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HEARING TO REVIEW THE STATE OF THE FARM ECONOMY

HEARING

BEFORE THE

SUBCOMMITTEE ON
GENERAL FARM COMMODITIES
AND RISK MANAGEMENT

OF THE

COMMITTEE ON AGRICULTURE
HOUSE OF REPRESENTATIVES

ONE HUNDRED ELEVENTH CONGRESS

FIRST SESSION

APRIL 1, 2009

Serial No. 111–7

Printed for the use of the Committee on Agriculture
agriculture.house.gov

U.S. GOVERNMENT PRINTING OFFICE

52–504 PDF WASHINGTON : 2009

For sale by the Superintendent of Documents, U.S. Government Printing Office
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HEARING TO REVIEW THE STATE OF THE FARM ECONOMY

WEDNESDAY, APRIL 1, 2009

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON GENERAL FARM COMMODITIES AND
RISK MANAGEMENT,
COMMITTEE ON AGRICULTURE,
Washington, D.C.

The Subcommittee met, pursuant to call, at 11:05 a.m., in Room 1300 of the Longworth House Office Building, Hon. Leonard L. Boswell [Chairman of the Subcommittee] presiding.

Members present: Representatives Boswell, Marshall, Ellsworth, Schrader, Herseth Sandlin, Markey, Kissell, Pomeroy, Peterson (*ex officio*), Costa, Moran, King, and Luetkemeyer.

Staff present: Claiborn Crain, Adam Durand, Craig Jagger, John Konya, Scott Kuschmider, Clark Ogilvie, Anne Simmons, Rebekah Solem, Tamara Hinton, Josh Maxwell, Pelham Straughn, and Jamie Mitchell.

OPENING STATEMENT OF HON. LEONARD L. BOSWELL, A REPRESENTATIVE IN CONGRESS FROM IOWA

The CHAIRMAN. Okay. Well, thank you very much. We are glad to have you here, and the hearing for the Subcommittee on General Farm Commodities and Risk Management to review the state of the farm economy will come to order. And I will share a little opening statement, and then recognize my Ranking Member.

First, I would like to thank everyone for joining us today, as we take an examination and review, if you will, of the nation's farm economy. I would like to give a special thanks to our witnesses for testifying before the Committee, and offering their insight into current issues facing the agriculture economy.

I would also like to recognize, of course, a fellow Iowan who will be on the second panel, Dr. Neil Harl, a distinguished Professor from Iowa State University, as well as from Iowa. We very much look forward to hearing all the witnesses and testimony. We are all aware of the economic crisis our nation is facing, and the effects the crisis is having on businesses across the country.

However, oftentimes, the agriculture economy is overlooked. In recent years, agriculture has seen some of the most volatile times in our history. With the record high commodity prices and input costs of last year, farmers took on more and more risk. In recent months, commodity prices have been declining, yet farmers tell us that input costs have remained very high. Even with unpredictable market conditions, crop farming remains one of the more stable

and reliable aspects of agriculture, particularly when compared with animal agriculture, which seems to have fared relatively worse than crop farming.

The signals are pointing to a very volatile year ahead for all of agriculture. One industry in particular, which has been struggling, is the dairy industry. Dairy prices have been declining so much over the past several months that in some parts of the country, prices have dropped below $10 down from almost $20 just 1 year ago. But the dairy industry is not the only one feeling the pinch. Cattle ranchers have lost money for 21 straight months, I am told, and hog producers are losing over $20 per head. So, we will probably hear more details about these and other agriculture producers from our witnesses.

As we have progressed through the decades, agriculture farmers have become bigger and less diverse. I would like to highlight one bright point, that even at this unprecedented economic time, more and more smaller farmers are getting involved. In 1952, there were 230,000 farms in Iowa, but by 2002, that number dropped to around 90,000. So, it came as a surprise when the 2007 Census of Agriculture found the number of farms in Iowa had risen to 92,800. Some 4,000 new small farms have been created since 2002. While farmers are not unlike other industries facing a hard time getting credit, experiencing instability in the markets, and high input costs, it is these new smaller farms that are having, perhaps the toughest time coping with our economic climate.

Personally, having survived the farm crisis of the 1980s, I understand firsthand what our producers are going through each day. Even with all the issues facing the agriculture industry, it is very much better than others, such as the auto industry. Personally, I believe that American agriculture is one of the bright spots in our economy, but producers are not immune to the economic crisis that is going on.

Agriculture is a multi-billion dollar industry in the United States. Our industry not only helps feed us in this room, but also helps to feed the world. That is why it is so important that we make sure, as best we can, that agriculture economy continues to be strong.

[The prepared statement of Mr. Boswell follows:]

PREPARED STATEMENT OF HON. LEONARD L. BOSWELL, A REPRESENTATIVE IN CONGRESS FROM IOWA

I would like to thank everyone for joining me here today as we take a thorough examination of the nation's farm economy. I would like to give a special thanks to our witnesses for testifying before the Committee and to offer their insight into the current issues facing the agricultural economy. I would also like to recognize a fellow Iowan, Dr. Neil Harl from Iowa State University. I very much look forward to hearing all the witnesses' testimony.

We are all aware of the economic crisis our nation is facing and the effects that crisis is having on businesses across the country; however, oftentimes the agricultural economy is overlooked. In recent years agriculture has seen some of the most volatile times in our history. With the record high commodity prices and input costs of last year, farmers took on more and more risk.

In recent months, commodity prices have been declining, yet farmers tell us that inputs costs have remained high. Even with unpredictable market conditions, crop farming remains one of the more stable and reliable aspects of agriculture particularly when compared with animal agriculture, which has fared relatively worse than

crop farming. But signals are pointing to a very volatile year ahead for all agriculture.

One industry in particular, which has been struggling, is the dairy industry. Dairy prices have been declining so much over the past several months that in some parts of the country prices have dropped below $10, down from almost $20 just 1 year ago. But the dairy industry is not the only one feeling the pinch. Cattle ranchers have lost money for 21 straight months and hog producers are losing over $20 per head. We will hear more details about these and other agriculture producers from our witnesses.

As we have progressed through the decades in agriculture, farmers became bigger and less-diverse. I would like to highlight one bright point that even in this unprecedented economic time: more and more smaller farmers are getting involved. In 1952, there were 203,000 farms in Iowa but by 2002, the number had dropped to around 90,000. So it came as quite a surprise when the 2007 Census of Agriculture found that the number of farms in Iowa had risen to over 92,800. Some 4,000 new small farms have been created since 2002. While farmers are not unlike other industries facing a hard time getting credit, experiencing instability in the markets, and high input costs, it is these new smaller farms that are having the toughest time coping with our economic climate.

Having survived the farm crisis of the 1980's I understand first hand what our producers are going through each day. Even with all the issues facing the agriculture industry it is faring much better than others such as the auto industry. I believe that American agriculture is one of the bright spots in our economy, but producers are not immune to the economic crisis going on.

Agriculture is a multi-billion dollar industry in the United States. Our industry not only helps feed us in this room, but also helps to feed the world. That is why it is so important that we make sure the agricultural economy continues to be strong.

At this time I would like to turn it over to my good friend and colleague, Jerry Moran from Kansas for any opening remarks he would like to make.

The CHAIRMAN. At this time, I would like to turn it over to my good friend and colleague, Jerry Moran from Hays, Kansas, for any opening remarks he would like to make.

OPENING STATEMENT OF HON. JERRY MORAN, A REPRESENTATIVE IN CONGRESS FROM KANSAS

Mr. MORAN. Mr. Chairman, thank you very much. This is our first Subcommittee hearing under your leadership, and I want to be the first to, again, congratulate you on your ascension to Chairman of this Subcommittee, a role that I played in the past. My only consolation is that Mr. Peterson used to be my Ranking Member, and he has become the full Committee Chairman, so perhaps there is still hope for those of us who fill the role that I am now in. But, I very much look forward to working with you throughout this term of Congress, and appreciate the close working relationship that we have always had.

I, too, welcome the witnesses, and appreciate the opportunity to hear from them, and garner some expertise from their expertise. I am particularly interested in issues that, I hope, will be discussed in regard to budget implications in the farm bill that are currently being discussed in Congress, and its impact, or any changes in the farm bill and the budget as it relates to agriculture. What would that impact be upon production agriculture across the country. I am interested in knowing about access to credit, what circumstances our farmers find themselves in in this current environment. I have continued concerns about input costs and how to answer the question of many producers of why commodity prices have come down, grocery store prices have not come down as much, input prices have not come down as much, and that relationship between those prices. I am interested in the global economy, and

its effect upon demand for agricultural products that we produce in the United States and any indication about what we foresee, as far as weather and climate changes that would affect the economy of producers across Kansas and around the country.

So, this is, in my opinion, a good way for us to begin our Committee's work, by hearing from folks from across the country as to exactly what are the circumstances that our producers find themselves in, and hopefully, they will provide us with recommendations about how we can be helpful, to see that this important component of the economy of the United States is enhanced and has a bright future.

So, Mr. Chairman, thank you very much. I look forward to hearing the witnesses' testimony and the opportunity to question and hear their answers. Thank you.

The CHAIRMAN. Well, thank you, Jerry. Good to have you here, and I appreciate our long time friendship, and I always tell Jerry, when I traveled across, having to go through Hays, if they get one of those barriers up, why, I don't guess I know where I am going to head. I hope I can find a basement pad or something.

Mr. MORAN. We have a basement that you are always welcome in.

The CHAIRMAN. Okay, good.

At this time, we would like to recognize the Chairman of the full Committee, Congressman Peterson, for any remarks he might like to make.

OPENING STATEMENT OF HON. COLLIN C. PETERSON, A REPRESENTATIVE IN CONGRESS FROM MINNESOTA

Mr. PETERSON. Well, thank you, Mr. Chairman, and thank you and Mr. Moran for your leadership, calling this hearing, to take a look at the economic conditions in agriculture.

Most people, with all the stuff that is going on, have not focused on the farm sector. Everybody is out there focused on housing, Wall Street, big banks, the auto industry, the G20, and all the stuff that is going on. But the farm economy, as we know, is vital to the health of this country, and it shouldn't be overlooked. And I would argue that some of this financial crisis that we are involved in has had, well, it has obviously had an effect on agriculture because of what it has done for the demand for some of our products. In my opinion, a lot of this extra money that came into agriculture over the last period of time, has caused problems, significant problems as well. And we tried to address that with the bill that we passed last year, and the bill that we have passed this year out of the Committee to try to make sure that we don't have people getting around the speculation limits in the commodity markets and futures markets and so forth.

You know, people have argued that somewhere or another, all this extra money that came in from Wall Street didn't have an effect. I mean, when the money all came in, these prices went up, oil prices, commodity prices—all the corn, wheat, and so forth—and then, when the financial collapse happened, and these people had to take their money out, then the whole thing collapsed. And so, I mean, I am not an economist, but it just seemed pretty obvious

to me that there is something going on here. I am not sure we can document how much.

We have problems in ethanol now, and to some extent it was caused by this outside money that has come into agriculture, when there was a lot of money being made. There was a period of time there, if you built your plant at the right time, you could get your plant paid for in 1 year. And so, all this money came in from Wall Street thinking they were going to cut a fat hog, and when it went the other way it—same thing happened, they abandoned the situation. So, these folks are not necessarily in it for the long haul, and they are causing us problems by bringing in money that maybe we don't need.

We have problems in the dairy sector. I commend the Secretary for buying, now saying that they are going to buy 200 million pounds of dry milk. I wish they would go further and do the Maximum DEIP Program and some other things, but we will keep working with them. But by and large, agriculture is—we are not in the greatest shape, but compared to the rest of the country, we are doing pretty good. And the one thing that I am intent on is not screwing up.

And so, that is why I told the President that I didn't agree that we should be opening up the farm bill. You know, we just got through doing that. We paid for it, and we made some cuts. We got it done. The bill isn't even implemented, and so it is not time to go in and start making changes, and I think we are. I hope people are listening to us in that regard as well.

So, Mr. Chairman, I thank you for your leadership. I welcome the witnesses. I think it is important that we focus on this, and that we do what we can here, from the Agriculture Committee, to make sure that we have a profitable and healthy agriculture sector in this country.

Thank you.

[The prepared statement of Mr. Peterson follows:]

PREPARED STATEMENT OF HON. COLLIN C. PETERSON, A REPRESENTATIVE IN CONGRESS FROM MINNESOTA

Thank you, Chairman Boswell, for calling today's hearing. This is an important and timely hearing given the tough economic times we are all facing, perhaps the toughest in several generations.

Most people have not focused on the farm sector when talking about our economic condition. Instead, they have focused on housing, Wall Street, the big banks, and now this week, the auto industry. But the farm economy is vital to the economic health of many areas in this country and it should not be overlooked.

We have spent a lot of time and effort in highlighting what unprecedented price volatility has done to the agricultural economy. Less than a year ago, this Committee held a hearing to examine the dramatic movements in agricultural and energy commodity markets which had resulted in record- or near-record levels for vital commodities, due in large part to high demand and tight supplies. This volatility caused problems with producers and purchasers alike, hurting their ability to enter into forward contracts and offset price risk.

However, as 2008 ended, the bottom fell out of many market prices for grains, dairy, livestock, and energy did snap back from record highs, and they crashed in a short amount of time.

Oil, for example, went through the $100 barrier, up to $147, and then bottomed out at $32, all in 1 calendar year. This development, in particular, has caused a lot of hardships for those in the ethanol production sector, which is under financial strain and facing consolidation.

This time last year, there were concerns from many different quarters on whether or not there would be enough crop production to meet demand. Now, we are facing a supply glut in many markets, with rapidly declining prices. But input costs still remain high, creating a classic price squeeze in the crop and livestock sectors. The price roller coaster hit the dairy industry very hard, and I'm pleased that USDA will buy 200 million pounds of nonfat dry milk for domestic feeding programs in order to support low-income families while providing relief for America's dairy farmers.

We need to see how agricultural producers nationwide are faring in the current economic climate. Today's hearing will help this Committee get a picture of the overall agricultural landscape as we examine what current prices and trends may mean for the future. We will also look at farm sector financial health and broad macroeconomic factors that influence commodity markets. Debt-to-asset ratios, for instance, are much better in farm country than they are in other places, but that does not mean there isn't cause for concern. A deflationary economy can have adverse effects on farmland real estate value and the ability to repay debt.

I appreciate each of today's witnesses for being here to share your thoughts with this Committee on the economic factors that influence farm policy. I look forward to your testimony, and I yield back.

The CHAIRMAN. Thank you for those remarks.

I think I will ask the rest of the panel to not share opening remarks. Anything you want to put in the record will certainly be acceptable, and then, in the question period, you can offer it at that time.

[The prepared statement of Mr. Lucas follows:]

PREPARED STATEMENT OF HON. FRANK D. LUCAS, A REPRESENTATIVE IN CONGRESS FROM OKLAHOMA

Thank you Chairman Boswell and Ranking Member Moran for holding this hearing to review the state of the farm economy.

And, thank you to our two panels for your time today.

These are difficult and uncertain times for folks all across rural America. I hear of the specific challenges our farmers and ranchers face when I go back home to Oklahoma. But, it is important to take a long and broad look at the challenges our producers, as a whole, are facing all across the country.

We are facing a global economic crisis, which has weakened the farm economy. Commodity prices have dropped significantly over the past 6 months. Although input prices have fallen a bit as well, it is not enough to compensate for the loss in profits and cash flow for our producers. USDA recently reported that U.S. net farm income is down 20% from last year.

These are serious issues alone. But, adding to the problem is the fact that we have an Administration that is intent on eliminating the farm safety net to our producers. This Administration doesn't seem to understand the problems facing our agriculture communities, or how important these communities are to our economy. If this Administration did, it wouldn't try to eliminate direct payments to those producers who make $500,000 in annual sales. Sales. Not profit. This is not only a bad idea, but it's the wrong policy approach and it is a direct attack on full-time, family-run farmers.

Our farmers and ranchers are some of the hardest working people in the U.S. and they are struggling to make a living in a difficult economy. The people who provide us with the safest, most abundant, most affordable food and fiber supply in the history of the world are being asked to shoulder the burden of our economic crisis.

My concerns about this Administration only grow when, despite opposition from House and Senate lawmakers and many farm groups, Secretary of Agriculture Tom Vilsack and the Director of the Office of Management and Budget, Peter Orszag both say they believe there will be a way to reduce farm supports.

This Administration doesn't understand that farm supports, especially in the form of direct payments, allow farmers to show bankers and farm credit that they have the income to repay their loans. This Administration doesn't understand that direct payments provide producers with the flexibility to respond to market signals when choosing crops. And, most importantly, this Administration doesn't understand that direct payments are a commitment we made to our producers when we passed, with bipartisan support, the 2008 Farm Bill.

I would like to thank Chairman Peterson for continuing to support the 2008 Farm Bill that he and many of us worked hard to secure.

I look forward to the testimony from our panelists today, especially as it pertains to credit availability.

The CHAIRMAN. So to move us along, I would like to recognize our first panel, and thank them for being here. Dr. Glauber, Chief Economist, U.S. Department of Agriculture, thank you for being with us. Dr. Henderson, the Vice President and Branch Executive, Federal Reserve Bank of Kansas City, Omaha Branch, Omaha, Nebraska, appreciate your presence and spending your time. Dr. Gruenspecht, the Acting Administrator, Energy Information Administration, U.S. Department of Energy, Washington, D.C. Good to have you, and I hope I got through your name okay.

