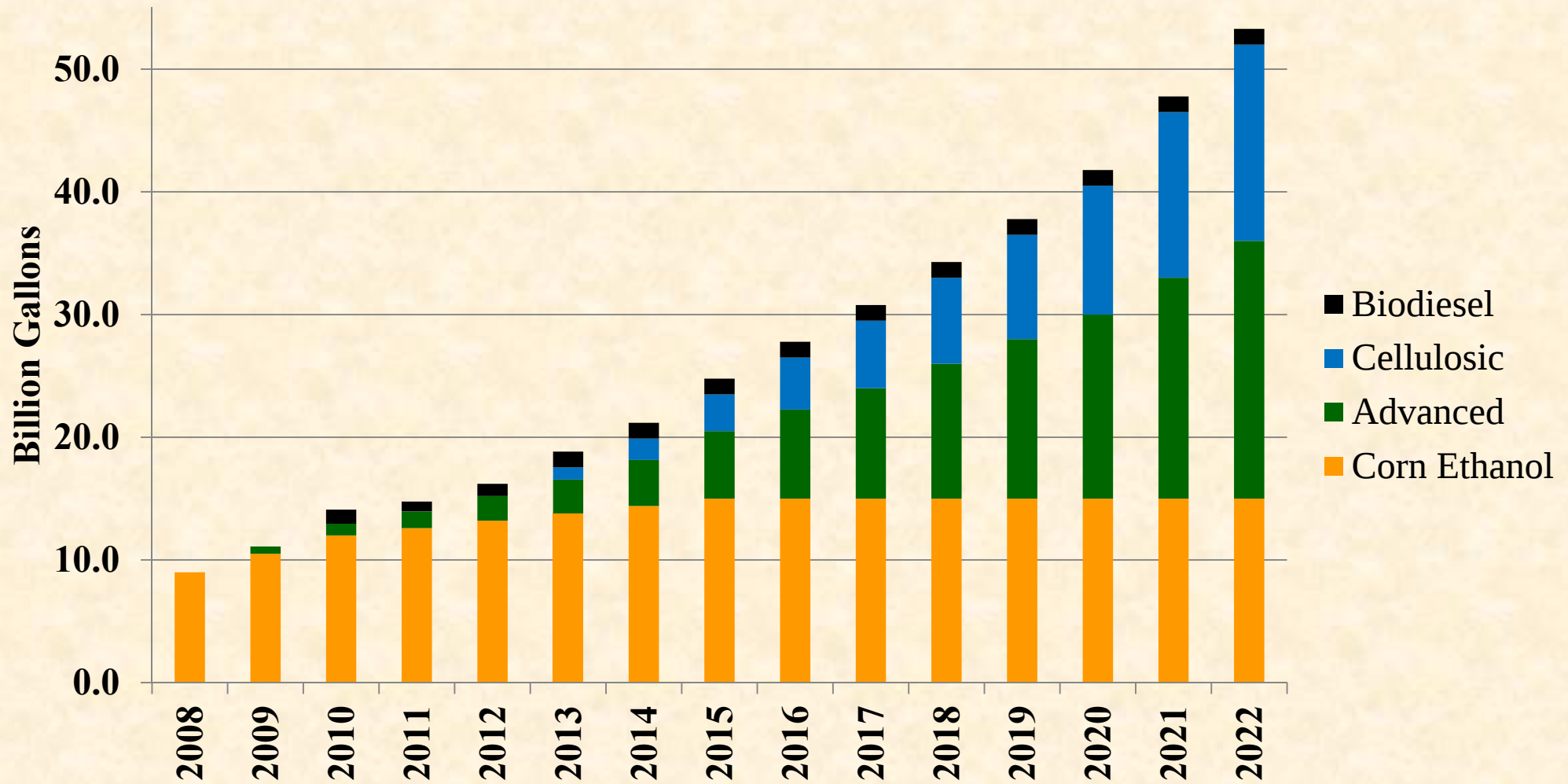
USDA – WASDE – Sep. 12, 2012

Weekly Ethanol Production



