Ethanol Mandates Compliance Strategy and Course of Action for EPA

by Sebastien Pouliot

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IN NOVEMBER 2013, the Environmental Protection Agency (EPA) released a proposed rule for the 2014 biofuel mandates. The proposal was met with strong opposition from ethanol supporters but with much relief by the oil industry. This article explains how this rule came about and possible courses of action for EPA.

Congress first established the Renewable Fuel Standards (RFS) in the Energy Policy Act of 2005. The first RFS were relatively modest and the market quickly surpassed the mandated volumes. The RFS were revised two years later with the enactment of the Energy Independence and Security Act of 2007. The second iteration of biofuel mandates, RFS2, required an annual biofuel use of 36 billion gallons by 2022, with a cap on corn-starch ethanol of 15 billion gallons. Mandates for different categories of biofuel were set to increase annually.

EPA has approved three ethanol-gasoline fuels for general motorist use: E10, which contains 10 percent ethanol, E15, which contains 15 percent ethanol, and E85, which contains up to 83 percent ethanol. E10 is available in virtually all fuel stations while E15 and E85 are available in a small number of fuel stations. In late 2012 and early 2013, it became apparent that scheduled increases in ethanol consumption mandates would require increasing use of ethanol-gasoline blends that contain more

than 10 percent ethanol. With an expected E10 consumption for 2014 of about 130 billion gallons, 13 billion gallons of ethanol can be blended into gasoline, far short of the scheduled 14.4 billion gallons mandated for 2014. Many refer to the 13 billion gallon consumption of ethanol as the E10 "blend wall" because of the perceived difficulty in expanding consumption beyond this volume.

Obligated parties, such as oil refineries, must show compliance with the ethanol mandate by submitting Renewable Identification Numbers (RINs). EPA established a RIN market to reduce compliance costs. The price of RINs reflects the difference between the cost of producing ethanol and the value to ethanol buyers of one more gallon of ethanol. Therefore, the price of RINs reflects how difficult it is to meet the ethanol mandate. EPA rules allow banking of RINs so that accumulated RINs can be used for compliance. The ethanol mandate for 2013 of 13.8 billion gallons will be met by approximately 13 billion gallons of actual ethanol consumption and by using 800 million banked RINs. The stock of RINs is no longer sufficient to meet scheduled mandate increases with ethanol consumption limited to 13 billion gallons. Accordingly, RIN prices increased dramatically in January 2013, indicating that it would be very costly for obligated parties to meet the 2014 ethanol mandate.

U.S. ethanol policy made RINs an input in the production of gasoline. With a non-binding ethanol mandate, the price of RINs is zero, which does not increase costs to oil refineries. However, with an ethanol mandate in excess of the blend wall, the price of RINs is greater than zero, thus increasing oil refineries costs. Typically, when the price of an input increases, firms adjust and modify their practices to minimize the impact on profits of higher procurement costs. For the oil industry, knowing that they would eventually face an increase in the price of RINs, the most likely pathway to minimize costs of compliance was to develop an alternative distribution channel for ethanol volumes above the blend wall—currently, E85 appears to be the most likely channel for ethanol volumes beyond the blend wall. An increase in the supply of E85 would increase the demand for ethanol thus reducing the price of RINs. E85 is currently distributed in about 2,600 of the 115,000 fuel stations in the United States.

Since 1941, Iowa State University has conducted an annual land value survey intended to analyze, interpret, and disseminate information about farmland value trends throughout the state of Iowa. Individuals knowledgeable of market conditions, such as real estate brokers and economists, are asked to contribute price estimates for high, medium, and low value land in their counties, and, if applicable, surrounding counties. Survey administrators also analyze comparative sale values and other factors in developing an estimate of farmland values. While the survey does not provide an estimated value of any one piece of land, it does provide an overview of price trends for farmland on a state and county level.

In 1986, ISU professor and extension economist Mike Duffy took over as the head administrator of the Iowa Farmland Values Survey. However, when Dr. Duffy announced his retirement from ISU extension, the staff and faculty at CARD were granted the opportunity to administer this highly anticipated annual survey.

Historical Data

While one number—the average Iowa farmland acre value (estimated at $8,716 per acre in 2013)—typically garners the most attention, the survey actually provides a much more complex view of farmland values. The survey estimates an average overall value for farmland in each of Iowa's 99 counties, and a low, medium, high, and average value for land in each crop-reporting district, and the state as a whole.

The entire set of historical data including the years 1950–2013 is available on the ISU extension web site at *http://bit.ly/1csmLz8*. The following figure shows the weighted average value per acre of Iowa farmland from 1950 ($218) to 2013 ($8,716).

Iowa Farmland Value Survey Shows Historic High Statewide Average

THE IOWA State University land value survey reported an average increase of 5.1 percent in Iowa farmland values—the ninth time in the past 10 years land values have increased. The statewide average value of an acre of farmland is now estimated to be $8,716. Scott County in eastern Iowa saw the largest estimated increase over last year's value at 12.45 percent, the highest increase in value at $1,374, and now has the highest estimated total value per acre at $12,413.