Thank you very much, and we would like to recognize Dr. Glauber at this time, please.

STATEMENT OF JOSEPH GLAUBER, PH.D., CHIEF ECONOMIST, U.S. DEPARTMENT OF AGRICULTURE, WASHINGTON, D.C.

Dr. GLAUBER. Well, thanks very much. Mr. Chairman, Members of the Committee, thank you for the opportunity to discuss the economic outlook for U.S. agriculture.

This time last year, the outlook picture was quite different than it is today. Prices for most commodities were near records, record highs and rising, and farm exports and farm income were projected to be at record levels. There were concerns about whether there would be enough crop production to meet global demand. Livestock, dairy, and poultry producers were seeing their operating margins squeezed, and food price inflation was being discussed with concern for the first time in about 20 years.

A lot has changed since then. We have seen prices for most commodities fall 40 to 50 percent from their mid-year peaks, and the global economic slump has cast a pall on most markets, and while net cash income is projected at high levels relative to historical averages, there remains much uncertainty.

Yesterday, the National Agricultural Statistics Service released their annual *Prospective Plantings* Report. The NASS estimates are based primarily on surveys of producers' planting intentions conducted during the first 2 weeks of March. They indicate that farmers will likely plant about 85 million acres of corn, compared to about 86 million acres last year, 76 million acres of soybeans, about the same level as last year, 58.6 million acres of wheat, down 4.5 million acres from last year, and only 8.8 million acres of cotton, which would be the lowest level since 1983, and for many states, the lowest level since the early 1940s, when we started collecting the data.

It is important to note that actual plantings will likely differ from intentions. Producers will adjust actual plantings as more information on price relationships, input costs, and weather becomes available. Our first official supply and demand estimates for the 2009–2010 marketing year will be published on May 12.

In my written statement, I discuss the implications of the planting intentions for the crop outlook for the 2009/10 marketing year. Most of the row crops will see a drop in prices from 2008/09 levels, though they will remain above the average for the previous 5 years. The livestock, dairy, and poultry sectors are being challenged by

weak domestic demand, domestic and global demand for meat and dairy products.

Uncertain demand, coupled with relatively high feed prices, caused producers to start cutting back or slow production by the last quarter of 2008. The pullback in output is expected to continue throughout most of 2009, with total meat production down about two percent from 2008, and milk production declining about 0.8 percent.

Cattle, hog, and turkey prices are expected to be lower, particularly in the first half of 2009. Broiler prices are an exception. They are up, but largely due to the fact that they had sharp production cuts last year.

Average milk prices for 2009 are forecast at $11.55 a hundredweight—that is the lowest level since 1978—although they are expected to rise over the second half of 2009, as more dairy cows are culled and production drops. USDA's Economic Research Service forecasts net cash income in 2009 at $77.3 billion. That is down $16.1 billion from 2008. Crop receipts are forecast at $162.4 billion in 2009, down $18.7 billion from 2008, but still the second highest on record. Livestock receipts for 2009 are forecast at $132.2 billion, down $10.9 billion from 2008.

Lower input costs, such as feed, fuel, and fertilizer, will lower cash expenses this year. ERS forecasts cash expenses at $247 billion, down $14 billion from 2008 levels.

Despite the projected decline in farm income, the farm financial picture going into 2009 remains favorable, with total farm debt equal to about 9.1 percent of total assets. That is compared to over 20 percent in the mid-1980s. The debt-to-asset ratio has declined steadily, from 15.2 percent in 1998 to the current projected 9.1 percent.

The decline was due to strong appreciation in land values, which increased by over $1 trillion from 1998 to 2008. ERS forecasts the value of farm assets to rise by 1.6 percent in 2009. That would be the smallest increase since 1991. While farm real estate values remain significantly higher than last year, the recent Federal Reserve Bank survey showing fourth quarter declines in land values in many bank districts given further credence to the view that land markets have softened.

Despite the weakened economic outlook for farmers, most of the districts report that availability of funds was higher in the fourth quarter of 2008 than in the third quarter of 2008. However, collateral requirements for non-real estate farm loans are becoming more restrictive.

The downturn in the general economy may also be having an adverse effect on off-farm income sources for many farm households. Two thirds of all farm households reported income from wages and salaries from off-farm employment, and almost ¼ of farm households reported income from a non-farm business. That data is from 2007. Dividend earnings were reported by 36 percent of farm operator households in 2007.

With confidence in financial markets weakened in the global economy in the worst recession since prior to World War II, the agricultural economy faces much uncertainty. As expected, most aggregate measures are forecast to be down sharply from record

highs reached last year. Concerns with deflationary pressures remain, particularly if lower farm receipts persist over the long run. This could adversely affect farm real estate values, and undermine what has been to date a relatively strong financial position.

That said, the outlook is for a return to higher prices, as many of the pressures that drove last year's price increases, like high energy prices, the Renewable Fuel Standard, and strong economic growth in emerging markets, will return to play a major role.

In addition, while other sectors of the economy may be credit-constrained, many farm lenders appear to be in good financial shape, and access to credit for farmers appears to be sufficient.

That completes my statement, Mr. Chairman, and I would be happy to answer any questions.

[The prepared statement of Dr. Glauber follows:]

PREPARED STATEMENT OF JOSEPH GLAUBER, PH.D., CHIEF ECONOMIST, U.S. DEPARTMENT OF AGRICULTURE, WASHINGTON, D.C.

Mr. Chairman, Members of the Subcommittee, thank you for the opportunity to discuss the economic outlook for U.S. agriculture. This time last year, the outlook picture was quite different than today: prices for most commodities were near record highs and rising; and farm exports and farm income were projected to be at record levels. There were concerns about whether there would be enough crop production to meet global demand. Livestock, dairy and poultry producers were seeing their operating margins squeezed, and food price inflation was being discussed with concern for the first time in almost 20 years.

Recent Developments in Commodity Markets

What a difference 12 months make. We have seen prices for most commodities fall 40–50 percent from their midyear peaks. The global economic slump has cast a pall on most markets and, while net cash income is projected at high levels relative to historical averages, there remains much uncertainty.

World Economy and U.S. Trade: The International Monetary Fund is currently projecting global economic output to decline between 0.5 and 1.5 percent in 2009. This would be the first time that global output has declined in the post-World War II era. Output of the advanced economies is projected to decline between 3 and 3.5 percent while emerging and developing countries are projected to grow by just 1.5 to 2.55 percent. According to the World Trade Organization (WTO), world trade in goods and services is expected to decline by 9.0 percent—the first decline in world trade since 1982, and the largest drop in the post-World War II period. Exports by emerging and developing countries are projected to fall between two and three percent in 2009, after annual increases of 17 and 20 percent in 2007 and 2008, respectively.

In Fiscal Year (FY) 2008, U.S. agricultural export sales surged by an unprecedented $33 billion, to a record $115.4 billion. Key drivers behind the growth were record grain and oilseed prices and volume gains for virtually all products. Strong global economic growth and a weak dollar were also key factors along with reduced competition in grain markets. With FY 2008 imports at $79.3 billion, the net agricultural trade balance for FY 2008 was a record $36.1 billion (*figure 1*).

Our export forecast for FY 2009 is $95.5 billion, $20 billion lower than 2008, but still more than $13 billion above FY 2007's level and the second highest on record. Mainly due to increased competition, U.S. wheat and corn exports are expected to account for 60% (down $12.2 billion) of the overall decrease due to falling prices and volumes. Soybeans and soy products account for another 20% (down $4.1 billion) of the $20 billion decrease, with lower unit values and volumes for oil and meal and lower prices for soybeans. While wheat and coarse grain export volumes are expected to fall about 5 and 6.5 million metric tons (mmt) respectively, soybeans are actually forecast to hold mostly steady at about 31 mmt. Foreign demand for U.S. soybeans remains strong with near record demand from China and reduced South American supplies. The outlook for cotton indicates sales will fall $1.2 billion and close to half a million tons as the global recession reduces demand for textiles.

Like bulk commodities, our export outlook for high-value meats and other animal products calls for the value of exports to fall $1.3 billion to $19 billion. Here, volume losses could be a more important factor. Beef and pork prices should hold relatively

steady, but pork volume is down as China's pork industry rebounds. Price and volume declines are expected for other products like broiler meat, animal fats, hides and skins, and dairy products. Animal fats follow vegetable oil markets, and hides and skins (like cotton) are heavily affected by recession and declining sales of manufactured products. The global dairy market is once again facing an oversupply situation with weakened global demand and rising milk production in Europe, New Zealand, and Australia.

Running counter to the general trend, horticultural exports are actually forecast to rise slightly to $21.5 billion. The recession's impact is felt as the growth in export value slows to its lowest rate in 7 years. Overall volume is likely to remain unchanged, but prices are sticky and may even rise in some fresh produce categories.

FY 2009 agricultural imports are a record $82.5 billion. This reflects the slowest growth rate in many years due to the slowing economy and falling consumer spending. The net trade balance is expected to fall to $13.0 billion, down $23 billion from FY 2009, but remains the second highest trade balance since FY 2001.

Crop Prospects: Yesterday, the National Agricultural Statistic Service released their annual *Prospective Plantings* report. The acreage estimates in this report are based primarily on surveys of producers' planting intentions conducted during the first 2 weeks of March. The supply and demand estimates that follow are based on the *Prospective Plantings* report. It is important to note that actual plantings will likely differ from intentions. Producers will adjust their actual plantings as more information on price relationships, input costs, and weather becomes available. The official USDA supply and demand estimates for the 2009/2010 marketing year will be published on May 12, 2009, in the *World Agricultural Supply and Demand Estimates* report.

Cropland area is expected to contract in 2009 as plantings for the major field crops decline with lower prices and generally less favorable net returns (*table 1*). Combined planted area for the eight major field crops (corn, sorghum, barley, oats, wheat, rice, cotton, and soybeans) is expected at 245.9 million acres, down 7.1 million acres from 2008.

Soybean planted area for 2009 is expected to increase for a second year to a record 76 million acres, 0.3 million higher than last year. Higher intended soybean and rice plantings are not expected to offset declines in wheat, cotton, and feed grains. Corn area is expected down one percent to 85 million acres. Rising mandates for ethanol use are expected to support demand and corn prices. Net returns for corn remain favorable to those for soybeans, but the sharp year-to-year drop in expected returns will limit plantings. Wheat planted area is projected at 58.6 million acres, down 4.5 million from last year as winter wheat seedings fell 3.4 million acres last fall and spring wheat acres are expected to be lower with soybeans a more attractive option in the Northern Plains.

In 2008/09, **global wheat** production exceeded expected global consumption by almost 36 mmt, creating record world supplies of wheat and declining prices. As a result, pressure to expand wheat production has receded since last year. Producer incentives to plant wheat were reduced by lower prices and high fertilizer costs last fall. Late row-crop harvesting also limited seeding opportunities in the eastern Corn Belt, Delta, and Central Plains.

U.S. **wheat** production is expected to decline in 2009/10 with lower acreage and a return to trend yields following last year's record. Despite a nearly 15 percent reduction in expected production, wheat supplies are expected to be up just one percent with beginning stocks up sharply from a 60 year low in 2008/09. U.S. wheat ending stocks are also projected to build slightly in 2009/10 as slow growth in domestic use and lower exports more than offset the expected decline in production. Wheat exports are projected down three percent as global wheat production in 2009/10, although down from this year's record, is expected to be the second highest ever.

Wheat prices are expected to remain under pressure from large domestic and foreign supplies. The season average farm price is projected at $5.10 per bushel, down $1.70 from the mid-point of the 2008/09 projection. Limited world wheat supplies last summer supported U.S. exports and prices during June through September when producers normally market more than half of their crop. The record 2008/09 farm price reflects forward contracting last year at prices well above $7 per bushel. Similar pricing opportunities have not been available for 2009-crop wheat.

U.S. **corn** production for 2009/10 is projected up one percent as a return to trend yields more than offsets the one percent decline in planted area. Domestic demand is projected higher as a small decline in feed and residual use is more than offset by higher corn use for ethanol. Corn feed and residual use declines two percent as animal numbers continue to contract through 2009 and higher ethanol production increases supplies of distillers' grains.

Rising mandates for ethanol use are expected to support corn demand and prices in 2009/10. Mandated ethanol use less the ethanol derived from advanced biofuel under the Renewable Fuel Standard (RFS) program rises from 10.5 billion gallons in 2009 to 12.0 billion gallons in 2010 (*figure 2*). On a crop year basis, that translates into about 11.5 billion gallons of ethanol demand for crop year 2009/10. Reflecting this increase, corn used to produce ethanol is expected to increase 11 percent. At the projected 4.1 billion bushels, ethanol use will account for 33 percent of expected corn use in 2009/10, up from a forecast 31 percent this year.

The U.S. ethanol industry remains under significant financial pressure as the result of current economic conditions including historic volatility in energy and corn prices over the past year. Slowing gasoline consumption and lower prices have reduced incentives for blending ethanol in recent months. Excess ethanol production capacity weighs on ethanol producer returns even as more plant capacity becomes available. Ethanol plant data reported by the Renewable Fuels Association (RFA) put ethanol production capacity at 12.4 billion gallons as of January 2009, including plants currently not operating, with another 2.1 billion under construction or expansion. About 2.0 billion gallons or more of plant capacity has been idled. Excess capacity is expected to continue to limit returns for ethanol producers. The 2009/10 ethanol corn use forecast suggests that as much as 15 percent of ethanol production capacity will be idle during the 2009/10 marketing year (*figure 3*).

Corn exports are projected nine percent higher in 2009/10. Global corn imports are expected to show some modest recovery as global livestock production begins to rebound in 2010. World corn demand is also expected to benefit from reduced availability and use of feed-quality wheat.

Ending stocks for 2009/10 are projected to decline as increases in total corn use outpace the growth in supplies. The season average farm price is projected at $3.80 per bushel, down $0.30 per bushel from the mid-point of 2008/09 forecast range. Declines in cash prices are not expected to be as large as implied by the year-to-year change in the projected farm price. Farm prices in 2008/09 have been well above cash market levels as producers benefit from forward prices contracted last spring and summer. Similar pricing opportunities have not been available to support farm prices in 2009/10.

Global oilseed production for 2008/09 is projected at a record 408 million tons, up four percent from 392 million produced in 2007/08. Much of the increase is attributed to a sharp expansion of area planted to sunflowerseed and rapeseed as producers around the world responded to high prices. Global soybean area also increased sharply, but lower yields in South American countries limited the gain in production.

South American soybean production continues to account for almost half of global production. Brazil and Argentina are projected to account for 45 percent of global soybean production, up from 40 percent 7 years ago. At a projected 100 million tons, combined 2008/09 production for these two countries exceeds U.S. production by about 25 percent despite drought in Argentina and southern Brazil.

Brazil and Argentina account for just under half of global soybean trade in 2008/09, with the U.S. accounting for about 43 percent. The U.S. share has declined from about 55 percent 7 years ago.

China's soybean imports now account for 49 percent of global imports, up from 34 percent in 2002/03 as soybean import penetration continues to grow (*figure 4*). China has accounted for virtually all of the growth in world trade over the same time period. Soybean imports by the world's second largest importer, EU–27, have declined over the same period.

U.S. **soybean** production is expected to increase from 2008/09 with record planted area and a return to trend yields. Increased area is expected to come from reduced wheat, cotton, and peanut plantings. Although soybean plantings are projected to increase from 2008/09, lower double cropping of soybeans is expected due to lower soybean prices and reduced winter wheat area in the Delta and Eastern Corn Belt. With beginning stocks below year-earlier levels, increased production will result in a seven percent increase in soybean supply for 2009/10.

U.S. soybean crush is projected to increase modestly to 1.675 billion bushels reflecting mainly increased export prospects due to constrained South American supplies for the first half of the 2009/10 marketing year. With minimal growth in animal numbers for 2009/10 and increased substitution of corn by-products and other protein meals in rations, growth in soybean meal domestic disappearance is projected at just above one percent. With the exception of 2008/09, soybean meal feeding in the U.S. is expected to be the lowest in 10 years.

Total domestic soybean oil disappearance is projected to decline in 2009/10 as biodiesel use remains flat and food use declines. Despite an increase in the mandated biodiesel level, growth in soybean oil used for biodiesel is not expected due to the

continuing growth in use of other fats and oils. Soybean oil now accounts for about 50 percent of total oil used for biodiesel, down from around 85 percent 2 years ago. Substitution for transfats and slow growth in the economy are expected to result in the fifth consecutive year of declining soybean oil use in the domestic food market. Soybean meal and oil prices are projected at $260 per ton and $0.31 per pound, respectively compared with $285 per ton and $0.30 per pound in 2008/09.

With drought-reduced crops and lower stocks expected in South America, and sharply higher domestic supplies, U.S. soybean exports are projected to reach a record 1.225 billion bushels in 2009/10. With increased supplies exceeding gains in crush and exports, soybean stocks are projected to rise 68 percent to 311 million bushels. This would be the highest level since the record of 574 million bushels in 2006/07. Prices are projected to decline to $8.50 per bushel, the lowest since 2006/07.

South American soybean production is expected to rebound from drought-reduced levels of 2008/09 as yields return to trend. Planted area is not expected to rise significantly due to relatively low prices. With limited supplies available until harvest in the spring of 2010, trade shares for South America are likely to decrease in 2009/10. Global demand for soybeans is likely to expand only modestly, mostly due to growth in China. Shipments to EU–27 could also rise as demand for soybean meal is likely to be rebound with less availability of other grains.