EISA 2007

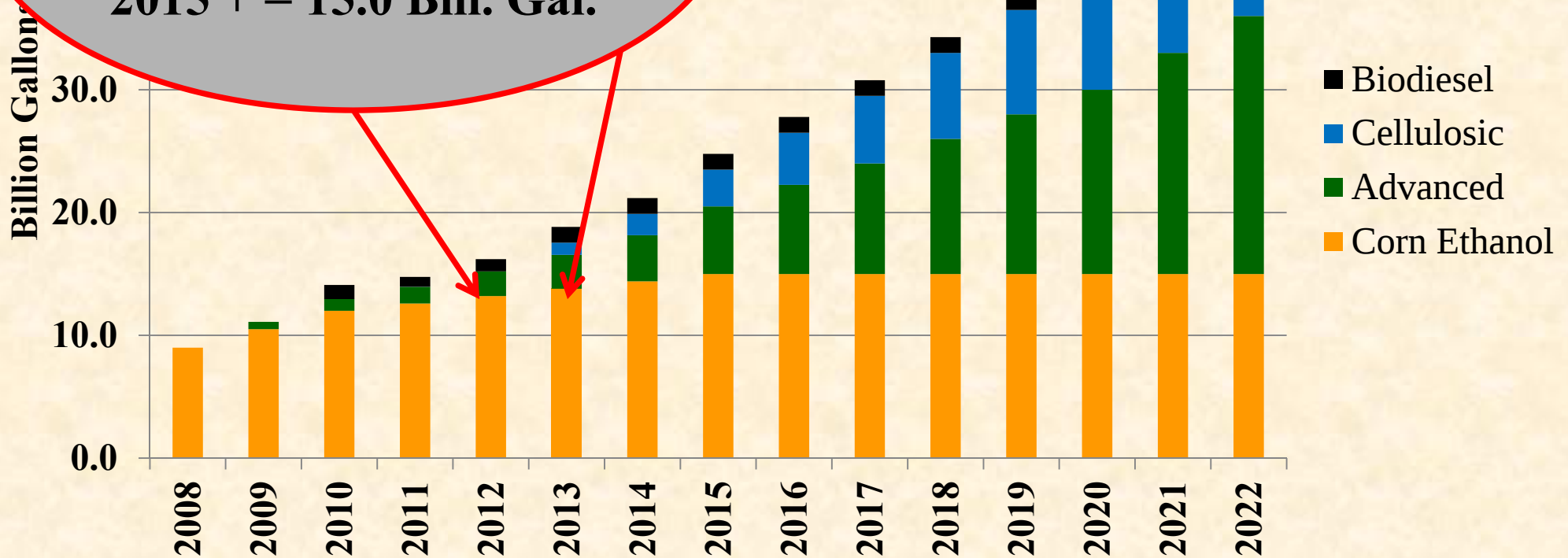
Renewable Fuels Standard (RFS2)