Despite the average value increasing again, 2013 marked the second time in the past 10 years where some counties reported lower land values than the previous year. In 2009, 85 of Iowa's 99 counties reported lower values than the year before, and this year 14 counties reported lower land values than in 2012. This year, Osceola, Dickinson, Lyon, and O'Brien counties showed the largest average loss of value at 3.72 percent. Except for 2009 and 2013, all county land values have increased each year since 2004.

Interestingly, the 2013 survey reveals a shift that occurred in certain regions of the state. From 2010–2012 O'Brien County reported the highest land values in the state. However, in 2013, Scott County reported the highest increase in land values and the highest land values overall, while land values in O'Brien County actually dropped the most of all counties reporting lower values. It is interesting to note that from 1950–1973 and 1978–2009 Scott County had the highest land values in the state.

The slowing, or even reversal, of the rate of increase in land values is supported by data from other surveys. The Realtors Land Institute reported land values up 9.4 percent from September 2012 to March 2013 but only up 1.2 percent from March 2013 to September 2013. The Federal Reserve Bank of Chicago reported Iowa land values up 9 percent from October 2012 to October 2013, however, the same survey reported Iowa land values decreased by 1 percent from July to October 2013.

Outlook for land values

Strong and weak price sales occurring at the same time indicate a market in flux. The key question is if this shows the market is going to settle into a plateau, if it is just pausing before another takeoff in values, or if the market has peaked and is due for a correction. The odds are against a major collapse in land values; however, if projections of a new lower level for commodity prices hold then we should expect land values to drop accordingly.

There have been three 'golden' eras for Iowa land values over the past 100 years. The first ended in a long, drawn out decline in land values from 1921 to 1933, and the second golden era ended with a sudden collapse from 1981 to 1986. How this third golden era will end is not known, but it would appear that it will be a more orderly adjustment rather than a sudden collapse.

Currently, with respect to Iowa land values, one respondent described the situation as being a plateau. He based this comment on the observation that there had been some very strong sales in his area but there had also been some weak or no sales at recent auctions—a sentiment echoed by many of the respondents.

Market-influencing factors

Most survey respondents, 88 percent, listed positive and/or negative factors influencing the land market. Of these respondents, almost 83 percent listed at least one positive factor and 77 percent listed at least one negative factor.

The single biggest factor to assess land value movement is gross farm income, and a majority of survey respondents were concerned about income. Over three-fourths, 76 percent, of respondents cited lower commodity prices as a negative factor affecting land markets. Data show the rate of increase in land values slowed and commodity prices started dropping after June 2013.

In Iowa, corn and soybean price movements are good indicators of gross farm income movement. There was a 33 percent drop in the Iowa average corn price from October 2012 to October 2013, and there was an 11 percent drop in soybean prices over the same period. The November estimated price for Iowa corn was 39 percent lower than the November 2012 price, and soybean prices were 11 percent lower.

Commodity prices dropped this year, something that also occurred in 2009. Will commodity prices rebound as they did in 2010 or will they continue down? The answer to that question could provide insight into whether future land prices will rise or fall. ∎

Average Value per Acre of Iowa Farmland by Grades of Land
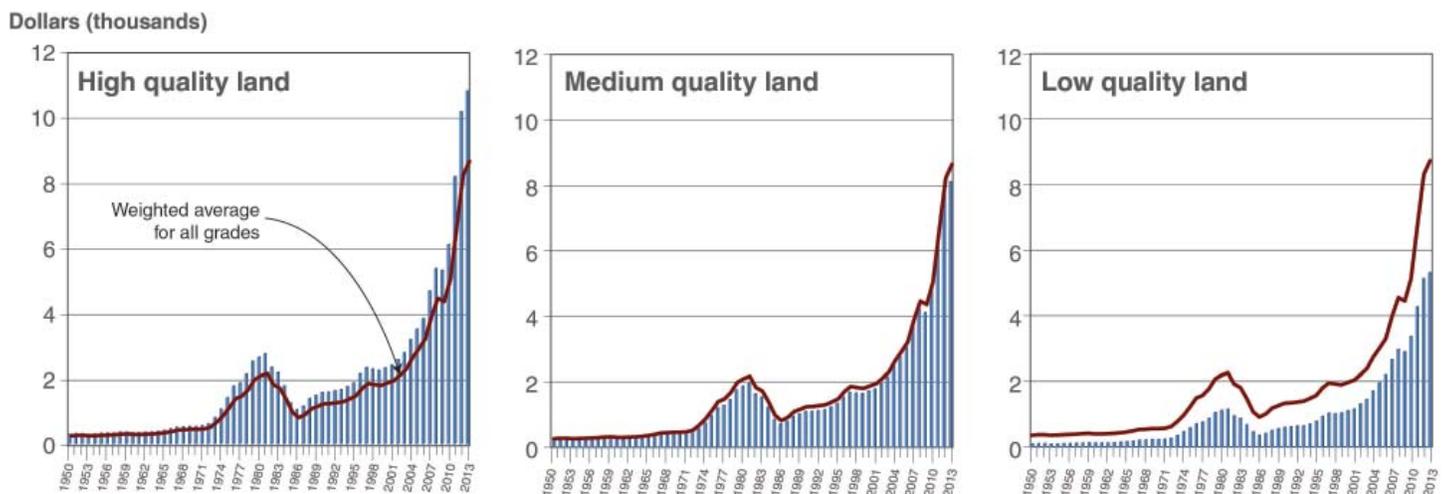
Retail Meat and Crop Demand Continue to Grow