U.S. **cotton** planted area for 2009 is projected at 8.8 million acres, down seven percent from 2008. Planted area would be the lowest since 1983 and a 42 percent reduction from the recent high of 15.3 million acres planted in 2006. More favorable returns for alternative crops, especially soybeans and corn, are the primary reason for the decline, but reduced access to irrigation in the Far West is also a factor. Harvested area is projected at 8.0 million acres based on a historical average abandonment of nine percent, compared with 18.4 percent in 2008. With a projected yield per harvested acre of 810 pounds, production of 13.5 million bales is also the same as last season. Domestic mill use is projected marginally higher and exports slightly lower, with a resulting decline of 1.4 million bales in U.S. ending stocks to 5.9 million bales, or about 40 percent of use. The U.S. season average price is projected to rise eight percent to 53¢ per pound.

The **world cotton** outlook for 2009/10 includes slightly lower production and slightly higher consumption. Global production is likely to fall once again in response to depressed world cotton prices, tight credit, and more favorable returns for other crops. In contrast, world cotton consumption is forecast to rise two percent as the world economy begins to recover from the current global recession in late 2009 or early 2010. World ending stocks of 56 million bales are projected about ten percent below the beginning level but are expected to be adequate to support demand.

Livestock, Poultry, and Dairy: The livestock, poultry, and dairy sectors are being challenged by weakening domestic and global demand for meat and dairy products. Uncertain demand, coupled with relatively high feed prices, caused producers to start cutting back, or slow production by the last quarter of 2008. The pullback in output is expected to continue through most of 2009, with total meat production down about two percent from 2008, and milk production declining about 0.8 percent.

The recent *Cattle* report indicated that cattle inventories declined 1.6 percent in 2008 and that producers were holding two percent fewer beef replacement heifers on January 1. These numbers combined with downward revisions to January 1, 2008, estimates, point to tight cattle supplies in 2009 and lower beef production.

Beef production is forecast to decline around one percent in 2009. Steer and heifer slaughter declines as fewer cattle are available for marketing, but cow slaughter will likely remain relatively high as the dairy herd is reduced. U.S. beef imports are forecast to increase about six percent as foreign exporters increase shipments to the U.S. as other global markets weaken. U.S. beef exports are expected to be about unchanged from 2008 as a global recession undercuts exports and a strengthening of the U.S. dollar makes U.S. beef relatively more expensive. Per capita disappearance of beef in the United States is expected to decline about one percent.

The March *Quarterly Hogs and Pigs* report indicated that hog producers farrowed about three percent fewer sows during the first quarter of 2009, and intend to farrow about 3–4 percent fewer sows during the next two quarters. Recent growth in pigs per litter has been substantial and expected to partially offset the effects of reduced farrowings on slaughter levels in 2009. In addition, live hog and pig imports from Canada are forecast about 25 percent lower than 2008, further reducing the number of hogs available for marketing this year.

Pork production for 2009 is forecast to decline one to two percent. Pork imports are forecast about one percent higher than last year's level. Pork exports are forecast to fall 14 percent to 4 billion pounds. Strong foreign demand, especially in

China, for U.S. pork during 2008 boosted exports almost 50 percent last year. This year, weak global demand will dampen export growth. China, which grew rapidly as an export market last year, is expected to have much lighter demand for imported pork in post-Olympics 2009 as well as larger domestic supplies as production recovers from hog disease outbreaks. U.S. per capita disappearance of pork is expected to increase more than one percent as a smaller share of pork output enters export channels.

Broiler meat production for 2009 is forecast to decline three percent and turkey output is forecast to fall about four percent. The poultry sector was hit hard by high feed prices in 2008. Returns sank and producers began to reduce chick and poultry placements by the middle of last year. The production cuts are expected to continue through the third quarter for broilers and for the entire year for turkeys. Broiler exports reached a record of nearly 7 billion pounds in 2008, but exports for 2009 are forecast to drop 13 percent because of across-the-board weakness in demand and downwardly revised quotas by Russia. Turkey exports also reached a record 676 million pounds last year, but are expected to drop almost 11 percent this year. Per capita disappearance of poultry meat is expected to decline one percent in 2009.

Cattle, hog, and turkey prices in 2009 are expected to be lower as a weak demand outlook more than offsets usual gains from tighter supplies (*table 2*). Broiler prices are the exception. Fed cattle will be about $6 per cwt lower than 2008, and hogs about $1 per cwt lower. Turkey prices are expected to be 2¢ per pound lower. However, broiler prices are expected to be about 3¢ per pound higher as production cuts are fairly sharp and broiler meat's relatively low price compared to other meats should benefit broiler prices.

Sharply lower returns to producers result in lower milk production for 2009. The estimated milk-feed ratio for 2009 is expected to be a contractionary 1.50 (*figure 5*). Cow numbers are expected to decline during 2009 with an acceleration in the last half of the year. For 2009, foreign demand for dairy products will be weakened by global recession, and increased exportable supplies from other suppliers dampens prospects for U.S. commercial exports. Dairy product prices dropped sharply at the end of 2008 as demand fell. The much weaker outlook results in sharp drops in dairy product prices and Class III and Class IV milk prices. The all-milk price for 2009 is forecast to decline to $11.25 to $11.85 per hundredweight (cwt), the lowest since 1978.

Farm Finances, Real Estate Values, and Credit

On February 12, USDA's Economic Research Service (ERS) released the farm income and costs forecasts for 2009. ERS forecasts net cash income at $77.3 billion, down $16.1 billion from 2008 (*figure 6*). Crop receipts are forecast at $162.4 billion in 2009, down $18.7 billion from 2008, but still the second highest on record. Livestock receipts for 2009 are forecast at $132.2 billion, down $10.9 billion from 2008. Lower input costs such as feed, fuel, and fertilizer will mean lower cash expenses. ERS forecasts total cash expenses at $246.8 billion, down $14 billion from 2008 levels.

The farm financial picture going into 2009 remains favorable with total farm debt equal to 9.1 percent of total assets (compared to over 20 percent in the mid-1980s). The debt-to-asset ratio has declined steadily from 15.2 percent in 1998. The decline in the debt-to-asset ratio over that period was due to the strong appreciation in land values, which increased by over $1 trillion from 1998 to 2008. ERS forecasts the value of farm assets to rise by 1.6 percent in 2009, the smallest increase since 1991.

While farm real estate values remain significantly higher than last year, recent Federal Reserve Bank surveys showing fourth quarter declines in land values in the 5th (Richmond), 7th (Chicago), 9th (Minneapolis), 10th (Kansas City), and 11th (Dallas) districts gives further credence to the view that land markets have softened (*table 3*). Only farm real estate values in the 12th (San Francisco) district recorded an increase in farm real estate values in the fourth quarter of 2008. This follows double digit declines for much of farm real estate since late 2007.

Despite the weakened economic outlook for farmers, most of the districts reported the availability of funds was higher in the fourth quarter of 2008 than in the third quarter of 2008. However, collateral requirements for non real-estate farm loans are becoming more restrictive. In the 7th district, 22 percent of district banks raised their collateral requirements during the fourth quarter and almost 50 percent reported tighter credit standards compared to last year. Similarly, in the 9th district, only five percent of survey respondents said they had refused a loan due to a shortage of funds, but 21 percent of lenders reporting increased collateral requirements during the fourth quarter. Survey results from the 10th district also showed that while the funds availability index rose in the fourth quarter, collateral requirements increased to a 5 year high with more than a quarter of survey respondents expecting

credit standards to tighten further in 2009. Last, survey respondents in the 11th district also reported that while there are still funds available for lending, the amount of collateral required has increased.

The downturn in the general economy may also be having an adverse effect on off-farm income sources for farm households. Based on the 2007 Agricultural Resources Management Survey conducted by the ERS, almost all farmer households earn a portion of their income from off-farm sources (*table 4*). Two-thirds of all farm households reported income from wages and salaries from off-farm employment and almost ¼ of farm households reported income from an off-farm business. The share of households reporting wage and salary income was highest for the rural residence farms at 73 percent. Nonetheless, more than half (54 percent) of households associated with commercial farms reported earning income from off-farm employment. Dividend earnings were reported by 36 percent of farm operator households in 2007. In contrast with earnings from off-farm employment, commercial farm households had the highest percentage reporting dividend income at 50 percent compared with only 32 percent of rural residence farm households.

Conclusions

With confidence in financial markets weakened and the global economy in the worst recession since prior to World War II, the agricultural economy faces much uncertainty. As expected, most aggregate measures are forecast to be down sharply from the record highs reached last year. Concerns with deflationary pressures remain, particularly if lower farm receipts persist over the longer run. This could adversely affect farm real estate values and undermine what has been to date a relatively strong financial position. That said, the outlook is for a return to higher prices as many of the pressures that drove last year's price increases—high energy prices, the Renewable Fuel Standard, and strong economic growth in emerging markets—will return to play a major role. In addition, while other sectors of the economy may be credit constrained, many farm lenders appear to be in good financial shape and access to credit for farmers appears to be sufficient.

ATTACHMENTS

Figure 1--U.S. Agricultural Trade

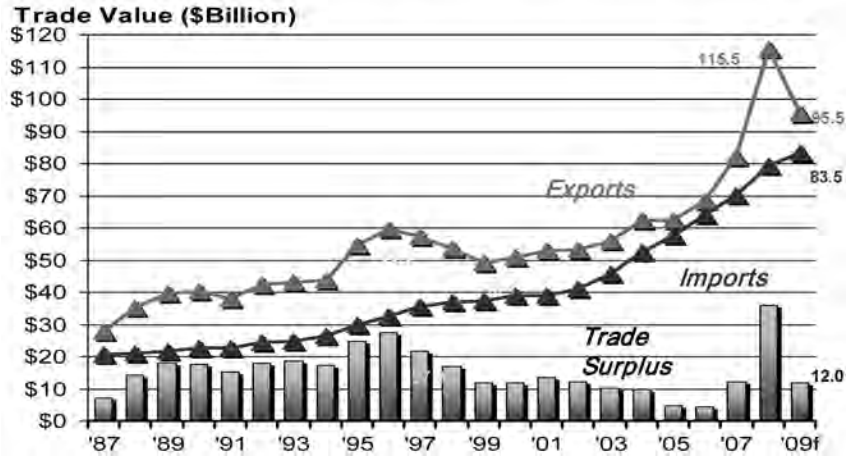
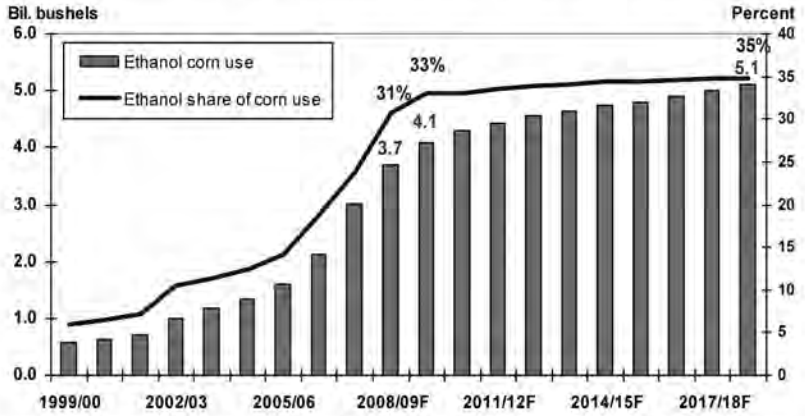
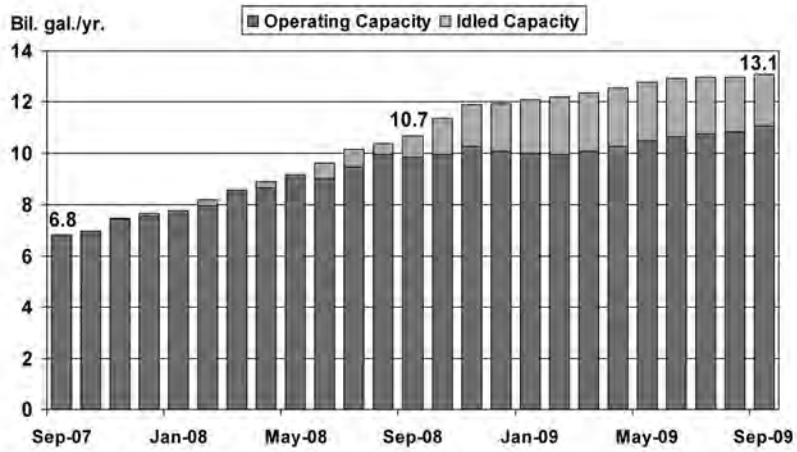


Figure 2--U.S. Corn Used for Ethanol 1995/96 through 2018/19F



Note: 2008/09 is projected based on the *World Agricultural Supply and Demand Estimates*, March 11, 2009. 2009/10 is projected based on USDA's *Grains & Oilseeds Outlook*, Agricultural Outlook Forum, Washington, D.C., February 27, 2009. Projections for 2010/11-2018/19 are from USDA, *Agricultural Projections to 2018*, February 2009.

Figure 3--U.S. Ethanol Production Capacity



Source: USDA-WAOB internal estimates and projections, March 11, 2009.

Figure 4--China soybean import dependence continues to grow

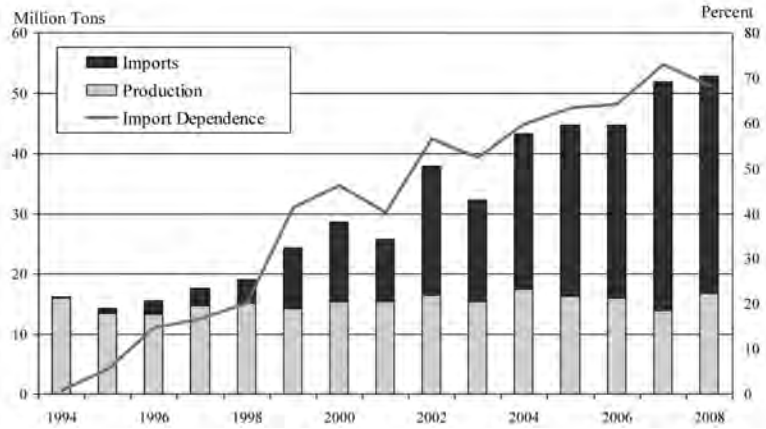


Figure 5--Milk price-to-feed ratio falls to lowest level since 1983

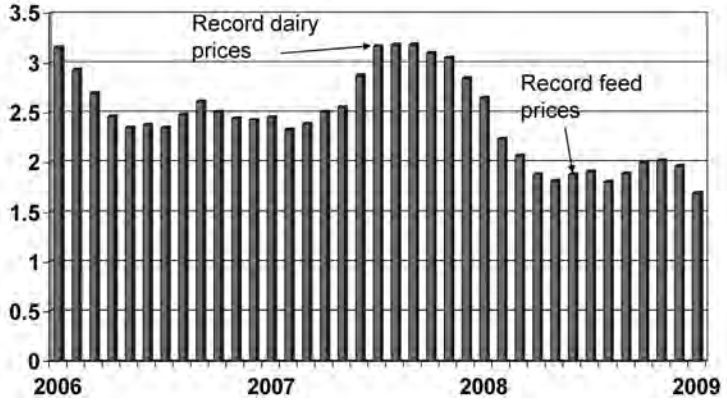


Figure 6--Net cash farm income

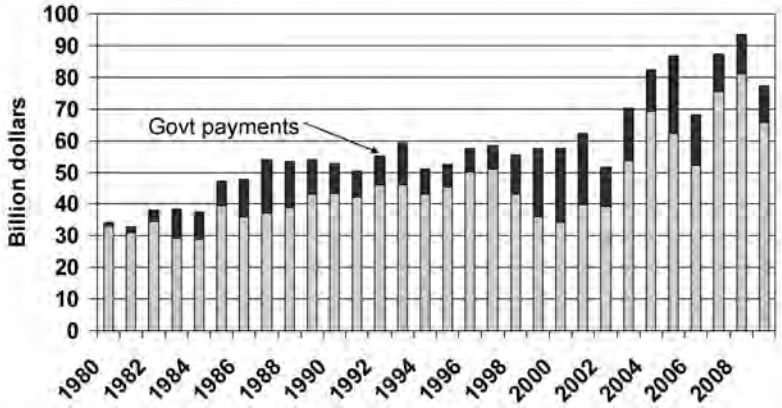


Table 1—Planted Acreage

Crop	2007	2008	2009 1/	% Change
Corn	93.5	86.0	85.0	-1.2
Minor feed grains	15.5	15.7	14.3	-8.9
Soybeans	64.7	75.7	76.0	+0.4
Wheat	60.5	63.1	58.6	-7.1
All cotton	10.8	9.5	8.8	-7.0
Rice	2.76	3.00	3.18	+6.3
8 crop total	247.8	253.0	245.9	-2.8
CRP	36.8	34.8	34.0	-2.3

1/ *Prospective Plantings*, March 31, 2009.