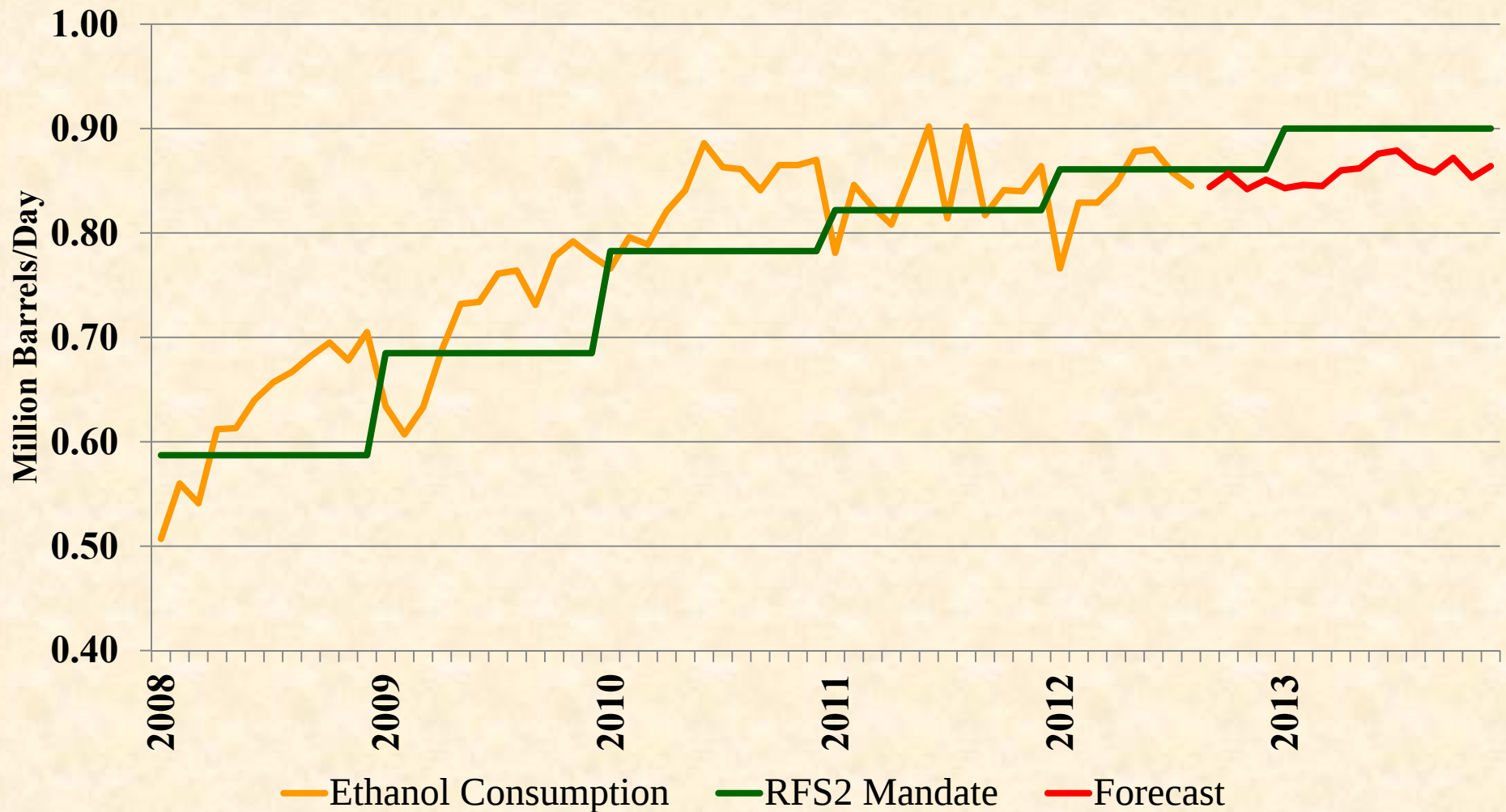
EISA 2007

Renewable Fuels Standard (RFS2)

2012 = 13.2 Bill. Gal.
2013 = 13.8 Bill. Gal.
2014 = 14.4 Bill. Gal.
2015 + = 15.0 Bill. Gal.



U.S. Ethanol Consumption



Economics of Ethanol Blending

- Oil refineries currently produce 84 octane gasoline, but add 10% ethanol to bring blend to the required 87 octane.
 - Ethanol is 115 octane
- Ethanol is now being used as a “volumetric replacement” for gasoline, not just a fuel additive.
- Price spread between gasoline and ethanol encourages blending.

RBOB vs. Ethanol Prices



RBOB = Reformulated Blendstock for Oxygenate Blending

DTN ProphetX 09-25-12

**Are there profits in making
ethanol?**

Corn – Estimated Ethanol Income

Estimated Net Income per Gallon of Ethanol					
Ethanol Price	Corn Price				
	8.00	7.50	7.30	7.00	6.75
1.90	(0.61)	(0.49)	(0.45)	(0.37)	(0.31)
2.00	(0.51)	(0.39)	(0.35)	(0.27)	(0.21)
2.10	(0.41)	(0.29)	(0.25)	(0.17)	(0.11)
2.20	(0.31)	(0.19)	(0.15)	(0.07)	(0.01)
2.30	(0.21)	(0.09)	(0.05)	0.03	0.09
2.40	(0.11)	0.01	0.05	0.13	0.19
2.50	(0.01)	0.11	0.15	0.23	0.29