by Chad Hart and Lee Schulz

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WITH THE general economy posting some positive numbers now, consumer demand continues to rebuild out of the depths of the past recession. The general demand trend across agriculture is positive, moving right along with other consumer demands. If there is a weak spot in agricultural demand right now, it is at the wholesale level for livestock. Record high prices and limited supplies have pinched packer demand for meat animals, as packers are concerned about the ability to continue to pass along higher prices to consumers. For crops, given the ample supplies that emerged last fall, the strength in crop demand has helped moderate prices over the past several months—basically holding crop prices around break even levels.

For livestock and meat demand, we will concentrate on the last quarter of 2013. Over the past decade-and-a-half, 4th quarter cattle demand from meat packers has been a see-saw affair. The big drop in demand occurred with the 2008–2009 recession. There was a strong rebound in packer demand in 2010 and 2011, but that demand has backed off again in the past two years. Packer demand for cattle in the 4th quarter of 2013 was slightly below the previous year's levels. With fed cattle prices at or near record levels, there is a lot of concern in the beef industry about pushing beef prices too high at the retail counter. That concern shows up as lower packer demand for cattle.

For hogs, the general trend has been for more demand from the packers. However, as with cattle, 4th quarter demand for hogs from the packing industry has been lower over the past couple of years, with 2011 being the high water mark for packer demand in the hog industry. Since then, the same concerns over retail meat prices have limited packer movements, so 2014 will be an interesting and challenging year in the meat packing industry with both cattle and hog prices in record territory.

While packers are concerned about the willingness of consumers to accept higher meat prices at the retail counter, the data from last quarter show that consumers have, for the most part, been willing to pay those higher prices. Retail beef demand in the 4th quarter has risen the last four years in a row, approaching the levels of demand from 2004. In fact, the last four years in beef demand is highly similar to a surge that occurred between 2000 and 2004; and with beef production expected to decline by roughly five percent this year, consumer willingness to accept higher beef prices will be challenged again.

Compared to the swings in retail beef demand since 2000, retail pork demand in the 4th quarter has been relatively steady. Pork demand also took a hit during the recession, but has since rebounded and is now above pre-recession levels. Last year's
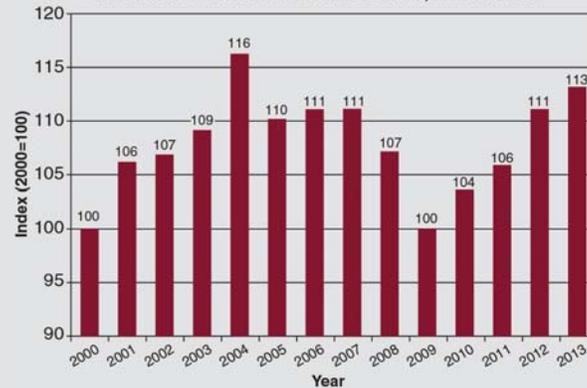

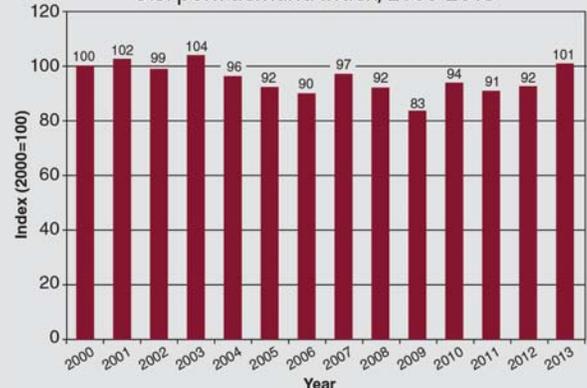U.S. packer demand for cattle index, 2000-2013
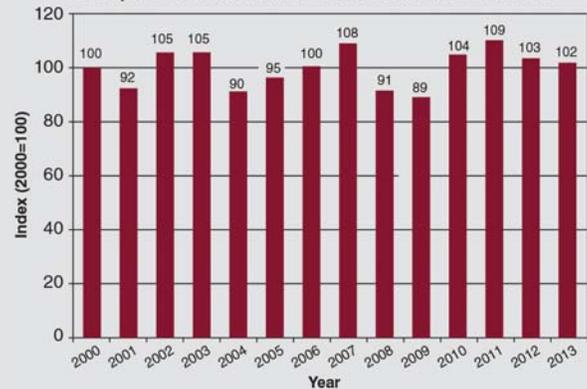
U.S. packer demand for hogs index, 2000-2013
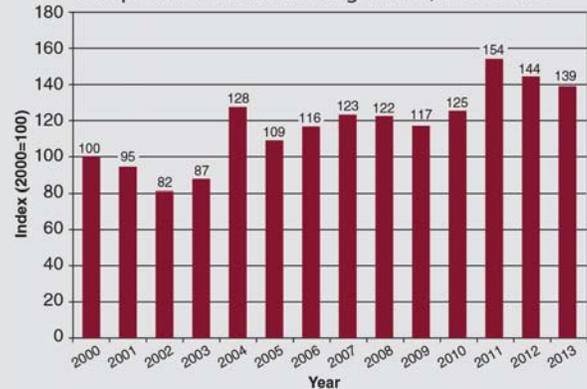
U.S. all fresh beef demand index, 2000-2013