Table 2--Farm Economic Indicators

Ag. Trade (Bil. $)	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09F
Total exports	52.7	53.3	56.0	62.4	62.5	68.6	82.2	115.4	95.5
Asia	20.1	19.4	21.6	24.4	22.5	24.9	29.3	43.3	34.4
Canada	8.0	8.6	9.1	9.6	10.4	11.6	13.3	16.2	15.8
Mexico	7.3	7.1	7.7	8.4	9.3	10.4	12.3	15.6	14.8
Total imports	39.0	41.0	45.7	52.7	57.7	64.0	70.1	79.3	82.5
Farm Income (Bil. $)	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009F**
Cash receipts	200.1	195.0	215.6	237.2	240.9	240.8	284.8	324.2	294.6
Gov't payments	22.4	12.4	16.5	13.0	24.4	15.8	11.9	12.4	11.4
Gross cash income	237.4	222.3	247.8	267.3	284.5	274.1	313.4	354.3	324.1
Cash expenses	175.2	170.8	177.6	185.0	194.8	206.0	226.0	260.9	246.8
Net cash income	62.2	51.5	70.2	82.3	86.6	68.0	87.4	93.4	77.3
Commodity Prices 1/	**Unit**	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**	**2006/07**	**2007/08**	**2008/09F**
Wheat	$/bu	2.78	3.56	3.40	3.40	3.42	4.26	6.48	6.70-6.90
Corn	$/bu	1.97	2.32	2.42	2.06	2.00	3.04	4.20	3.90-4.30
Soybeans	$/bu	4.38	5.53	7.34	5.74	5.66	6.43	10.10	8.85-9.85
Rice	$/cwt	4.25	4.49	8.08	7.33	7.65	9.74	12.80	15.50-16.50
Cotton (Upland)	cents/lb	29.8	44.5	61.8	41.6	47.7	46.5	59.3	46.0-52.0
		2002	**2003**	**2004**	**2005**	**2006**	**2007F**	**2008F**	**2009F**
Hogs	$/cwt	34.92	39.45	52.51	50.05	47.26	47.09	47.84	45-48
Steers	$/cwt	67.04	84.69	84.75	87.28	85.41	91.82	92.27	84-89
Broilers	cents/lb	55.6	62.0	74.1	70.8	64.4	76.4	79.7	81-86
Milk	$/cwt	12.18	12.55	16.13	15.19	12.97	19.13	18.32	11.25-11.85
Gasoline	$/gallon	1.39	1.60	1.89	2.31	2.62	2.81	3.26	1.96
Diesel	$/gallon	1.32	1.50	1.81	2.41	2.71	2.88	3.80	2.19
Natural gas (wlhd)	$/K cu.	2.95	4.89	5.50	7.45	6.41	6.39	8.08	4.22
Electricity	$/kwh	8.45	8.70	8.97	9.45	10.40	10.60	11.30	11.40

1/ Agricultural commodity price forecasts are from USDA, World Agricultural Supply and Demand Estimates report, Mar 2009. Energy prices are from Energy Information Administration, Short Term Energy Outlook, Mar 2009.
F=forecast.

Table 3--Percentage Change in Fourth Quarter 2008 Farm Real Estate Values, Federal Reserve Bank Districts.

		Percentage change from 1 year ago	Percentage change from 3rd Quarter
Federal Reserve Bank of Richmond -5th District			
	District Ave.	-8	-1
Federal Reserve Bank of Chicago – 7th District			
	District Ave.	5	-4
	Illinois	6	-3
	Indiana	-1	-4
	Iowa	4	-6
	Michigan	2	-4
	Wisconsin	13	0
Federal Reserve Bank of Minneapolis – 9th District			
	Non-irrigated		-4
	Irrigated		-1
	Ranchland		-1
Federal Reserve Bank of Kansas City – 10th District			
	Non-irrigated	7	-3
	Irrigated	11	-1
	Ranchland	6	-2
Federal Reserve Bank of Dallas – 11th District			
	Dryland	7	0
	Irrigated	9	2
	Ranchland	-1	-2
Federal Reserve Bank of San Francisco – 12th District			
	Dryland	2	23
	Irrigated	23	11
	Ranchland	5	2

Source: Board of Governors of the Federal Reserve System. *Agricultural Finance Databook*. First Quarter 2009.

Table 4. Farm household off farm income components, by Farm Service Agency condensed typology grouping w/no limited resource category, 2007.

Item	Farm Service Agency condensed typology			
	Rural Residence Farms	Intermediate Farms	Commercial Farms	All
Number of farms	1,311,855	540,904	165,946	2,018,706
	Dollars per family farm			
Total off-farm income	93,966	48,116	44,543	77,618
Share Reporting (%)	98	91	87	95
- Off-farm wages and salaries	60,947	24,483	22,485	48,015
Share Reporting (%)	73	54	54	67
- Off-farm business income	12,429	5,643	7,326	10,191
Share Reporting (%)	23	26	19	23
- Interest	2,167	2,397	3,606	2,347
Share Reporting (%)	50	58	59	52
- Dividends	2,998	1,975	3,788	2,789
Share Reporting (%)	32	43	50	36
- Social Security	11,084	10,410	4,201	10,337
Share Reporting (%)	45	55	26	46
- Other	4,341	3,208	3,137	3,938
Share Reporting (%)	20	26	19	22

Source: 2007 USDA Agricultural Resource Management Survey.

The CHAIRMAN. Thank you very much. I appreciate that. Dr. Henderson.

STATEMENT OF JASON R. HENDERSON, PH.D., BRANCH EXECUTIVE AND VICE PRESIDENT, OMAHA BRANCH, FEDERAL RESERVE BANK OF KANSAS CITY, OMAHA, NE

Dr. HENDERSON. Thank you, Mr. Chairman and Members of the Subcommittee. My name is Jason Henderson. I am Vice President and Branch Executive of the Federal Reserve Bank of Kansas City, Omaha Branch, and I appreciate the opportunity to talk with you about some of our findings regarding agricultural credit demand and availability.

The recession and fragile financial markets have raised concerns about credit availability for agricultural borrowers. Farm commodity prices have fallen after last summer's boom, reducing cash flows, and trimming intermediate and long-term investment demand for farms and equipment.

At the same time, demand for operating loans has risen, due to lower cash flows and higher production costs. Shrinking cash flows and higher costs limited farmers' ability to pay off existing operating loans, and commercial bankers have reported an increase in farm carryover debt, with lower loan repayments. Agricultural bankers appear to have ample funds to meet rising loan demand. Agricultural lenders are expanding their loan volume of agricultural loans, and they have done so at historically low interest rates.

My colleagues and I at the Federal Reserve Bank of Kansas City survey agricultural bankers in our seven state region four times a year to track developments in the farm economy. In our latest survey, few bankers reported refusing a loan due to a shortage of funds. Nationally, farm loan volumes rose at a record pace in 2008, and during the first quarter of 2009, operating loan volumes jumped again. Banks continue to report they are increasing their use of loan guarantees from the Farm Service Agency and seasonal credit from the Federal Reserve discount window, and other agricultural lenders, such as the Farm Credit System, the Farm Service Agency, and Farmer Mac appear to have also increased their loan portfolios. Business contacts also suggest that life insurance companies and vendor creditors are still active in agriculture markets.

While agricultural lenders are meeting credit needs, they have altered loan terms and tightened credit standards, requiring more documentation and collateral to mitigate increased agricultural risk. Delinquency rates and charge-offs on agricultural loans have edged up in 2008, but they are historically low, and well below delinquency and charge-off rates on other types of loans.

Still, commercial bankers have responded by raising collateral requirements on operating loans. Banks also reduced the term of operating loans, as they were more reluctant to extend loans for longer periods of time. Our research also indicates that smaller farm operations, and those owned by young and beginning farmers, are more likely to be denied credit, but various programs are already in place to assist these borrowers.

While the recession poses challenges to agricultural credit availability, agricultural lenders appear to be in a position to meet agri-

cultural credit demands. Nationally, agricultural banks are posting stronger returns than their banking peers. Stronger returns should help underpin agricultural lending. Banks are raising funds from a variety of sources, equity and debt markets, deposits, and non-traditional sources, such as Federal home loan banks, but despite low interest rates on CDs and other savings vehicles, bank deposits continue to expand, which will help provide funds for agricultural loans.

The cost of funds for financial institutions has eased. After soaring in September 2008, the London Inter-Bank Offered Rate, or the LIBOR, a benchmark for short-term interest rates, has fallen, lowering the cost of funds. And while our survey indicates that farmland values edged down at the end of 2008, land values, which are a major source of collateral, remain well above year ago levels, and anecdotal reports from our business contacts indicate that farmland values have potentially stabilized in the first quarter of 2009.

Finally, in rural America, an interdependency exists between Main Street and the farm gate. Rural America avoided the worst of the recession in 2008 due to residual strength in farm and energy industries, and a shallower decline in housing activity than elsewhere in the nation. Job losses were less prevalent, and rural home values continued to appreciate, in contrast to sharp national declines.

While the recession has begun to weigh on the rural economy, the relative economic strength in rural communities could help limit losses on other types of loans and support world lending.

In sum, economic prospects for the rural economy have dimmed and raised concerns about the availability of credit for agricultural enterprises. Delinquency rates and charge-offs have edged up, and credit standards have tightened on agricultural loans. While agricultural borrowers are being asked to accept more of the financial risk emerging from a volatile agricultural environment, credit remains available for creditworthy borrowers.

Mr. Chairman, thank you for inviting me today, and I will be happy to respond to any questions at the appropriate time.

[The prepared statement of Dr. Henderson follows:]

PREPARED STATEMENT OF JASON R. HENDERSON, PH.D., BRANCH EXECUTIVE AND VICE PRESIDENT, OMAHA BRANCH, FEDERAL RESERVE BANK OF KANSAS CITY, OMAHA, NE

Mr. Chairman and Members of the Subcommittee, my name is Jason Henderson and I am the Vice President and Branch Executive of the Federal Reserve Bank of Kansas City—Omaha Branch. I appreciate the opportunity to talk with you about agricultural credit conditions in the current economic and financial environment.

Agricultural Credit Conditions

The economic and financial downturn has weakened the farm economy and raised concerns about access to credit for agricultural borrowers. Shrinking global demand, falling commodity prices, and higher production costs have trimmed farm profits. As a result, reduced cash flows have raised the demand for credit by agricultural enterprises.

While agricultural borrowers are concerned about credit availability, agricultural lenders are equally concerned about the creditworthiness of their borrowers as the farm economy weakens. Delinquency rates and charge-offs on agricultural loans remain near historically low levels but have edged up recently, eroding loan quality. Consequently, agricultural lenders have tightened credit standards on various types of agricultural loans. Agricultural enterprises most susceptible to being denied credit are small farm operations owned by young or beginning farmers.

Despite these risks, ample credit appears available at historically low interest rates. Profitability in agricultural banks and relative strength in the rural economy could support rural lending. Still, the recent erosion in agricultural loan quality has led agricultural lenders to tighten credit standards and shift more financial risk to borrowers.

Agricultural Credit Demand

My colleagues and I at the Federal Reserve Bank of Kansas City survey agricultural bankers in our seven-state region four times a year to track developments in the farm economy. Our recent data indicate weakness in the agricultural economy has shifted demand for loans toward financing short-term investments. With profits shrinking, plans have slowed for capital purchases such as farmland and equipment, which require intermediate and longer term investments (*Chart 1*). At the same time, the demand for operating loans has risen, due to lower cash flows and higher production costs.

Agricultural producers' capital spending plans have fallen amid weaker farm income expectations. When profits rise, farmers and ranchers typically use higher cash flows to pay for various types of capital expenditures. Capital spending was stronger in 2008, coinciding with stronger farm incomes. Strong farm spending, in turn, helped insulate the rural economy from the worst of the recession in 2008 (Henderson and Akers).

While strong farm incomes boosted farmland and machinery sales over the past few years, these sales have slowed recently as farm income expectations weakened. In the fourth quarter of 2008, farmland sales in the Kansas City Fed's district had fallen from the previous year.[1] Moreover, capital spending had slowed markedly with further declines expected in 2009. Similarly, the Association of Equipment Manufacturers recently reported slower growth in farm tractor and combine sales.[2] Anecdotal reports indicate further contractions in machinery and farmland sales through 2009.

In contrast to capital spending, operating loan demand continues to rise steadily. Operating loan demand often rises when prices fall and revenues decline. Shrinking cash flows constrain farmers' ability to pay off existing operating loans, leading to an increase in carry-over debt. At the end of 2008, commercial bankers reported an increase in farm carry-over debt as loan renewal or extensions jumped and loan repayment rates declined.[3]

Higher production costs also increased operating loan demand. Since the 1920s, farm production costs have risen at an average pace of almost two percent a year, but in 2008, production costs surged 11.7 percent.[4] The largest gains emerged from energy-derived inputs—fuel, fertilizer, electricity and pesticides. Livestock producers faced a surge in feed costs. While some decline is expected in 2009, farm production costs—especially for crop producers—are expected to remain historically high, raising the credit demand of agricultural enterprises.

Agricultural Loan Activity

Agricultural lenders appear to be expanding loanable funds to meet rising loan demand. Commercial banks continue to report ample funds for agricultural loans. In general, they have expanded their total volume of agricultural loans, and they have done so at historically low interest rates. Moreover, government sponsored lenders have also expanded agricultural loan activity.

According to the Federal Reserve Bank of Kansas City's fourth quarter survey, 70 percent of bankers reported the same amount of funds available for farm operating loans as the year before. An additional 14 percent reported having more funds available. Moreover, these banks expected to have roughly the same amount, if not more funds, available for lending in the first half of 2009.

Few bankers were refusing loans due to a shortage of funds. In December 2008, only 4.3 percent of bankers in the Kansas City survey reported refusing a farm loan due to a shortage of funds. This refusal rate was up slightly from levels reported in previous quarters and on par with levels reported prior to 2008.

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[1] The Kansas City Federal Reserve District covers the states of Colorado, Kansas, Nebraska, Oklahoma, Wyoming, northern New Mexico, and western Missouri. See Henderson and Akers (2008) for more information.

[2] Tractor and combine sales data were obtained from *U.S. Ag Flash Reports,* Association of Equipment Manufacturers.

[3] Indexes on farm loan renewals or extension and repayments rates are available from the *Agricultural Finance Databook,* Board of Governors of the Federal Reserve System, *www.federalreserve.gov.*

[4] Farm production costs were obtained from the Farm Income and Costs Briefing Room, Economic Research Service, U.S. Department of Agriculture, *www.ers.usda.gov.*

The Kansas City survey data are consistent with other national reports, which have also shown increased agricultural loan activity. Farm loan volumes rose sharply in 2008, led by record gains in farm real estate loans.[5] In the first quarter, commercial banks greatly expanded farm operating loan volumes (*Chart 2*).[6] Rising loan volumes were driven by expanding the number and size of farm operating loans.[7]

Other agricultural lenders are also extending more credit to agricultural enterprises. For example, the Farm Credit System significantly expanded its agricultural real estate mortgages and production/intermediate term loan volumes in 2008. The Farm Service Agency experienced a rise in its direct operating loan portfolio, although its guaranteed loan portfolio eased. And, Farmer Mac loans and guaranteed securities rose in 2008.

Commercial banks appear to be tapping Federal Government and Federal Reserve funds. In response to higher risk, commercial bankers indicate they are increasing their use of guarantees from the U.S. Department of Agriculture's Farm Service Agency. In January 2009, Farmer Mac and the Independent Community Bankers Association initiated a program to improve credit availability for farm real estate mortgages. Moreover, smaller commercial banks have access to primary and secondary credit funds through the Federal Reserve's discount window and can request funds for seasonal credit, especially during the planting and harvest seasons, when funding needs are more significant.[8]

Agricultural enterprises are also receiving credit at historically low interest rates. According to agricultural credit surveys by the Federal Reserve, interest rates on all types of agricultural loans have dropped significantly below 2006 levels.[9] In the Kansas City Federal Reserve district, the average interest rate on operating loans declined to 7.0 percent in the fourth quarter of 2008.[10]

Tighter Credit Standards

While agricultural lenders are generally extending credit at lower interest rates, they have altered loan terms and tightened credit standards in response to increased risk in agricultural lending. Agricultural loan quality has declined amid lower farm income expectations and increased volatility in agricultural markets. In response, agricultural lenders, and commercial banks in particular, have shortened loan maturities and raised collateral requirements.

In 2008, agricultural loan quality at commercial banks began to erode. After improving during the first part of the year, the average risk rating on agricultural loans edged up heading into 2009. Commercial bankers reported higher risk ratings, as livestock profits were elusive and margins declined for the crop sector.

Along with elevated risk ratings, delinquency rates and charge-offs on agricultural loans also edged up. In 2008, delinquency rates on agricultural loans climbed steadily, rising 30 percent during the year.[11] At the same time, net charge-offs on agricultural loans doubled. Delinquency rates and net charge-offs on agricultural loans were higher in the largest 100 U.S. banks.

Still, delinquency rates and net charge-offs on agricultural loans remain historically low and well below other types of loans. For example, in the fourth quarter of 2008, the delinquency rate on all types of loans and leases was more than triple the rate on agricultural loans. Similarly, net charge-offs on all loans were more than eight times the size of net charge-offs on agricultural loans.

Nevertheless, commercial bankers responding to the Kansas City survey reported raising collateral requirements on operating loans (*Chart 3*). In the fourth quarter of 2008, the collateral requirements index rose well above year-ago levels, as a quarter of the bankers reported higher collateral requirements. Higher collateral requirements on agricultural loans were also reported by commercial bankers in other Federal Reserve districts.