Other operating and fixed cost estimates from AgMRC

Corn – Estimated Ethanol Income

Estimated Net Income per Gallon of Ethanol					
Ethanol Price	Corn Price				
	8.00	7.50	7.30	7.00	6.75
1.90	(0.61)	(0.49)	(0.45)	(0.37)	(0.31)
2.00	(0.51)	(0.39)	(0.35)	(0.27)	(0.21)
2.10	(0.41)	(0.29)	(0.25)	(0.17)	(0.11)
2.20	(0.31)	(0.19)	(0.15)	(0.07)	(0.01)
2.30	(0.21)	(0.09)	(0.05)	0.03	0.09
2.40	(0.11)	0.01	0.05	0.13	0.19
2.50	(0.01)	0.11	0.15	0.23	0.29

Other operating and fixed cost estimates from AgMRC

Corn – Estimated Ethanol Income

	General Plant Location					
	Eastern Corn Belt (Illinois)	Iowa	Minnesota	Nebraska	South Dakota	North Dakota
Corn Price/Bushel	\$8.00	\$7.30	\$7.20	\$7.35	\$7.25	\$7.00
Ethanol Price/Gallon	\$2.35	\$2.20	\$2.35	\$2.20	\$2.30	
DDGs Price/Ton	\$280	\$268	\$270	\$276	\$262	
Other Variable Costs/Gallon	\$0.22	\$0.22	\$0.22	\$0.22	\$0.22	
Overhead Costs/Gallon	\$0.21	\$0.21	\$0.21	\$0.21	\$0.21	
Return to Investors/Gallon	\$ -0.21	\$ -0.05	\$ 0.05	\$ -0.14	\$ -0.04	

Other operating and fixed cost estimates from AgMRC

Corn – Estimated Ethanol Income

	General Plant Location					
	Eastern Corn Belt (Illinois)	Iowa	Minnesota	Nebraska	South Dakota	North Dakota
Corn Price/Bushel	\$8.00	\$7.30	\$7.20	\$7.35	\$7.25	\$7.00
Ethanol Price/Gallon	\$2.35	\$2.20	\$2.35	\$2.20	\$2.30	\$2.30*
DDGs Price/Ton	\$280	\$268	\$270	\$276	\$262	\$262*
Other Variable Costs/Gallon	\$0.22	\$0.22	\$0.22	\$0.22	\$0.22	\$0.22
Overhead Costs/Gallon	\$0.21	\$0.21	\$0.21	\$0.21	\$0.21	\$0.21
Return to Investors/Gallon	\$ -0.21	\$ -0.05	\$ 0.05	\$ -0.14	\$ -0.04	\$ 0.02*

Other operating and fixed cost estimates from AgMRC

October CBOT Ethanol Futures



Competing Economic Analysis

CARD – Iowa State University

Updated August 2012

	Average Results Across 500 Yield and Price Draws		
	Full Mandate	Flexible Mandate	No Mandate
Corn Price (\$/bu)	\$9.73	\$7.82	\$7.24
Ethanol Plant Price (\$/gal)	\$3.37	\$2.85	\$2.70
US Ethanol Production (Bill. Gal.)	13.3	12.0	11.5
Ethanol RIN Price (\$/gal)	\$1.35	\$0.26	\$0.00
Ethanol Exports (Bill. Gal.)	0.00	0.39	0.38
Ethanol Imports (Bill. Gal.)	1.63	0.82	0.00

CARD = Center for Agriculture and Rural Development

Purdue University

Assumes “Strong Drought”