U.S. pork demand index, 2000-2013

bounce in pork demand was the largest since 2010. While retail pork prices have risen, the rise in retail beef prices has helped the pork industry. That competitive advantage at the meat case has led to more pork demand. Looking forward, while pork prices are at record highs, pork production is expected to increase by one percent this year. That should alleviate some of the price pressure for pork at the meat case.

The demand picture for livestock and meat remains mixed. Packers are concerned about consumer acceptance of higher meat prices, but so far, consumers have been willing to buy meat at those higher prices. In general, meat supplies are projected to remain steady as lower beef production is offset by higher pork and poultry production. Record high livestock prices have created profit incentives in the livestock industry, and producers are beginning to ramp up production and chase after those profits. Given its longer production cycle, the beef industry will be the last to begin expansion.

For the crop sector, the marketing year does not line up with the calendar year. The months September to November represent the 1st quarter of the marketing year. Probably the best way to think about a crop-marketing year is to pretend the crop harvest is like New Year's, a new crop means a new marketing year. The crop markets entered the 2013/14 marketing year with supplies at or near record levels. The 2013 U.S. corn crop was the largest ever, while the 2013 U.S. soybean crop was within 100 million bushels of the record. Therefore, the big question was how quickly crop demands would respond to larger supplies and lower prices. The answer thus far has been "fairly quickly." For corn, demand has a very strong seasonal pattern due to livestock feeding. Given the limited grazing opportunities in the fall and winter months, corn utilization for livestock feed is the highest in the 1st and 2nd quarters of the marketing year. For the 1st quarter this marketing year, corn feed demand pulled an additional 400 million bushels over last year's levels. With ethanol and export demand also on the upswing, corn usage so far is running 15.5 percent ahead of last year's pace. Therefore, corn demand is strengthening as we enter 2014. USDA's projections show that strengthening will continue as we move through the year.

Soybean demand follows a similar pattern to corn, again based on livestock feed requirements. However, soybean export demand also is seasonal, and that amplifies the impact for soybeans. The reasoning behind the seasonal pattern to soybean exports is the seasonal pattern of worldwide soybean

U.S. corn demand index, 2000-2013

U.S. soybean demand index, 2000-2013
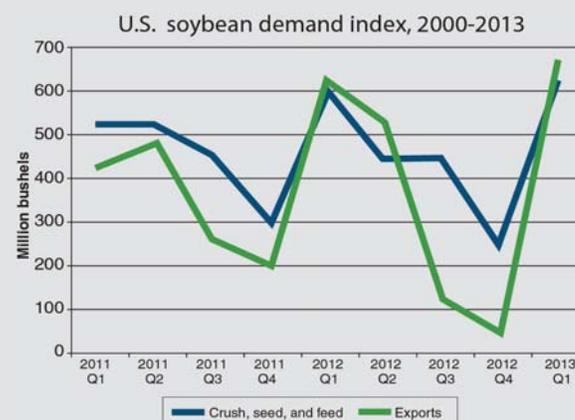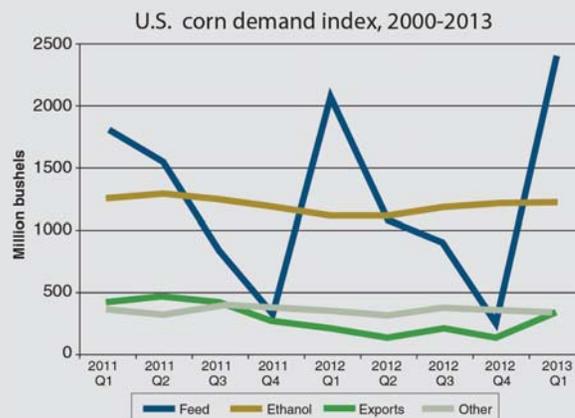
production. The vast majority of global corn supplies are produced in the northern hemisphere, meaning that there is only one huge shot of supply each year. Global soybean supplies come in two waves, one from the northern hemisphere (United States) and one from the southern hemisphere (Brazil and Argentina). Due to the second round of supply each year, export demands tend to shift between the hemispheres after each harvest. The United States dominates exports from our harvest to the South American harvest and Brazil and Argentina dominate exports from their harvest to ours. So far this marketing year, the United States has seen both domestic and international demand for soybeans increase. Crop demands are back on the rise. The problem for the crop markets are that these demand increases are just enough to hold prices steady, not enough to bring prices back to higher levels. ∎

Is there an Optimal Month to Forward Contract?

by Dermot Hayes

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KNOWING WHEN to forward contract is one of the most difficult aspects of grain marketing. If futures and forward markets worked perfectly, then this decision would not matter over the long run. Futures and forward contracts for harvest delivery should all be efficient predictors of the price at harvest and there should be no obvious trend in profitability of hedging across various months prior to harvest; however, as will be shown below, actual data for the last 20 years shows a modest but economically important pattern. Here I describe the trend and provide a suggestion as to why it exists.