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[5] Summary statistics for farm real estate and non-real estate loan volumes were calculated from the Quarterly Reports of Condition of Commercial Banks and obtained from the *Agricultural Finance Databook.*

[6] Non-real estate loan volumes obtained from the Survey of Term of Bank Lending to Farmers available in the *Agricultural Finance Databook.*

[7] In the first quarter, loans to the livestock industry declined as the livestock sector struggled to post profits.

[8] More information on the Federal Reserve's discount window and seasonal credit program is available at *www.frbdiscountwindow.org/index.cfm.*

[9] Data obtained from Federal Reserve agricultural credit surveys can be obtained from the *Agricultural Finance Databook,* or from the Federal Reserve Bank of Kansas City, *www.kansascityfed.org/agcrsurv/agcrmain.htm.*

[10] During the same time, the average rate on farm real estate loans fell from roughly 8.5 percent to 6.75 percent.

[11] Charge-off and delinquency rate data were obtained from the Board of Governors of the Federal Reserve, *www.federalreserve.gov/releases/chargeoff/.*

In response to higher risk, commercial banks have also reduced the length of operating loans. For example, after steadily rising since 2001, loan maturity on agricultural loans dropped 20 percent, to 12 months, in the fourth quarter of 2008. Simply put, as agricultural risk increased, banks were more reluctant to extend loans for longer periods of time.

Recent research indicates that smaller farm operations and operations owned by young and beginning farmers are generally more likely to be denied credit, due to the limited experience and net worth and higher debt levels of the owners (Briggeman, Towe, and Morehart; Harris, *et al.*). While these types of operations are likely to have more difficulty obtaining credit in the current environment, programs are already in place to support their financial needs.

Agricultural Lending in 2009

The recession poses some risks to agricultural lending in 2009. Concerns about the availability and cost of funds and the creditworthiness of borrowers remain. However, the robust performance of agricultural banks and relative strength in the rural economy should support rural lending.

Access to funds is a persistent concern for agricultural banks. Banks raise funds from a variety of sources—equity and debt markets, deposits and nontraditional sources such as Federal Home Loan Banks. Bank deposits are a major source of loanable funds for agricultural banks. Lower interest rates on CDs and other savings vehicles could slow bank deposit growth. Yet, despite lower interest rates, domestic deposits at agricultural banks continue to expand, which should support agricultural lending.[12]

Managing funding costs is an everyday challenge for commercial banks. In September 2008, the financial crisis fueled a spike in the London Inter-Bank Offered Rate (LIBOR), a benchmark for short-term rates that banks pay to borrow funds from other banks and a measure for bank funding costs. Since then, LIBOR has declined, suggesting that funding costs have fallen, which will support agricultural lending.

Agricultural lenders are always concerned about the creditworthiness of agricultural borrowers. In 2009, profit margins are expected to narrow for crop producers and remain negative for livestock producers (Henderson and Akers). While historically low, delinquency rates and charge-offs on agricultural loans rose in 2008. Weakness in the agricultural economy could further erode the creditworthiness of agricultural borrowers and lead to tighter lending standards and higher collateral requirements on agricultural loans.

Because of their prominent use as collateral, declines in farmland values at the end of 2008 are a concern. Federal Reserve surveys indicate that farmland values edged down in the fourth quarter of 2008, but remained well above year-ago levels. Still, further declines in farmland values could shrink the amount of collateral available for agricultural loans, especially at small and mid-sized banks that more frequently use farm real estate as collateral.[13]

The strong performance of agricultural banks, which are generally relatively small banks located in rural communities, should help sustain agricultural and rural lending. The Federal Reserve defines agricultural banks as commercial banks with agricultural loans accounting for more than 14 percent of their loan portfolio.[14] In the fourth quarter of 2008, agricultural banks continued to post historically high rates of return, while all commercial banks reported negative returns (*Chart 4*). Agricultural banks also had much stronger performance than other similarly sized small commercial banks—those with less than $500 million in assets. Stronger returns should help underpin agricultural and rural lending.

Finally, the relative strength of the rural economy should support agricultural and rural lending. Last year, the relative strength of the farm and energy industries and a shallower decline in housing activity allowed rural economies to avoid the worst of the recession (Henderson and Akers). In contrast to home prices in most urban areas, rural home values continued to rise through most of 2008 (Wilkerson 2008). And, job losses were less prevalent on rural Main Streets as manufacturing and service firms that supported the agricultural and energy sectors posted strong

[12] Domestic deposit data obtained from *Statistics at a Glance,* Federal Deposit Insurance Corporation (FDIC). FDIC identifies agricultural banks as commercial banks with agricultural loans accounting for at least 25 percent of their loan portfolio.

[13] Small and mid-sized farm lenders had less than $25 million in farm loans. Large farm lenders had more than $25 million in farm loans. See the *Agricultural Finance Databook* for a more detailed description.

[14] Agricultural banks have an agricultural loan concentration higher than the average agricultural loan concentration for all commercial banks. In 2008, the average agricultural loan concentration was 14 percent.

gains. More recently, the recession has established a stronger foothold in rural America, but rural economies continue to outperform their urban counterparts. While the recession will limit rural economic gains, the relative strength in rural economies could help limit losses on other types of loans and support rural lending.

In sum, the global recession has trimmed economic prospects for the agricultural and rural economy, raising concerns about the availability of credit for agricultural enterprises. Delinquency rates and charge-offs have risen but remain at historically low levels. Agricultural lenders responded by tightening credit standards, especially for those segments of the agricultural sector experiencing losses. While agricultural borrowers are being asked to accept more financial risk, credit remains available for creditworthy borrowers.

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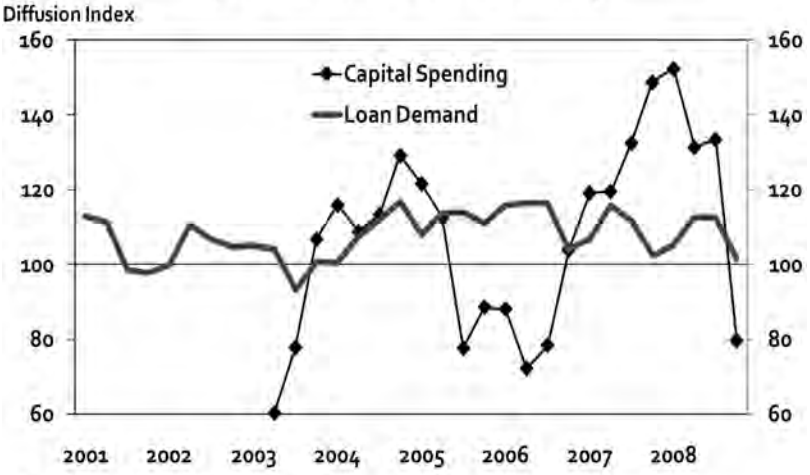
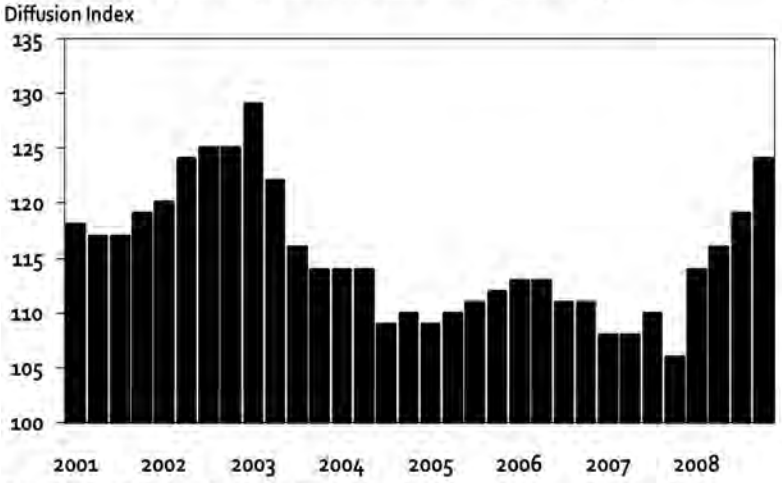
Chart 1:
Capital Spending and Farm Operating Loan Demand
(Tenth Federal Reserve District)



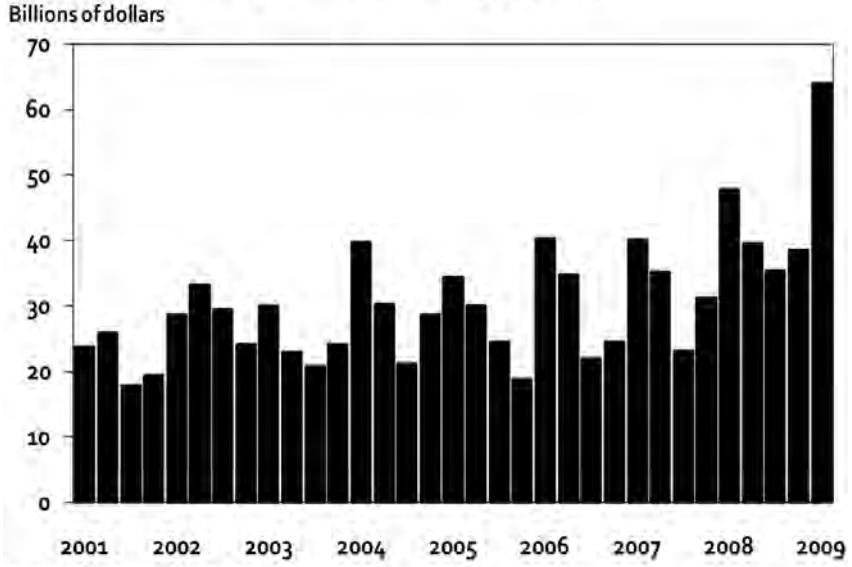
Source: Federal Reserve Bank of Kansas City
Index values above 100 indicate more bankers reported higher capital spending or loan demand, while values below 100 indicate more bankers reported lower capital spending or loan demand compared to the previous year.

Chart 2:
Collateral Requirements on Operating Loans
(Federal Reserve Bank of Kansas City)



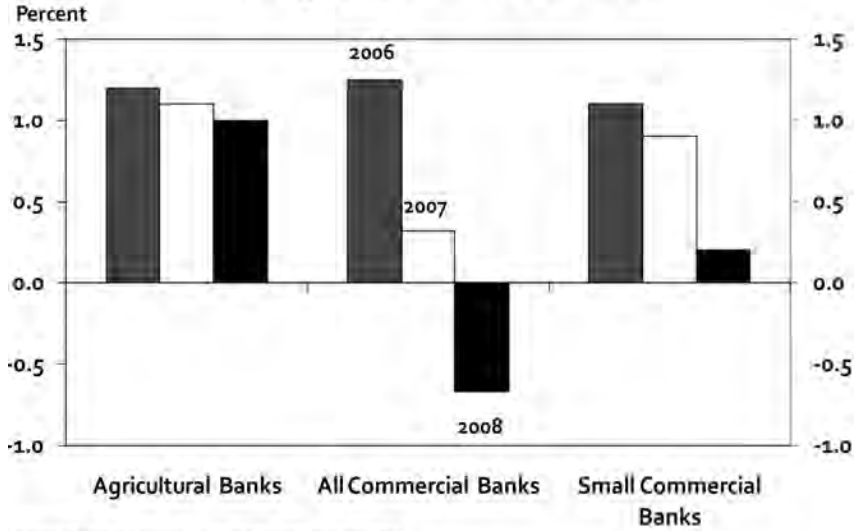
Source: Federal Reserve Bank of Kansas City
Index values above 100 indicate more bankers reported higher capital spending or loan demand, while values below 100 indicate more bankers reported lower capital spending or loan demand compared to the previous year.

Chart 3:
Volume of Non-Real Estate Bank Loans to Farmers
(Current Operating Expenses)



Source: *Agricultural Finance Databook*

Chart 4:
Average Rate of Return on Assets



Source: Board of Governors of the Federal Reserve and FDIC
Agricultural banks are banks with agricultural loans accounting for 14% or more of their loan portfolio.
Small commercial banks are banks with less than $500 million in assets

The CHAIRMAN. Thank you, Dr. Henderson. We appreciate that. Dr. Gruenspecht, we would like to hear from you at this time.

STATEMENT OF HOWARD K. GRUENSPECHT, PH.D., ACTING ADMINISTRATOR, U.S. ENERGY INFORMATION ADMINISTRATION, U.S. DEPARTMENT OF ENERGY, WASHINGTON, D.C.

Dr. GRUENSPECHT. Mr. Chairman and Members of the Committee, I appreciate the opportunity to appear before you today.

The Energy Information Administration is the independent statistical and analytical agency within the Department of Energy. We do not promote, formulate, or take positions on policy issues, and our views should not be construed as representing those of the Department of Energy or the Administration.

Agriculture is a major energy user. Diesel accounts for 51 percent of total farm energy use, motor gasoline for 16 percent, natural gas and propane for nine percent each, and electricity for 14 percent.

Agriculture also plays a significant current role as an energy supplier, as exemplified by the growth in the use of ethanol as motor fuel, and will play an even larger role in the future.

Starting with our outlook through the end of 2010, the world oil market saw a sharp price decline in the second half of last year. The price of West Texas Intermediate crude oil averaged $100 a barrel in 2008, and we expect it to be significantly below that level through 2009 and 2010, as a rebound in oil demand growth awaits economic recovery in the United States and around the world. Retail diesel fuel prices in 2009 are projected to average $2.19 per gallon, down from $3.80 per gallon in 2008.

Turning to ethanol, we expect only modest growth in ethanol consumption in 2009. In July 2007, ethanol provided an average of 425,000 barrels per day, about five percent of 2007 average daily gasoline consumption volume, or about three percent of the energy consumed by gasoline-fueled vehicles. Ethanol plants operated at or near their design capacity limits during this period. Ethanol production capacity increased by more than 50 percent in 2008, with production in December reaching 656,000 barrels per day. Production capacity grew faster than demand, and average utilization rates fell from near full utilization at the beginning of 2008 to about 85 percent by year's end, and a further drop is expected in 2009.

Before shifting to a long-term perspective, I should note that any projections are necessarily very uncertain, since long-term energy supply and demand trends are affected by many factors that are difficult to predict, such as energy prices, economic growth, advances in technologies, changes in weather patterns, and future public policy decisions. The *Annual Energy Outlook* reference case, actually just released yesterday, projects increased consumption of biofuels, including ethanol, biomass-to-liquids, biodiesel, and other non-hydroelectric renewable energy sources between now and 2030. The growing use of alternative fuels reflects both the higher prices projected for traditional fuels and support for alternative fuels provided in recently enacted Federal legislation.

Biofuels use in the reference case grows from 7.3 billion ethanol-equivalent gallons in 2007 to nearly 30 billion gallons in 2022, and nearly 39 billion gallons in 2030. The projected consumption in 2022 is less than the 36 billion gallons mandated in the Energy Independence and Security Act of 2007, because we see difficulties in rapidly ramping up the production of cellulosic biofuels. However, the other targets in that legislation are projected to be achieved.

Our reference case assumes that current laws and policies continue indefinitely. Other recent EIA analyses suggest that various policy proposals, including caps on greenhouse gas emissions or an increased renewable portfolio standard for electricity sellers, could significantly increase reliance on biomass as an energy source. Agricultural products and residues, as well as dedicated energy crops, are a key part of the overall biomass supply.

The two main concerns that appear to motivate many recent policy proposals are energy security and the reduction of greenhouse gas emissions. Our recent policy analyses, many of which were done at the request of Congress, suggest that there are both synergies and conflicts between these objectives. The situation with respect to agriculture and biomass is particularly complex. A policy focused on energy security would likely emphasize use of biofuels to decrease our reliance on imported petroleum. Such a policy would also serve to reduce greenhouse gas emissions. However, if greenhouse gas emissions were the primary policy focus, biomass could be used as a substitute for coal-fired electricity generation, to provide significantly larger carbon dioxide emission reductions. While biomass from agriculture and other sources has an important role to play in either case, the way in which biomass can best be deployed will depend on how the objectives of energy security and emissions reduction are prioritized.

That concludes my statement, Mr. Chairman, and I would be happy to answer any questions you or the other Members may have.

[The prepared statement of Dr. Gruenspecht follows:]

PREPARED STATEMENT OF HOWARD K. GRUENSPECHT, PH.D., ACTING ADMINISTRATOR, U.S. ENERGY INFORMATION ADMINISTRATION, U.S. DEPARTMENT OF ENERGY, WASHINGTON, D.C.

Mr. Chairman and Members of the Committee, I appreciate the opportunity to appear before you today to discuss developments in energy markets and their possible implications for agriculture.

The Energy Information Administration (EIA) is the independent statistical and analytical agency within the Department of Energy. We do not promote, formulate, or take positions on policy issues, but we do produce objective, timely, and relevant data, projections, and analyses that are meant to assist policymakers, help markets function efficiently, and inform the public. Our views are strictly those of EIA and should not be construed as representing those of the Department of Energy or the Administration.

Energy Use in Farming and Farming-Related Sectors

Agriculture is a major user of energy. For 2007, EIA estimates that energy use on farms totaled about 1,142 trillion British thermal units (Btu), more than one percent of total U.S. energy consumption of 101.9 quadrillion Btu. The components of farm energy consumption are as follows: diesel accounts for 51 percent of total use, motor gasoline accounts for 16 percent, natural gas accounts for nine percent, liquefied petroleum gas (LPG or propane) accounts for nine percent, electricity accounts for 14 percent, and other fuels account for two percent. In addition to direct farm

use of energy, agriculture is indirectly affected by energy requirements in the fertilizer industry, specifically in nitrogenous fertilizers. In 2007, the energy requirements of this industry, in terms of thermal content, were about 420 trillion Btu, most of which is natural gas. Natural gas is the main feedstock in the production of ammonia fertilizer. Because of the volatility and high levels of natural gas prices over the last several years, several ammonia producers are planning to convert their facilities to use less expensive coal or petroleum coke instead of natural gas. Also, as domestic ammonia producers have idled many of their plants, imports of ammonia have significantly increased, with 2007 reporting a net import reliance of 42 percent, compared to 29 percent in 2002.