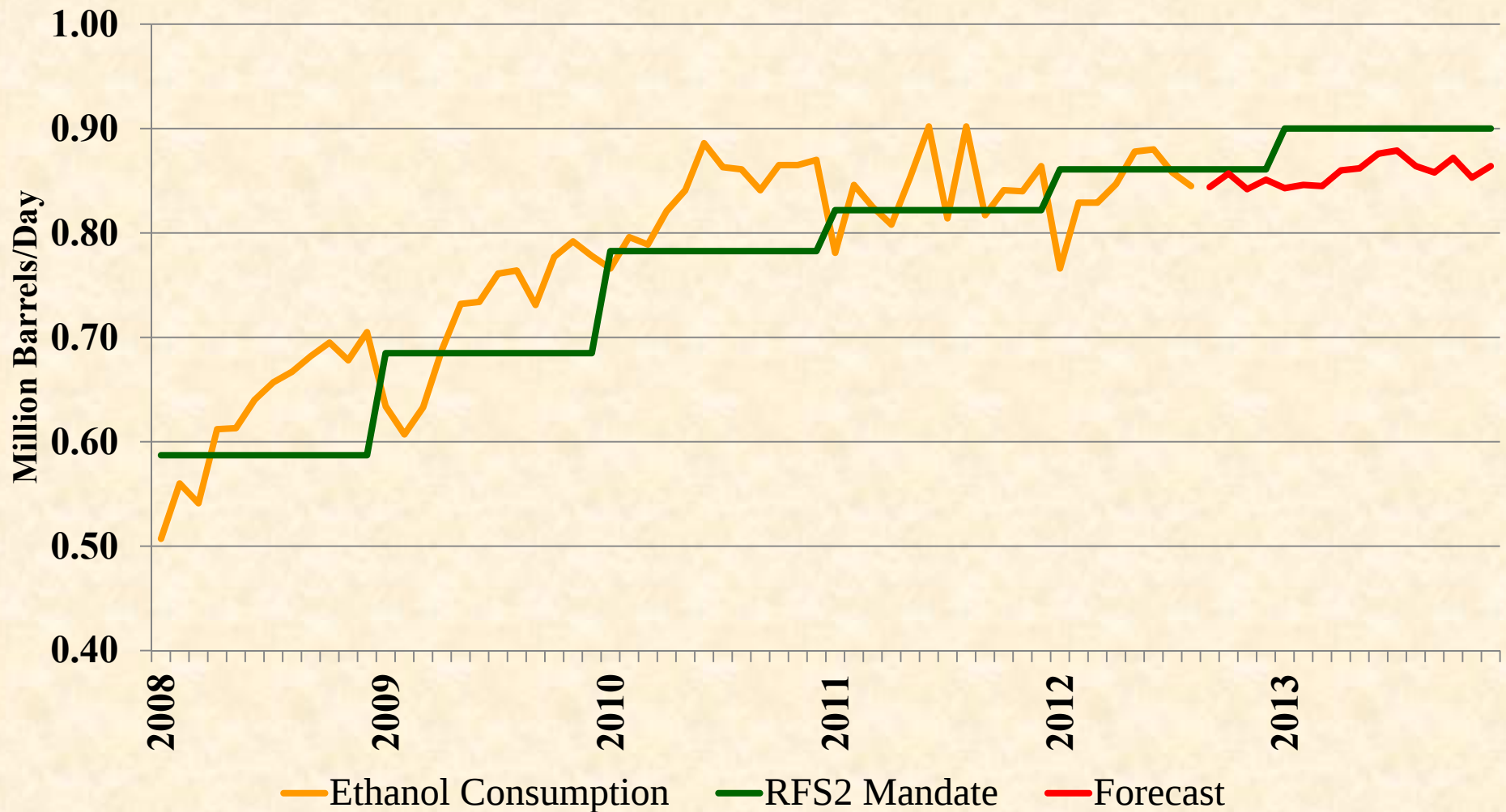
	Expectation Before Drought	13.8 Bill. Gal. Ethanol	11.8 Bill. Gal. Ethanol	10.4 Bill. Gal. Ethanol	7.75 Bill. Gal. Ethanol
Corn Production (Bill. Bu.)	14.65	10.50	10.45	10.42	10.35
Corn used for Ethanol	5.11	5.11	4.37	3.85	2.87
Feed and Food Use	6.72	3.96	4.59	5.03	5.58
Exports	1.82	1.43	1.49	1.53	1.63
Corn Price (\$/bu.)	\$5.26	\$8.57	\$7.89	\$7.45	\$6.58

Why is there a difference?

Key Considerations

- What will happen to gas prices?
 - Impact on ethanol prices → processing profits
 - Impact on gallons sold (blend wall!)
- What will happen to the cost of alternative octane boosters?
- How will ethanol blenders utilize RINs?
 - Renewable Identification Number
- What will happen to ethanol exports and imports?

U.S. Ethanol Consumption



QUESTIONS & COMMENTS?

Frayne Olson

Dept. of Agribusiness & Applied Econ.

NDSU Dept. 7110

P.O. Box 6050

Fargo, ND 58108-6050

701-231-7377

frayne.olson@ndsu.edu

<http://www.ndsu.edu/cropeconomics>