Figures 1 and 2 below simulate the actual performance of hypothetical forward contracts for each of 24 months prior to harvest. The data show the average price that would have been received by producers who contracted to deliver harvested grain in each of the 24 months prior to that year's harvest. The larger the value, the better off was the producer who routinely contracted to deliver that many months prior to each year's harvest.

The figures are based on data from 1993–2013 and assume a constant basis between the delivery location and the CME.

The data for corn in Figure 1 shows a distinct downward trend indicating that those who forward contracted 24 months prior to harvest obtained a price $0.30 per bushel (about 10 percent) greater than those who sold in November of the harvest year. The data for soybeans also shows a $0.30 per bushel difference between the 24 month out forward contract and cash sales in October of the harvest year. Soybean data, however, indicates that the very worst time to sign a forward contract is 12 months prior to harvest.

These patterns could well be driven by random noise. It is possible that if this experiment was repeated for the next 100 years, these trends would disappear. However, it is also possible that there is something else going on.

There is a well-known phenomenon in grain futures markets called the "weather premium." These markets typically over predict the actual harvest futures price in more years than they under predict. The logic is that the magnitude of upside price movements in the event of bad weather is greater than the downside price movement in years when weather is good. Futures market builds in a premium to account for this asymmetry up to the point in the growing season where the weather is no longer a major determinant of yield. New crop futures typically fall in July as the weather premium dissipates.

What should happen is a price increase in bad weather, such as in 1995 and 2010, large enough to compensate for several more modest price reductions in good weather years. This does not appear to have happened. It is possible that futures market participants expected more bad years than were actually observed or that the upside price increases in bad years was not as large as they expected. Of course, it is also true that the 20 years of data used here is simply not long enough to contain a complete distribution of weather patterns.

The two-year trend in corn data may simply reflect the gradual dissipation of two years of weather premium. The twelve-month pattern in the soybean data may reflect the importance of the South American soybean crop and the dissipation of the weather premium due to uncertainty about this crop. ■
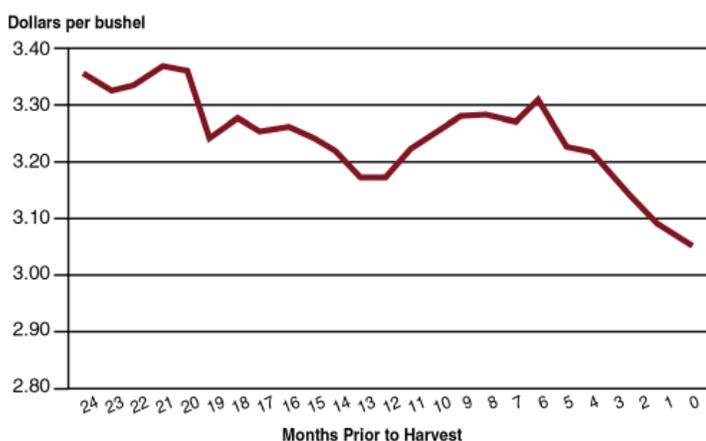

Figure 1. Average Corn Price Received on Forward Contracts Signed in Each of 24 Months Prior to Harvest
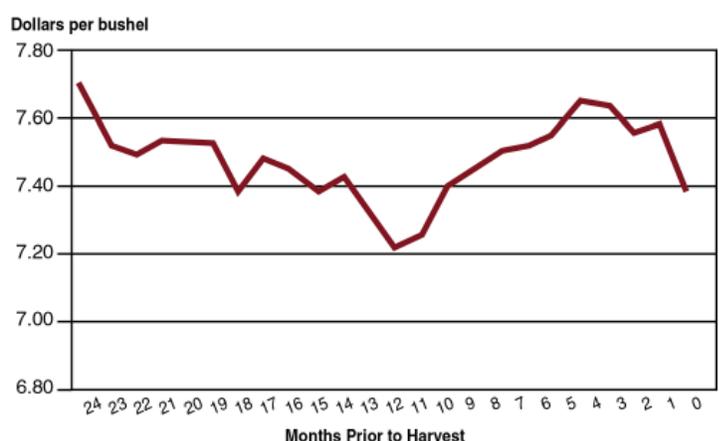

Figure 2. Average Soybean Price Received on Forward Contracts Signed in Each of 24 Months Prior to Harvest

The Protectionism of Food Safety Standards in International Agricultural Trade

by John Beghin

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PROTECTIONISM IN agricultural trade takes many forms from taxes and red tape at the border, to so-called non-tariff measures such as agricultural and food safety standards that exceed those recommended by international public health bodies. The World Trade Organization (WTO) does not set standards but strongly encourages member countries to use internationally accepted science-based standards whenever available. The WTO's Sanitary and Phytosanitary (SPS)

Agreement promotes harmonization of sanitary and phytosanitary measures and alignment on international standards, in short, they encourage countries to use the same standards as one another in setting their country's trade regulation to keep trade opportunities fair. The SPS agreement designates Codex Alimentarius, a joint body of the World Health Organization and the United Nations Food and Agriculture Organization, as the organization defining standards for food

safety. The WTO allows its members to vary from the Codex standards for a product, as long as the standards in its place are science based (evidence of a risk from the regulated substance), non-discriminatory (similar products of all origins treated similarly), and least-trade restrictive (no unnecessary trade impediments). Thus, a country that does not use the Codex standard to regulate its trade does not necessarily indicate protectionist motives, but the Codex standard provides an important baseline for assessing protectionist outcomes.