Based on energy use on farms and in closely-related sectors, every dime added to the price of gasoline and diesel oil, sustained over 1 year, costs U.S. agriculture $566 million annually. Every dollar added to the price per thousand cubic feet of natural gas costs agriculture more than $96 million annually in direct expense. Every penny increase in the price per kilowatthour of purchased electricity costs agriculture about $452 million annually in direct expense. The farm sector has seen a tremendous increase in fertilizer costs, particularly ammonia. The average annual ammonia price paid by farmers rose from $250 per ton in 2002 to $523 per ton in 2007.

Agriculture as an Energy Supply Source

Testimony on the interaction between energy markets and agriculture would once have focused exclusively on agriculture's demand for energy. Today, however, the recent increase in the use of ethanol in motor fuels has focused attention to agriculture's current and potential role as an energy supplier. Ethanol use in motor fuels has grown from 1.7 billion gallons per year in 2001 to an estimated 9.6 billion gallons per year in 2008. This growth has had a substantial impact on corn demand, commodity and land prices, and planting decisions. However, notwithstanding its recent growth, ethanol still accounts for a relatively small share of overall fuel use by gasoline-powered vehicles, which totaled 137 billion gallons in 2008.

While ethanol from grain is by far the most important current energy supply activity in agriculture, other energy supply opportunities are also receiving increasing attention. Production of biodiesel fuel from oilseed crops has grown over the past decade, supported by Federal incentives. Farm wastes are increasingly being recognized as an energy resource, and their development is being promoted by Federal incentives and renewable energy portfolio mandates in many states. Farm operators are also benefiting from the growth of wind power, which is providing extra income from leases and royalties to farm operators in areas with attractive wind resources.

The forward-looking sections of this testimony, which follow, offer EIA's perspective on the short-term and long-term energy outlooks and on the future for ethanol and other energy supply opportunities in agriculture.

Energy Trends Through 2010

Turning first to the outlook through the end of 2010, I will be relying on EIA's *Short-Term Energy Outlook,* released March 10, 2009, which is updated each month.

Global Oil Markets. Following the sharp price decline that occurred during the second half of 2008, the global oil market has remained relatively stable since the beginning of the year. This situation is expected to continue through most of 2009, until economic recovery in the United States and elsewhere leads to a rebound in oil demand growth.

Crude Oil Prices. The future direction of world oil prices in the short-term will largely depend upon the timing and pace of the recovery of the global economy. The annual price of West Texas Intermediate (WTI) crude oil averaged $100 per barrel in 2008. The global economic slowdown is projected to reduce these prices, to an average of $42 per barrel in 2009 and $53 in 2010.

Motor Gasoline Prices. Gasoline prices have been slowly increasing over the last 2 months while crude oil prices have stabilized and refiner margins have recovered from their recent near-historic lows. After averaging $1.69 per gallon in December 2008, the lowest monthly average since February 2004, the retail gasoline price in February rose to $1.92 per gallon. Retail gasoline prices are projected to average $1.96 per gallon in 2009 and $2.18 per gallon in 2010.

Diesel Fuel and Heating Oil Prices. Retail diesel fuel prices in 2009 are projected to average $2.19 per gallon, down from $3.80 per gallon in 2008, while residential heating oil prices are projected to average $2.58 per gallon during the 2008–2009 winter season compared to $3.31 per gallon last winter. The projected decrease is consistent with lower crude oil prices and more than adequate levels of distillate fuel inventories. Total distillate inventories at the end of March 2009 are expected

to be 131 million barrels, up 23.5 million barrels from March 2008 and well above the normal range.

Natural Gas Production, Inventories, and Prices. Total U.S. marketed natural gas production is expected to remain flat in 2009 and then fall by 0.8 percent in 2010. Working natural gas inventories by the end of March are projected to reach 1,628 billion cubic feet, a level about 251 billion cubic feet above the previous 5 year average for March.

The Henry Hub spot price averaged $4.65 per thousand cubic feet in February, $0.75 per thousand cubic feet below the average spot price in January. Prices continue to reflect demand reductions brought about by the current economic downturn. As the year progresses, it is expected that average spot prices will remain near $4 per thousand cubic feet. On an annual basis, the Henry Hub spot price is expected to average about $4.67 per thousand cubic feet in 2009 and $5.87 per thousand cubic feet in 2010.

Electricity Consumption and Prices. An expected decline of 6.4 percent in industrial electricity sales during 2009 leads to a projected decline in total electricity consumption of 1.7 percent this year. Total electricity consumption is expected to grow by 1.2 percent in 2010 as a slowly improving economic climate contributes to a recovery in the sales of electricity. Despite the recent drop in generation fuel costs, some electric utilities have proposed slight rate increases in response to higher costs of securing credit for purchases of fuel and wholesale power, while other retail electricity distributors, especially in the West South Central region, have been able to pass the declining fuel costs on to customers through lower rates.

Ethanol. EIA projects that the market for ethanol will continue to grow, although much more slowly than seen over the past 2 years. In 2007, the ethanol industry produced an average of 425,000 barrels per day, providing about 4.6 percent of 2007 average daily gasoline consumption volume, or about three percent of the energy consumed by gasoline-fueled vehicles. Ethanol plants operated at or near their design capacity limit during this period. Ethanol production capacity increased by more than 50 percent in 2008 with production growing from an average of 492,000 barrels per day in December 2007 to an average of 656,000 barrels per day in December 2008. However, high gasoline prices and the weakening economy contributed to declining gasoline consumption compared with the year before. Ethanol production capacity grew faster than the demand for ethanol, and average ethanol capacity utilization rates fell from close to 100 percent at the beginning of 2008 to about 85 percent by the end of 2008. EIA's forecast for 2009 calls for continuing but very modest growth in ethanol consumption, with average capacity utilization rates falling to about 80 percent by the end of the year. Although farmers should continue to benefit from increasing corn demand, the availability of underutilized ethanol production capacity will tend to put downward pressure on the margin earned by ethanol producers over their variable production cost.

The projected slowdown in ethanol demand growth reflects the existence of several distinct segments in the fuel ethanol market, each with a different sensitivity to market price and infrastructure limitations. The reformulated gasoline market, which represents about ⅓ of the gasoline sold and is subject to the strictest environmental limits, is the least price-sensitive market segment for ethanol. Demand for ethanol in this type of gasoline, where it is used in blends of six to ten percent, increased significantly with the phase-out of methyl tertiary butyl ether (MTBE), which was completed in 2006. Since that time, virtually all reformulated gasoline has been blended using ethanol.

The next most attractive market segment for ethanol is as a volume extender for conventional gasoline in blends of ten percent. The high oil and gasoline prices last year, the availability of a 45¢ per gallon blenders' tax credit through 2010, and the "consumer illusion" that leads to choices between gasoline blended with and without low percentages of ethanol to be made purely on the basis of their price per gallon without consideration of the lower miles-per-gallon using fuel incorporating ethanol, all supported the growing use of ethanol as a volume extender in conventional gasoline. However, the recent fall in oil and gasoline prices has reduced the economic incentive for expanding ethanol blending capacity. While the current level of almost 140 billion gallons per year in national sales for all types of gasoline could, in theory, accommodate roughly 14 billion gallons of ethanol in blends of ten percent or less, many regions still lack the transportation and blending infrastructure to use ethanol. EIA's latest *Outlook* projects that 10.7 billion gallons of ethanol are blended into gasoline in 2009. We are aware of some other projections as much as 1 billion gallons per year lower, which would require the use of RINs (Renewable Identification Numbers) from prior years to comply with the renewable fuel standard established by the Energy Independence and Security Act of 2007 (EISA).

The final market segment for ethanol is use in high-percentage blends such as E85. Currently, high-percentage blends account for well under one percent of the overall U.S. market for fuel ethanol. Expanded use of high-percentage blends is necessary if total ethanol use is to grow beyond the level of 12 to 15 billion gallons per year that would saturate the market for low-percentage blends. Based on the Brazilian experience, consumers would generally expect high-percentage ethanol blends to be price-competitive with petroleum-based alternatives on an energy-content basis.

Energy Trends Through 2030

Turning now to the longer-term outlook, the discussion that follows relies on EIA's *Annual Energy Outlook 2009* (*AEO2009*) and on several recent EIA analyses of energy and environmental policy proposals that could have a significant impact on agriculture's role as an energy supply source.

Overview. Longer-term trends in energy supply and demand are affected by many factors that are difficult to predict, such as energy prices, U.S. economic growth, advances in technologies, changes in weather patterns, and future public policy decisions. It is clear, however, that energy markets are changing as they adapt to the significant volatility seen in recent years; higher energy prices since 2000 (notwithstanding the sharp fall in oil and natural gas prices since mid-2008); the greater influence of developing countries on worldwide energy requirements; recently enacted legislation and regulations in the United States; and changing public perceptions of issues related to the use of alternative fuels, emissions of air pollutants and greenhouse gases, and the acceptability of various energy technologies.

The *AEO2009* reference case projects an increase in the consumption of biofuels (ethanol, biodiesel and biomass-to-liquids fuels), even as consumption of petroleum-based fuels remains essentially flat, and an increase in other nonhydroelectric renewable energy sources, together with accelerated improvements in energy efficiency throughout the economy. The growth in biofuels and other nonhydroelectric renewable energy consumption leads to a gradual reduction in the role played by fossil fuels in meeting U.S. energy needs. The oil, coal, and natural gas share falls from providing 86 percent of total U.S. primary energy supply in 2006 to 79 percent in 2030, assuming no changes in existing laws and regulations.

Alternative Fuel Use. The use of non-petroleum liquid fuels is projected to increase substantially in the reference case as a result of the higher prices projected for traditional fuels and the support for alternative fuels provided in recently enacted Federal legislation, including EISA. Biofuels use grows in the *AEO2009* reference case from 7.3 billion ethanol-equivalent gallons in 2007 to 29.8 billion gallons in 2022 and 38.7 billion gallons in 2030. After 2022, the combination of the rising cost of petroleum-based fuels and steadily lower costs for biofuel technology results in the continued growth in biofuels consumption. The projected biofuels consumption in 2022 is less than the 36 billion gallons mandated in EISA largely because of the difficulties that we foresee in rapidly ramping up the production of cellulosic biofuels to the target levels set in that Act for the middle of the next decade. However, the targets for the use of 15 billion gallons of corn-based ethanol and not less than 1 billion gallons of biodiesel are projected to be achieved.

From a marketing perspective, biofuels that are substitutes for diesel fuel, such as biodiesel and biomass-to-liquids fuels, are expected to be blended into the same diesel supply as petroleum-based diesel. Ethanol use for gasoline blending grows to the 12–13 billion gallon level between 2022 and 2030, while E85 consumption grows from 11 to 17 billion gallons over that same time period.

The Effect of Lower Oil Prices. The crude oil price can be expected to have an effect on the longer term outlook for biofuels. In the *AEO2009*, the difference in crude oil prices between the reference and low oil price cases is almost $70 per barrel (2007 dollars) in 2022, and this price differential continues to grow through 2030. There is a pronounced lowering of cellulosic ethanol consumption in the low oil price case by 2030 due to the fact that it is not as price-competitive with petroleum gasoline, which results in a significant lowering of the total ethanol consumed by the end of the projection period: 20.6 billion gallons in 2030 in the low oil price case compared to 29.3 billion gallons in the reference case. Biomass-to-liquids production is also lower in the low oil price case than in the reference case.

Renewable Fuel Consumption and Supply. Total consumption of marketed renewable fuels in the *AEO2009* reference case, including ethanol blended with gasoline, is projected to grow from 6.7 quadrillion Btu in 2007 to 14.1 quadrillion Btu in 2030. The robust growth is a result of the nearly 30 state renewable portfolio standard programs, mandates, and goals for renewable electricity generation; technological advances; high petroleum and natural gas prices; and Federal tax credits, including

those in the Energy Policy Act of 2005 and the Energy Improvement and Extension Act of 2008.

Outlook Risks. As discussed previously, this longer-term outlook hinges upon the outcomes of a number of factors in addition to crude oil prices, which are not known with certainty. For biofuels the uncertainties include the actual implementation of the expanded renewable fuel standard in EISA, the continued difficulty second-generation biofuels technology developers are facing with financing and building projects in the United States and globally, and whether intermediate ethanol blends in gasoline above E10 levels will be allowed.

The Potential Impact of Possible Future Policies on Energy Supply From Agriculture

As previously noted, the *Annual Energy Outlook* reference case assumes that current laws and policies continue indefinitely. Other recent EIA analyses suggest that various policy proposals, including caps on greenhouse gas emissions, a renewable electricity standard for electricity sellers, or a low carbon fuel standard, could significantly increase reliance on biomass as an energy source. Agricultural products and residues, as well as dedicated energy crops, are a key part of the overall supply of biomass in some of our recent policy analyses.

The two main concerns that appear to motivate many recent policy proposals are energy security and reduction of greenhouse gas emissions. Our continuing policy analyses suggest that there are both synergies and conflicts between these objectives. For example, improvements in vehicle efficiency would advance both objectives. In contrast, the adoption of coal-to-liquids conversion without carbon capture and sequestration would advance energy security while increasing emissions.

The situation with respect to agriculture and biomass is somewhat complex. A policy focused on energy security would likely emphasize the use of biofuels to reduce our reliance on imported petroleum. Such a policy also would serve to reduce greenhouse gas emissions. However, if greenhouse gas emissions were the primary policy focus, biomass could be used as a substitute for coal-fired electricity generation to provide larger reductions in energy-related carbon dioxide emissions per unit of biomass energy used. While biomass from agriculture and other sources has an important role to play in either case, the way in which biomass is deployed will depend on how the objectives of energy security and emissions reduction are prioritized.

This concludes my statement, Mr. Chairman, and I will be happy to answer any questions you and the other Members may have.

The CHAIRMAN. Well, thank you very much. I appreciate that, and now we will go to questions.

I would like to remind the Members that they will be recognized for questions in order of seniority, for Members who were here at the start of the hearing, and after that, Members will be recognized in order of arrival. And I appreciate the understanding.

We will start off with, I just wonder if all of you would make some comment. The past couple of years, pork and beef producers in our state and across the country have borrowed against their equity, equity in land, to continue to operate. And, about the high cost inputs, and what has happened to the commodity price; I am wondering just how deep that can go. Where do you think we might be, and where that might be taking us, what the effects might be if that is so?

I'll start off with you, Dr. Glauber, whatever you might want to say, and the rest of you, please jump in.

Dr. GLAUBER. Well, there is no question that debt has been rising, and one measure, again, if you look at all of the aggregate measures for financial stability, that is, the debt relative to assets, as I mentioned, that at least in the aggregate, those remain pretty good.

However, there are other measures you can look at it. And you could look at debt relative to net income, and those certainly have been rising, and that is, of course, would be of some concern if your

debt servicing, the amount you have to pay, is large relative to the amount of income that you have coming in, in a given year.

But that said, I think that generally, again with the availability of credit, and again, the relatively strong financial position, that people are coming into with this downturn, that is one thing that sets agriculture apart from other sectors of the economy.

The CHAIRMAN. Thank you. Anybody else? Dr. Henderson?

Dr. HENDERSON. Yes. We have spent some time talking with the agricultural bankers over the last couple of years, and the mantra that they have been saying in these good times is remember the 1980s, and encouraging the farmers not to load up their farm operations with debt. And, I think I am going to agree with Dr. Glauber's comments if that the farm sector is able to maintain debt levels at relatively historically low rates, and that is going to be supportive of the farm sector going forward.

The CHAIRMAN. Okay, thank you. Dr. Gruenspecht. Well, I will recognize my Ranking Member for any questions he might have, and move us along.

Mr. MORAN. Mr. Chairman, thank you. Dr. Glauber, welcome to the Committee. You will be very important to us as we make policy decisions over a long period of time, and I appreciate your demonstrated expertise.

One of the conversations I had with your predecessor on numerous occasions, Dr. Collins, was about the definition of a *farm*. And I would again encourage the Department of Agriculture to change its definition for its economic analysis, because I think it so poorly reflects the reality. Statistics that you and the Department of Agriculture place to the public, and to us as policymakers, do not accurately or appropriately reflect the reality of agriculture, when you define a farmer in ways that, just a small amount of farm income causes somebody to be labeled as a farmer.

I would be happy to have your response. I have not been successful yet in getting USDA to change their position, but I do think it is important, as we try to analyze what is the right answer to many questions we face, plus I think it misleads the public in ways that are detrimental to producers.

Dr. GLAUBER. Well, thanks very much.

The concern, of course, is the fact that the definition of a *farm* is anyone that has grown $1,000 worth of farm produce, or could have grown $1,000 worth of produce. If you look at the increase in farms the Chairman alluded to in the Census, almost all of that increase is in that category of farms who grew $1,000 or less in the 2007 Census.