This article reports on recent research completed on the potential protectionist effects of maximum residue limits (MRLs) for pesticides (and a few veterinary drugs) established by individual countries in global agricultural and food trade. Countries set the MRL for specific pesticides or drugs and for specific agricultural and food items. Countries also define a set of default values which are used for pesticides or drugs that are not explicitly regulated as regulation trails behind new pesticide and drugs.

To provide insight into the potential for protectionist effects of the MRL standards set by countries, we designed and computed aggregated indices of protectionism for these MRLs based on the percent deviation of a country's MRL from the Codex standard. The indices allow for aggregation over MRLs and commodities and comparison across agricultural products and countries. One important property of these measures is that the indices increase more than proportionally with

Protectionism Indices:

A comparison of international residue standards to individual country standards. An indici of 1 suggests a lack of protectionism. The higher the indici the more protectionist the country's standards.
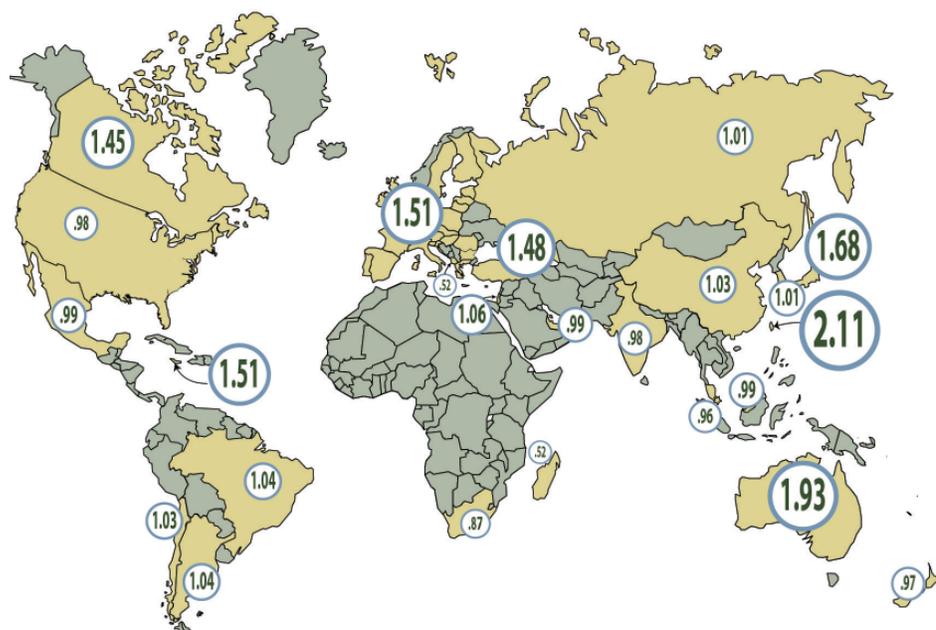
Country	Indici	Country	Indici	Country	Indici
Taiwan	2.11	Brazil	1.04	Mexico	0.99
Australia	1.93	Argentina	1.04	United States	0.98
Japan	1.68	Chile	1.03	India	0.98
Jamaica	1.51	Russian Federation	1.03	New Zealand	0.97
European Union	1.51	Rep. of Korea	1.01	Singapore	0.96
Turkey	1.48	China	1.01	South Africa	0.87
Canada	1.45	Malaysia	0.99	Sri Lanka	0.52
Israel	1.06	Unit. Arab Emirates	0.99	Albania	0.52

The strategy outlined above was not the one that the oil industry chose. Instead, the oil industry made the argument that ethanol mandates would impose a substantial burden and pushed EPA to lower ethanol mandates to keep the price of RINs low. With limited distribution of E85, any economic analysis of the ethanol market would show an increase in RIN prices for an increase in ethanol mandate above 13 billion gallons. Many pundits and the lobby of the oil industry predicted dire consequence to the U.S. economy unless ethanol mandates were scaled back below the blend wall. The lack of adaptation to ethanol mandates causes high RIN prices and thus solidifies the argument that ethanol imposes a large financial burden to the oil industry. However, the size of the increase in RIN prices has been conditioned by limited increase in the supply of E85.

The EPA lowered its 2014 mandate to 13 billion gallons based on consideration of the oil industry's claims. EPA noted in justifying its rule that it cannot increase ethanol mandates as long the capacity to distribute ethanol through E85 is not expanded.

However, the issue here is analogous to the chicken and the egg. Obligated parties can contribute to lower the price of RINs by increasing their capacity to distribute ethanol. Thus the price of RINs provide the appropriate incentives for increasing capacity to distribute ethanol. However, if RIN prices are low, there is no incentive to invest.

The best course of action for EPA is to make is a strong long-term commitment either to increase or freeze the ethanol mandate. If it is the goal of the EPA to expand ethanol volumes in the future, removing uncertainty is key to spurring investment in the distribution of ethanol, and thus in reducing compliance costs to obligated parties. A similar argument holds if EPA decides to freeze ethanol mandates. A pause in 2014 and then resetting course in 2015 would only cause firms to waste money, create uncertainty, and undermine the credibility of EPA.

It is a natural position for the oil industry to oppose biofuel mandates that increase their costs; and the proposed rule for 2014 shows that the oil industry has played its hand well in an effort to stop expansion of ethanol mandates. EPA has now received comments on the proposed rule and is set to release a final rule by this summer, which should set the course of U.S. ethanol policy for years to come. ∎
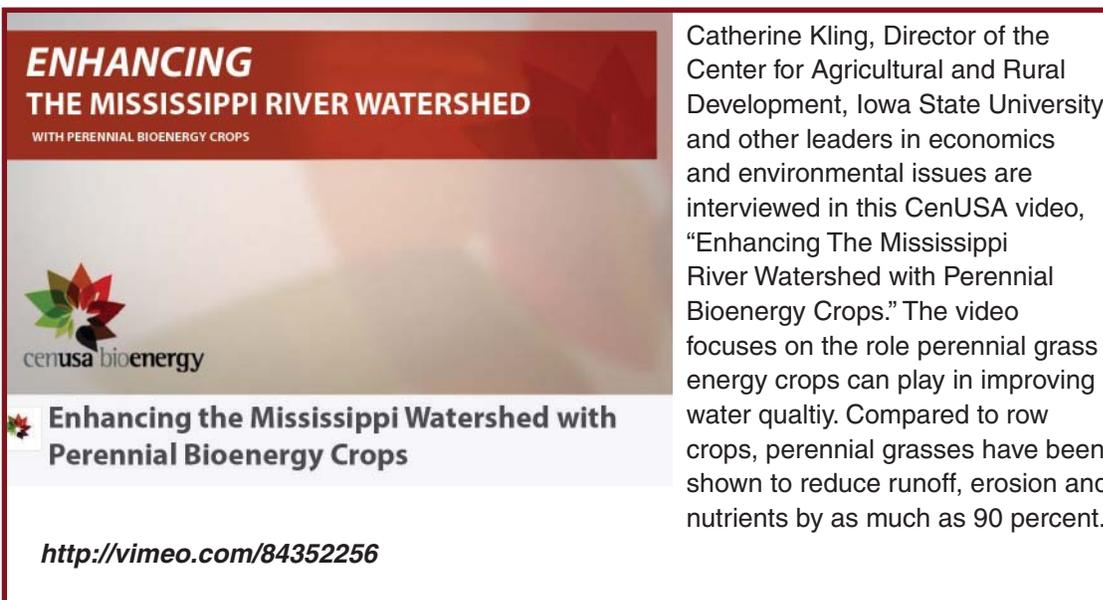
ENHANCING THE MISSISSIPPI RIVER WATERSHED
WITH PERENNIAL BIOENERGY CROPS

cenusa bioenergy

Enhancing the Mississippi Watershed with Perennial Bioenergy Crops

http://vimeo.com/84352256

Catherine Kling, Director of the Center for Agricultural and Rural Development, Iowa State University, and other leaders in economics and environmental issues are interviewed in this CenUSA video, "Enhancing The Mississippi River Watershed with Perennial Bioenergy Crops." The video focuses on the role perennial grass energy crops can play in improving water qualtiy. Compared to row crops, perennial grasses have been shown to reduce runoff, erosion and nutrients by as much as 90 percent.

increasing protectionism in MRLs to reflect the increasing difficulty to meet more stringent standards.

For pairs of chemicals and agricultural products for which a Codex standard exists and a country's MRL for that particular pair is set to be more stringent than the corresponding international standard, the index indicates protectionism (a value above 1). Vice versa, lax standards are anti-protectionist and the index value then falls below 1. The research did not consider MRLs for which Codex does not set an international standard, as the science is being established or risk may not exist.

The data used come from USDA Foreign Agricultural Service. The database used values for 2012 and had 19,486 pairs of pesticides and products for 83 countries with a total of over 1.6 million records. The pesticide MRL data swamps the veterinary drug MRLs in coverage with only about 9,000 veterinary drug records. In the analysis, the database is trimmed to about 400,000 usable observations for 77 countries by removing redundant data and observations without corresponding Codex standards. Here, we focus on pesticides as they drive results when using both pesticide and veterinary drug MRLs. We also limit the discussion to country level protectionism indices and refer the interested readers to our detail report for commodity level results.

Among the countries included in the data, 29 countries completely comply with Codex standards; 18 countries comply with EU standards; 7 countries defer to exporting countries standards; 5 countries comply with Gulf Cooperation Council (GCC) standards; and Mexico adopted U.S. standards. Finally, 22 countries set their own standards only or have standards partially combined with Codex or EU standards.