It remains the fact that the bulk of production is produced by those who are at the other end of that sales category. I mean, you understand the issues on number of farms, and there are a lot of funding things, of course, that we do in the appropriations that are determined by the number of farms, so I am at least a little aware of the politics of how that is defined. But it is true that the bulk of the farms are in this category of very small.

For farms reporting sales less than $250,000 class, that is where you see the majority of farms and their production, of course, they are important contributors to the total aggregate production, and

they are also, hold a lot of lands, so they are important from a conservation point of view, as well.

Mr. MORAN. Let me—I may come back to you, but you are no more forthcoming than Dr. Collins, so that—I take that—I mean that as a compliment.

Dr. Henderson, I am very impressed with the Kansas City Federal Reserve Board. I appreciate the activities that you all are engaged in, in regard to rural America. One of the conversations that I have had, with previous opportunities in visiting the Federal Reserve is that I think that the Fed—and again, I know that you are not the person, but you are my opportunity to speak about this—is that while the Fed has lowered interest rates, with the desired outcome of increasing economic activity, increasing borrowing, at the same time, the regulators have significantly reduced the willingness or ability of bankers across our, across your region, to be able to loan money.

To some degree, I think it is in agriculture. I have community and farm bankers tell me that the regulators will not allow them to make more farm loans, because they are too concentrated. But, it is also much more true in our more urban areas, where a real estate developer is not eligible, or the bank is incapable of making a loan to a real estate developer, because there are too many loans in real estate development.

And there is just this constant fear that what a regulator told a community banker, a small town banker, the last examination, is going to be something totally different than what that examiner is going to say during this examination. So, there is this great retrenchment in loaning money, and so, while we are making policy decisions designed to encourage the borrowing of money at low interest rates, the regulators are making decisions through examinations that are restricting the ability of banks to loan money to farmers and others across the country.

And I welcome your reaction or response to that.

Dr. HENDERSON. Thank you, and you are correct, in terms, I am outside the regulatory function at the Federal Reserve Bank of Kansas City.

We do, however, talk with each other, talk about the situations, and I have spent much time talking with regulators inside of our bank, but also throughout the country, talking about this issue. In general, the comments that I am hearing from them is, that they are asking the agricultural banks to think about their risk management profile, and how to manage the agricultural risk that is emerging in terms of your bank's portfolio, especially high loan concentrations. How do you manage that risk, and do you have a plan, systematic plan put in place to manage the volatile markets that are emerging in agriculture today?

Mr. MORAN. My time has expired. My final question, although I had one from, for our third panelist as well, but when will interest rates begin to rise?

Dr. HENDERSON. I assume that question is directed to me.

Mr. MORAN. It is. This is similar to the question that I refuse to answer, from my own constituents, is whether I should sell my wheat.

Dr. HENDERSON. This is one of those questions that are probably best answered by someone else in a different position than myself.

Mr. MORAN. You must have learned from Dr. Collins as well. Thank you, Mr. Chairman.

The CHAIRMAN. It is almost like a virus. Well, I would like to recognize the gentleman from Georgia, Mr. Marshall, for 5 minutes.

Mr. MARSHALL. Thank you, Mr. Chairman, and gentlemen, I apologize. I had to step out, had a meeting on missile defense. We are busy doing lots of different things up here, and many of us can't claim a great deal of expertise, certainly with regard to the issues that you all deal with daily.

I am regularly asked by folks in the poultry business, livestock business, and others, whether the production of biofuels is causing price increases in the inputs in those industries. And there are those who contend that it is, and it is a serious problem, and then, they will argue that in the long run, it poses a real threat globally. Projections are, at least, that arable land is going to decline, population will continue to increase. Consequently, yields must increase if we are to feed the globe, and that it doesn't do us much good globally to devote large swaths of our arable land to the production of energy, as opposed to production of food.

And so, you have Lester Brown and others out there who, even if we didn't add in the production of energy, say we are headed toward disaster. Then, you add the production of energy in, you have folks that I have known for a long time saying that this is causing them problems in their business. And I would ask our two non-financial experts, the ag experts, to comment on that.

Dr. GLAUBER. Well, no question that ethanol has caused, or the increase in ethanol production over the last few years has caused impacts on, particularly, corn and soybean markets, and those have radiated throughout the rest of the sector. One thing that I would point out is that under the Renewable Fuel Standard, because of the growth in that over the last few years, we saw sharp increases in ethanol production, certainly, particularly from 2006.

As we are looking out, however, that growth, the annual growth, begins to decline a bit. This year, for example, we are looking at about 3.7 billion bushels of corn being used for ethanol. And next year, we are projecting that to be closer to 4.1, and the following year, about 4.2, 4.3. So, you see those increases are smaller, and that will mean that the actual price effects should be less.

There is no question, though, with the rapid runup increasing corn grind by about a billion bushels.

Mr. MARSHALL. You are limiting your reference to corn, soybeans and other——

Dr. GLAUBER. Well, soybeans—no, soybeans. It certainly has an effect as well, because if, indeed, more corn is being grown for ethanol purposes, that means less area is going to soybeans, so that means price impact on soybeans, but also biodiesel, that has an important role, as well.

All I would say is that as we will begin to approach the 15 billion gallon cap, these increases are less sharp than they were, and over time, with moderation, or excuse me, with technological developments, we should see yields catch up with that, as it were. When we look out 10 years, we see the ending stocks, which is one meas-

ure of how tight those markets are, those begin to build again. As that increase in ethanol production slows, and the yield increases, which are modest, one percent per year, catch up.

Mr. MARSHALL. Sort of bottom line, once we get past the initial startup phase, you don't think that the devotion of a fair amount of our acreage toward the production of ethanol is going to cause problems for other producers?

Dr. GLAUBER. What I am saying is with average yields. Now, the problem, of course, is any given year, if you have a shortfall, then that comes in too, and that is one concern we would have, even now, with relatively tight supplies. I mean, we have more carryout than we thought we were going to have, say, in June of last year, but still, supplies are relatively tight, and if you were to have a big drought or a big production shortfall——

Mr. MARSHALL. Let me move, in the limited amount of time I have left——

Dr. GLAUBER. Sure.

Mr. MARSHALL.—to Dr. Gruenspecht, and just a little editorial comment before I begin. We ought to, in my opinion, add nuclear energy to the renewable fuels portfolio, so that certain parts of the country, the Southeast in particular, can meet the standards that people want to impose. But having said that, what is your comment about this competition, energy *versus* food for the use of land?

Dr. GRUENSPECHT. Clearly, any extra demand for renewable fuels inputs, that are based on land, is going to have some impact on the rest of the markets, but I would associate myself with Dr. Glauber's remarks. How that works through is going to depend on, ultimately, where the demand is going. It is going to depend on the yield improvements, and really all the factors that he identified. I think you would have to say it has some impact. How much and how important in the long term—I would defer to the ag experts on that.

Mr. MARSHALL. Thank you, Mr. Chairman.

The CHAIRMAN. You are welcome. I would just make this comment, and maybe our second panel will discuss it somewhat, but what we have done in increased production, Jim, over the last few years, is just remarkable. And I don't think we have tapped what the American farmer can do in production, really, as we continue to apply science to it. So, that is part of the consideration as well.

At this time, I would like to recognize for 5 minutes the gentleman from Missouri, Mr. Luetkemeyer.

Mr. LUETKEMEYER. Thank you, Mr. Chairman.

My first question will be to Dr. Henderson, just to like follow up on Mr. Moran's comment about the examinations. I have had a lot of discussion with a lot of folks in my district, including the Fed examined banks, with regards to what seems to be some overzealousness sometimes, with the examinations, inconsistencies of how they are looking at loans, and in doing that, discouraging credit.

Do you care to comment just for a quick second?

Dr. HENDERSON. Again, I just want to repeat that the examination function is outside the scope of my responsibilities. But in general, in terms of my conversations, and working with the examiners, in our district. The primary message that I have been hear-

ing from them as they talk to bankers in meetings, is put in place a risk management strategy. Agricultural risks in this environment are higher than what they have been the last couple years. Put your strategy in place, and manage that risk, going forward.

Mr. LUETKEMEYER. My only concern, and the message I would hope that you take back to your counterpart within your agency, is that there seems to be a disconnect between those people in the field and the management here in D.C., who oversee these things. Because I don't think that the message from what you are saying and what your counterpart is saying, and I have met with the FDIC folks as well, seems to be getting back to the folks in the field, from the standpoint that there is this disconnect and an inconsistency in how they are doing these examinations, which they need to be very concerned, obviously. I am not saying they shouldn't be, but I think that the level of inconsistency is such that it certainly gives great pause to those people who are making credit decisions, on what they should and should not be doing.

As a follow-up to that, I would just like your input with regards to what do you think of the FDIC proposal of 20 basis points assessment to all of the banks, to be able to continue the FDIC insurance fund? What kind of impact do you feel that is going to have on the farm economy and rural communities as a whole?

Dr. HENDERSON. In general, I do not have a personal opinion on the FDIC's assessment. What we have been hearing from our bankers, and what they have been telling us, is that the concern they have is that the assessment is going to reduce the amount of funds that they have for agricultural lending, rural lending, and various other types of lending out there, in terms of their community.

They are talking about it in terms of reducing their profits. That is going to have a dramatic impact, and then, that is going to reduce lending activity. So that is the assessment and the impacts that we are hearing about from our bankers, and the concerns that they are raising at this point in time.

Mr. LUETKEMEYER. Okay, when you say reduce, do you reduce it one percent, ten percent, 50 percent? Do you have a figure on it?

Dr. HENDERSON. No, we have not done any analysis or economic impacts to understand what type of reduction it would potentially have, or the types of impacts it would have on lending activity.

Mr. LUETKEMEYER. Okay. Thank you. Dr. Gruenspecht. I am very curious, how do you feel about the cap-and-trade systems being proposed, what kind of effect do you think that is going to have on the agricultural economy, in particular, on their input costs of fuel and fertilizer?

Dr. GRUENSPECHT. Well, I haven't read it yet. It just came out yesterday, but, we at EIA have done analyses of past cap-and-trade proposals and, generally, there is an impact on delivered energy prices and that would potentially affect things like fertilizer as well as energy commodities, but certainly, fertilizer, that has a very high content of natural gas.

Really, in terms of the economic impact on agriculture, I mean, for all these policy calls, it is a cliché, but the devil is really in the details. Agriculture, presumably, has some opportunities to be involved in carbon sequestration and other things, and a lot depends on exactly what the proposal is. It is hard to talk about proposals

in general, but one can say that in most proposals I have seen there would be an impact on energy prices, and that is certainly one part of the equation, affecting agriculture and other sectors.

Mr. LUETKEMEYER. Well, in all due respect, Dr. Gruenspecht, I have seen you before this Committee before in my short time here in Congress, and you already understand the realities of this situation. Can you give me an indication, just from the preliminary view of what is going on here, what kind of effect you would think it will have?

Dr. GRUENSPECHT. We really have not looked at the package. Frankly, in the package itself, from what I know about it, a lot of the key things, like the allocation of allowances are not even specified in the discussion draft. So, without even that level of detail, it is just very hard to reach a conclusion.

Mr. LUETKEMEYER. Thank you, Mr. Chairman.

The CHAIRMAN. Mr. Luetkemeyer, we will have the opportunity to invite the gentleman when we have opportunity, because we are going to all see lots more of that as we go down the trail.

Mr. LUETKEMEYER. I appreciate that. Thank you.

The CHAIRMAN. I appreciate your questioning. I would like to recognize for 5 minutes the gentleman from Indiana, Mr. Ellsworth.

Mr. ELLSWORTH. Thank you, Mr. Chairman. Thank you gentlemen for being here. I would like to concentrate my minutes on ethanol production. I can drive about 10 minutes from my house to a very beautiful ethanol plant that stopped mid-production, mid-construction, I should say. Another, not too far away, that stopped mid-production, we all had very high hopes, ribbon cuttings, and announcing jobs in our area, which we were all very proud of, only to see things shut down, with a lot of stainless steel and a lot of piping.

So, I guess my question to you is, if you could explore for me, and for the folks listening, just where your thoughts are on the future of ethanol, what do we need to do here in Washington? Is it going to be a big part of our energy future? You know, we are hearing a lot of chatter about raising the blend rate, how do you think that might affect ethanol. What are the impediments? I think, Dr. Gruenspecht, you had mentioned, in testimony, that you didn't think we were going to meet the Renewable Fuel Standards, and just explore into that a little bit. What we can go home and tell our folks about the future of ethanol, what we might be doing in that area. And maybe, Dr. Glauber, you may want to start, if that is——

Dr. GLAUBER. Well, let me just address the economics first. There is no question that, if you were to go back 18 months ago, these guys were getting great margins. And, the Chairman or someone mentioned, or maybe it was Chairman Peterson mentioned the fact that a lot of these plants were able to almost pay for themselves within their first 12 months or so of operation.

What has happened, of course, then, is that we have seen first, an increase in feed costs, so feedstock, that is, corn prices, rose to record levels, and in particular, if you were an ethanol producer and hadn't hedged those costs, you were hit very hard, and we know, certainly, of one company that ended up going bankrupt because of that.

Since that time, margins have been close to zero, and when I say margins, I am just talking about returns relative to variable costs. So, we are not talking about repaying capital and financing costs, which of course, over the long run, you will have to do that as well. However, they have improved a bit over the last few months. Certainly, most anticipate, as energy prices start to increase again, that you will see some profitability return to that industry.

We also know, however, that since about 2006, the price of corn has tracked fairly closely to the price of oil, so there, too, I don't think that anyone is expecting the sort of heydays, that you might have seen 18 months ago, return. I think there will be returns in there for the industry. The fact is the Renewable Fuel Standard creates demand for ethanol, and if you are a blender, you will need to buy ethanol, which means you will bid up the price sufficiently, so that someone makes a profit selling it.

But certainly, in the near term, particularly since we have a lot of credits from ethanol production that was previous to this, it wasn't, that was in excess of the Renewable Fuel Standard, the so-called RINs, they are being enabled to offset that, so we have excess capacity for the moment. But I expect, over the longer run, that we should be operating at close to capacity, as we move towards the 15 billion gallons towards the Renewable Fuel Standard.

Mr. ELLSWORTH. Thank you. Dr. Gruenspecht, do you have any comments?

Dr. GRUENSPECHT. You know, as Dr. Glauber said, oil prices matter and corn prices matter. There are really three segments of the market for fuel ethanol that Dr. Glauber was describing. It was really a must-have ingredient to make reformulated gasoline with the phase-out of MTBE, so that really propelled prices—people would pay whatever, it didn't really matter what you paid. And there was tight supply.

Then, there is the market segment we are in now, which it is sort of the volume extender. Sometimes, in internal discussions, we call it the Hamburger Helper type of thing, because it increases the volume. That is going to compete with gasoline on a volume basis, taking account of the tax credit difference. Right now, there is excess supply, so in fact the spot price of ethanol doesn't exceed the spot price of gasoline by the full extent of the tax credit, and that is an indicator that there is excess production capacity.

The final segment is the one where it competes on its fuel value basis. That is going to have to happen at some point if we are going to have a lot more ethanol. In the small volume blends, I don't think people notice the difference in energy content, but if you were buying a large volume blend of ethanol, you would definitely notice that a gallon doesn't get you as far as a gallon of competing fuels.

So, in the long run, that is a tough segment. The Renewable Fuel Standard program, obviously, what happens there matters a lot. You mentioned my testimony. Where we think things will fall short is on the cellulosic side. Actually, in the provisions that were enacted, there is a provision that calls for modification of amounts. The whole 36 billion gallons is sort of a series of nested sub-targets, almost like a set of Russian dolls, and each of them has to be met, and if they are not met, if there is a 20 percent or larger shortfall in any one of the targets, there is a required rulemaking

to modify the amounts. We actually think the cellulosic ethanol is not coming along as fast as the targets in that bill had anticipated.

The other issue that has to be dealt with, I think you mentioned, is what you might call the blend wall issue. I think I am past my time, so I should probably stop, but there is a lot going on in this market.

Mr. ELLSWORTH. Thank you. We will revisit it.

Dr. GRUENSPECHT. Thank you. I appreciate it.

The CHAIRMAN. You are welcome. The chair recognizes, for 5 minutes, Mr. Schrader from Oregon. Mr. Schrader.

Mr. SCHRADER. Thank you, Mr. Chairman.

We have had pretty good testimony on the state of American agriculture. I am curious how the rest of the world is doing in this global economy and meltdown. And I noticed from the one of the charts from one of you that there, our imports are still up, even though our exports are down, and wonder if you could comment, any of you gentlemen, on that.

Dr. GLAUBER. Yes, you're right. Imports are up, and they have been pretty steady, I would say, over the last 10 or 15 years, in terms of the growth in imports. You asked about conditions worldwide. Certainly, there are serious credit problems that many countries are experiencing. The former Soviet Union countries, Russia in particular, there are indications that there are credit problems there for financing production. There have been press reports of problems in Brazil. The question is whether those get sorted out by the time people are making planting decisions. We aren't foreseeing great drops in productions, all that said, but certainly, there are countries that are experiencing difficulties. There are still countries that are experiencing very high food prices. Some of that is due to the fact that they can't get exports into those countries.

There is financing problems with credit. I think the World Bank just made an announcement that they are going to try to address that issue by making some funds available for credit for the purpose of sales, but the financial situation is quite difficult for a number of countries worldwide.

Mr. SCHRADER. Just as a follow-up. Are there things that we should be doing to assist American farmers to be in the best position as this economy turns around, to compete and improve our exports?