The table summarizes results on each country's protectionist indices. Australia, Japan, and Taiwan come out as the most protectionist countries. This is largely due to the fact that they have stringent default values for MRLs that they do not explicitly set (zero or near-zero tolerance when an MRL is not explicitly specified) and because they have many non-established MRLs. In addition, Australia and Taiwan have stringent established MRLs. In contrast, Japan actually is slightly anti-protectionist (the index is below 1) when computing the index solely using established MRLs. Russia and Brazil come out as systematically protectionist because of stringency on established MRLs but much less because of default MRLs which are lax. They have a large number of non-established MRLs, which dilute the presence of the limited number of established MRLs and their associated protectionism.

The EU, Turkey, and Canada are also among protectionist countries

because they have both tight default and established MRLs that are stricter than Codex. Interestingly, a few countries, including South Africa, Sri Lanka, and Albania have MRLs set much below Codex MRLs with the consequence of potentially under-protecting the health of their consumers from harmful residues.

None of these two measures provides a better measure of protectionism than the other. Rather they both shed light on two ways to be protectionist, one by actively over-regulating specific pesticides, and the other with a blanket policy that could be relaxed once a specific MRL is issued for a formerly unregulated pesticide.

The standard deviations of the indices tend to be small (this data can be found in the full paper cited below.) The research did not unveil evidence of countries being non-protectionist "on average" by offsetting a few very protectionist MRLs or markets with anti-protectionist ones. This finding is consistent with the observed small standard deviations across products within any country.

For further information and detail on the inquiry see Li, Yuan, and John C. Beghin "Protectionism Indices for Non-Tariff Measures: An Application to Maximum Residue Levels," Economics department working paper No. 12013, 2012. Forthcoming in *Food Policy*. ∎

Ask an Ag Economist

Farmland prices are setting records. Do economists know how much of this strong price appreciation is due to government policy such as ethanol mandates, subsidized crop insurance, direct payments, etc.?

THE WAY ECONOMISTS typically explain movements in farmland prices uses the "net present value method." This method sums up the "discounted expected future earnings" from farmland and arrives at an estimate of what farmland is worth today. Discounting is the method used to adjust for inflation, because $10,000 paid out in five years has less value than $10,000 paid out today. Thus, the two key factors that determine land prices are expected future earnings and the rate at which futures earnings are discounted.

The Great Recession that hit the U.S. economy in 2009 led the Federal Reserve to stimulate the economy by lowering interest rates. The lower interest rates dramatically reduced the amount of interest that can be earned. This decrease in interest earned narrows the gap between the value of $10,000 in five years and the value of $10,000 today. Thus, the action by the Federal Reserve dramatically lowered the discount rate that is used to value farmland.

To see the effects of a lower discount rate, the net present value of $250 earnings per acre into the future with a discount rate of 6 percent is $4,166.

The net present value of the same earnings with a 3 percent discount rate is $8,333. This demonstrates that the low interest rate environment we are in has dramatically increased farmland prices.

Direct payments and crop insurance subsidies have each averaged about $40 per acre. The net present value of $40 per acre each year into the future is $666 using a 6 percent discount rate and $1,333 using a 3 percent discount rate, showing these two subsidies account for some fraction of land values. However, because farm subsidies have always been available, they did not contribute to the increase in land prices that we have seen in the last 10 years.

The growth in ethanol production has certainly contributed to land price increases because increased demand for corn has led to increased corn prices. If we attribute an $80 per acre increase in expected futures earnings from land because of ethanol then increased ethanol production contributed $2,000 per acre to the increase in land prices since 2005 if we use a 4 percent discount rate.

The average price of farmland in Iowa increased by almost $6,000 between 2005 and 2013, according to the Iowa Land Value Survey. While it is not possible to state precisely how much of this increase was due to increased earnings and how much was due to lower interest rates, it is clear that both have contributed significantly. One might not be too far wrong in attributing 50 percent of the increase in land values to lower interest rates and 50 percent to higher expected earnings. ∎

Current CARD Research and Outreach Areas

- Energy and Biofuels Policy: renewable fuels standard, indirect land use, effects on food prices and trade, willingness to pay for bioplastics, perennial feedstocks
- Trade Policy: benefits of the Trans-Pacific Partnership, free trade agreements with South Korea, Columbia, and Panama, US-China trade in pork, EU-US free trade agreement (feedstock crops and bioenergy) trade barriers and quality standards, trade consequences of sustainability requirements, country of origin labeling,
- Agriculture and the Environment: Iowa Nutrient Reduction Strategy, agriculture and Gulf of Mexico hypoxia, grassland conversion and CRP losses, benefits of local water quality improvement,
- Food Security: USDA projections for countries at risk, food security in Ghana (with seed center),
- Nutrition: nutritional standards for national school lunch programs, global burden of foodborne diseases,
- Crop Insurance: Multi-year crop insurance, margin insurance for corn and soybeans,
- Crop yields: improved yield prediction, climate change and yields, predicting effects of GM crops on yields.

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