Dr. GLAUBER. Well, a couple of things: We are looking at lower exports this year, but there are some bright spots. I mean, China continues to import soybeans at very high levels, and of course, we are very interested in looking at what happens to China, in terms of their economy. Because hopefully, that will continue, that they will continue to eat meat. They will continue to import protein meal and other grains.

The other issue is, just in general, of course, the currency values. Over the last couple of years, the dollar was relatively weak, and so, it was not only cheap to import U.S. goods, we did well *vis à vis* some of our competitors. The dollar, of course, has appreciated over the last few months, and so, that has had some effect on our exports as well.

Mr. SCHRADER. Dr. Gruenspecht, in my neck of the woods, we are very interested in biomass and the cellulosic opportunities. You in-

dicated that we are not meeting targets, and there are some problems. Could you elaborate a little bit on that, and also, in your testimony, you talked about the complex relationship with our energy policy, possibly. Could you elaborate?

Dr. GRUENSPECHT. Sure. The Energy Independence and Security Act of 2007 sets up this 36 billion gallon target, and it is divided into different categories, and one of the categories is cellulosic ethanol. We follow pretty closely what is going on in the industry and when plants might actually be constructed at various scales, and there is some talk about constructing some plants at a 20 million gallon a year type scale, which is a pretty significant scale, but small relative to a full-scale corn ethanol plant—but definitely more than a demonstration.

The expectation is, the first of those simply aren't going to be coming online until 2011, 2012 timeframe, and then, I don't have the number in my head, but for 2016, the target is 4.3 billion gallons of cellulosic ethanol for many of the issues we have a good vision of there, and we know where here is, and the question is can you get from here to there, and it just doesn't seem likely. I think a lot of people will be looking at these first plants that get built and they won't quite be ready to go into mass production, in terms of building large numbers of those plants. I think the thought is they will learn things from the initial plants, and it will take some time for the standard type of plant to be developed, and, then, it will take time for that plant to be built. It is more complex than a corn ethanol plant.

So, all those things lead us to believe, and the first Administrator of EIA said there are no facts about the future, and that is true. It is the future. We don't know, but it seems unlikely to us that you would get to those type of levels by 2015, 2016. In terms of the interaction with other areas, biomass can, and already is used significantly to generate electricity. It is used to generate electricity and provide energy in the pulp and paper industry, among others. Also, it is used outside the paper and pulp industry, in some particular areas—in the South, in Maine, for instance. The Southeast is very rich in biomass, and there is potential to use the biomass either for electricity generation, or as a feedstock for liquid biofuels.

Liquid biofuels could be something other than ethanol. In fact, in our projections, we tend to think that there will be compelling reasons to make something we call BTL, biomass-to-liquids. There already is technology, the Fischer-Tropsch technology, to make coal into liquids, or gas into liquids, and the liquids you get out of that are diesel, and diesel has a lot of advantages, potentially, relative to ethanol, in terms of its market value, and in terms of its ability to go directly into the stream of commerce.

So, again, we think there will be some of that, but there is also an opportunity to make electricity, depending, in part, on what Congress does. The energy and climate change bill that was floated yesterday has what is called a Renewable Electricity Standard. Certainly, one way to go toward meeting that standard would be to use biomass to generate electricity.

As I said in my testimony, a lot of it comes down to policy calls, which my organization certainly doesn't make, on how you

prioritize what I would call the two major energy-related concerns, which are energy security and greenhouse gas emission reduction.

So, hopefully, that is an answer to your question.

Mr. ELLSWORTH. Thank you very much. I yield my time, sir.

The CHAIRMAN. Thank you. The chair recognizes the lady from South Dakota, Ms. Herseth Sandlin.

Ms. HERSETH SANDLIN. Thank you very much, Mr. Chairman, and thank you for having this hearing. My questions will follow up on Mr. Ellsworth and Mr. Schrader's questions about the ethanol industry, as well as a question for Mr. Henderson on the credit issues facing young and beginning farmers.

But let me first make a few comments for the record with regard to my colleague, my friend from Georgia, Mr. Marshall, with regard to this fuel *versus* feed issue. Certainly, we heard from our witnesses and from the Chairman the extraordinary advances that we are seeing in feed technology, that have vastly improved the yields over the years of corn and other commodities, but we know that there is more to come in that area, to be able to meet the needs for fuel, feed, and food.

But I would contend that the overall health of the farm economy has benefited in years past, and will continue to benefit in years ahead, when you have competition for commodities. And unfortunately for some in the poultry industry, and some in livestock quarters of the industry, that have been vastly vertically integrated, they benefited for years, before the ethanol industry developed, from cheap corn, *i.e.,* taxpayer-subsidized corn, that was sold on the market for less than the cost of production. And now, they are feeling the effects of the fact that corn farmers are getting a fair price for their commodity. And so, yes, they are being squeezed, but at the same time, with the feed technology advancements, with the dry distillers' grain, and other research going on in that area, we would hope that we could find the partnership necessary, rather than what we saw. Some, regrettably, joined forces with the Grocery Manufacturers Association, in their public misinformation campaign at the beginning of last year. We hope they understand the partnership that is going to be necessary between livestock producers and grain producers, going ahead to ensure competition for all of their commodities.

Dr. Gruenspecht, the blend wall issue, you were going to, if you had had time get to that, in Mr. Ellsworth's question.

Has EIA studied the economic effect for the ethanol industry of allowing an E15 blend, or even the interim step of an E12 or E13 blend?

Dr. GRUENSPECHT. We have not looked at that. As I am sure you are aware, this is an issue that is the subject of a petition that has been filed with EPA. There are a lot of statutory issues. Other parts of the Department of Energy, I know, are involved in testing of the compatibility of existing infrastructure and vehicles, and various other types of engines, with different blends. But EIA itself has not looked at it. From our perspective, to evaluate it would be a pretty mechanical thing. We know how much gasoline is projected to be used. You can figure out what a ten percent blend of ethanol means and, obviously, a higher percentage mixture of ethanol would accommodate more ethanol.

There really are four ways of dealing with a blend wall. There are three ways over it, and one is E85 and flexible fuel vehicles. One is other biofuels, and the other one is sort of mid-level blends, which is what you are raising. And the way around it is to use the waiver authority. So, it has good policy options.

Ms. HERSETH SANDLIN. Okay. Well, I am running out of time.

Dr. GRUENSPECHT. I am sorry.

Ms. HERSETH SANDLIN. Let me also—given Dr. Glauber's testimony about how, currently, there is excess capacity. That is why many of us are looking at this blend wall issue as the way to maintain an industry that is necessary to get to cellulosic biofuels, sort of as the bridge to get there to meet these requirements set forth in the Renewable Fuel Standard.

So, do you agree that there is a nexus, with the credit crunch that the ethanol plants have been facing, the issue of gaining better, greater percentage of the market, as it relates to the blend wall issue, and being able to then meet the out-year targets in the Renewable Fuel Standard for cellulosic ethanol?

Dr. GRUENSPECHT. I am not sure I fully understand the question. I think the immediate thing that we see with the cellulosic ethanol is that it is just not, in our view, and this is the future so we don't know for a fact, but it is not likely that we will have the levels for 2015 and 2016 and 2017 that are there in the standard. I don't know that that is tied specifically to the situation now with corn ethanol.

It may be tied somewhat to the situation with the overall economy and the availability of credit.

Ms. HERSETH SANDLIN. With the Chairman's indulgence, if I could rephrase it another way. If we are currently faced with excess capacity in the corn ethanol, then where will the market be for cellulosic ethanol? And that is the issue that I think some out in financing are asking. And so I do think, in my opinion, there is a nexus between the tools available to us as policymakers and, hopefully, the approval of the waiver application at the EPA for a higher blend, as well as getting over the barriers on infrastructure for E85 and flex fuel vehicles. We can't move the research and development and the deployment to get to commercial production of cellulosic biofuels if we are facing these current issues of excess capacity and the market available for corn ethanol. The incentives won't be there. So, I guess I maybe didn't phrase it as artfully the first time, but I will submit for the record my question for Dr. Henderson, as it relates to the particular impact of the current credit crunch on young and beginning farmers, and how some of the provisions, the loan guarantees and other programs that we authorize in the farm bill are affecting——

The CHAIRMAN. This is very important, and maybe you would like to, you want to try and answer her question?

Ms. HERSETH SANDLIN. Well, if—I know we have other Members here who have been waiting, but it is just—in terms of overseeing the implementation of the new farm bill, have some of those new programs been specifically included for young and beginning farmers? Are they being utilized, or are they being helpful in addressing what is happening to some of the smaller farming operations that tend to be young and beginning farmers?

Dr. HENDERSON. In general, my colleagues at the Kansas City Fed, in conjunction with the USDA economists, have done some recent research, and it has recently been published, upon denials of credit. What they have been finding is that smaller farm operations, and those operations owned by younger farmers with less experience, are more likely to be denied credit.

So now, going forward, I think the implications become, what are the roles of these programs, are they utilizing these programs? Are these programs being utilized at the Federal level? Various different states have their own small and beginning farmer programs. We have not really conducted any thorough analysis on that at this point in time, but it is something that we will be looking at, going forward.

Ms. HERSETH SANDLIN. Thank you. Thank you very much.

The CHAIRMAN. Thank you. The chair at this time would like to recognize Ms. Markey from Colorado, 5 minutes, please.

Ms. MARKEY. Yes, thank you, Mr. Chairman, for holding this hearing, and thank you, panel members.

I want to switch gears just a little bit, and talk about natural gas, which is important to my district in eastern Colorado. Mr. Gruenspecht, you mentioned that natural gas production is likely to fall in 2010. Can you give me, and give us an estimate, of what percent of this country's natural gas production is for agricultural purposes, as opposed to, let us say, electricity generation for residential use? And then, second, are trends showing more, less, or stable competition against agriculture for each cubic foot of natural gas?

Dr. GRUENSPECHT. I probably don't have the numbers for your first question right at hand. I think that the industrial sector, as a whole, is a very big user of natural gas. I think agriculture is a relatively small piece of that. There is electricity generation, and, then, there is heating in residential and commercial buildings. But I will get you the exact numbers you want for the record.

I am sorry, I have forgotten a little bit about the rest of the question.

Ms. MARKEY. And, as natural gas production decreases, how do you think agriculture fares against residential use? Do you think that the percentage——

Dr. GRUENSPECHT. Well, natural gas prices this year or next year we expect to be a lot lower than they were in 2008. Natural gas prices have come down a lot, in part because non-agricultural industrial demand has been significantly affected by the economic conditions, and, in fact, natural gas production domestically has been a great success story, really increasing dramatically from unconventional sources of gas, in gas shales and in tar sands. Some of your neighboring states, have a lot of tar sands gas production. Colorado has pretty significant natural gas production as well, and it has been a strong market and reserves are increasing.

But the issue now is that prices have fallen with, really, the decline in industrial demand, which has been affected by the economy, and that, in turn, has led to a reduction in the number of drilling rigs in use, as the industry looks at what the near term opportunities are to sell gas. Some of the gas projects can generate production in a relatively short period of time. It is not like the off-

shore oil projects, where the investments you make today don't begin to pay off for 6 or 8 years.

So, producers looking at the economy and the demand for natural gas, and the current prices, which have fallen a lot, have responded by backing off a little bit on their production. So, it is really a situation of lower demand that has driven the decline in production and presumably, if the economy would recover, demand would increase, and one might expect to see more natural gas production.

But, generally, I would think that this year, 2009, because of those conditions, is really sort of a buyer's market for natural gas. So, to the extent that agriculture is one of the buying sectors, they are going to be seeing pretty attractive prices.

Ms. MARKEY. All right. Well, thank you. I would appreciate that information. Thank you, Mr. Chairman. I yield back.

The CHAIRMAN. Well, thank you. The chair at this time would like to welcome back Mr. Pomeroy from flooded North Dakota. We feel a lot of concern about what is going on with our good friends up there. And welcome back. I am sure you have some things to share with us, but I would like to recognize you to question the panel for 5 minutes.

Mr. POMEROY. Thank you very much, Mr. Chairman. Thank you for your concern, and the concern other Members have expressed. I am happy to report the water in the Red River continues to go down, and it looks like this heroic community-wide effort put forward by Fargo, in putting 43 miles of temporary dike in place, will have largely saved the city. There will be some number of residences lost outside city limits, but just an extraordinary achievement. It was thrilling to be out there and to be a part of it. Although we have to make sure we get some permanent flood protection in place, so we don't live with this Sword of Damocles hanging over our head.

A couple quick questions about CRP. CRP leases expiring in upcoming years, literally millions of acres enrolled that will be expiring. What do you anticipate happening? Just run across the panel on that.

Dr. GLAUBER. Well, you are right. You know, the farm bill, of course, limits enrollment to 32 million acres by the end of this year, starting October 1, 2009. There is currently 33.7 million acres enrolled. I believe at the end of this year, we have some 3.9 million acres that are on contracts that are set to expire, and I think if you, when you run through the eligible acres, that is essentially 1.4 million acres. Most of that land is located in the plains, in essentially land that is susceptible to wind erosion. There are some wildlife benefits, as well, in those lands, but we are talking land, essentially, that would potentially go into wheat, as opposed to, say, land further east, where you might see more into soybeans or corn.

Mr. POMEROY. So, you see a fairly seamless way the acreage coming out hits our farm bill target?

Dr. GLAUBER. Yes, the, I mean, there is a slug of land that is coming out this year, and that is the critical thing. And when you were debating the farm bill, and looking at getting to 32 million acres, that was taken into account, knowing that it would be able to reach that.

Mr. POMEROY. Do you believe we will hold in at about 32 million acres, or do you think——

Dr. GLAUBER. Well, again, a lot depends on what happens with this 1.4 million acres.

Mr. POMEROY. In the years ahead, do you see the——

Dr. GLAUBER. What—yes——

Mr. POMEROY.—that land coming back into production, and going well below 32 million acres?

Dr. GLAUBER. Well, I think a lot depends on prices. There is some land that would remain long-term in enrollment, and some land that, in particular, where the environmental benefits are so high that a lot of people are going to want to keep that land in reserve status.

The issue is, well, is there a class of land that is fairly productive, that the environmental benefits are less than these more environmentally sensitive lands, whether that will come in. And I think a lot will depend on prices.

By and large, though, if we were looking at our baseline, we are looking at CRP levels close to the 32 million acres.

Mr. POMEROY. I would ask that one across the panel, but in light of rapidly diminishing time, let me move to my second one, and it concerns the cost of fertilizer. What will happen now that energy prices have come down? Are we going to see substantially better buys on fertilizer, and how does that relate to the net income position for the farmers?

Dr. GLAUBER. Yes, if you look at the wholesale prices, they dropped fairly quickly in the fall, and plummeted. At the retail level, as you are well aware, a lot of these prices held strong. In fact, as we were looking at, when we were doing our outlook projections, for the outlook conference, and that is one reason why you saw estimates for corn acreage all over the map prior to those prospective plantings coming out.

Just, for example, at the end of November, anhydrous was selling, and this is data from the AMS reports out of Illinois, for which there is variation in pricing, region to region, town to town, has varied a lot. But just to show you, the anhydrous prices are down probably 35 percent from where they had been at the end of November. Same with urea, down about 40 percent. DAP prices have been down 50 percent. So, they have come down, but they only have really come down over the last month or so, 6 weeks, and so, as you are trying to figure out what farmers are going to do, in terms of making their planting decisions, more importantly, what, as they try to figure out what to do, a lot depends on what the—a lot of the pricing decisions on inputs was put off later this year, than it had been in previous years.

Mr. POMEROY. You are seeing localized variations at the retail level. The wholesale prices come down, but basically, farmers might well be advised, then, to shop closely on this one. They might be able to find better——

Dr. GLAUBER. I think that is true. You know, a lot of things have, with the late harvest, there wasn't a lot of field work. So, I think that, in some areas—there were delays anyway—but with the pricing, with the input prices so high, if you priced your, if you bought those inputs last fall, you are looking at pretty tough margins. If

you were able to take advantage of the price drops over the last 2 months, you are in a little better position.

Mr. POMEROY. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you. We are going to dismiss the panel, but just before we do, I want to thank you very much for your time. We are going having to call again, I am sure, from time to time, so you will be hearing from us.

Just kind of a parting shot, though, to Mr. Gruenspecht. Ms. Herseth Sandlin kind of triggered my thoughts on that, I realize that the oil industry has got a big investment and so on, but it just seems to me like we ought to be able to figure out some way to get some of this alternative product to the places that can use it. And I won't ask you to speak to it now, because of the time, but I would like to engage in conversation. Ms. Taylor will beat you wherever you go, and maybe we can sit down and visit sometime.

So, thank you very much. We are going to excuse the panel. We appreciate it, and ask the second panel to come to the table. Thank you.

Well, I thank the new panel, too, for your patience in waiting, and we will try to move along. I am going to ask my colleagues to help me on some of the introductions here, but we will start off with recognizing Dr. Harl, I have known for a long, long time. I don't know if we want to reveal that or not, just as an interest, when he went off to the college and university, I went off to the Army, and we met again in the farm crisis, when I came back and took up agriculture. I attended a lot of your meetings, and got to respect and admire Dr. Harl very much for his expertise, and drove a lot of miles at different times to hear what you had to say, and try to put it into practice. And I appreciate what you have done, and your accomplishment as the Charles Curtiss Distinguished Professor in Agriculture and your emeritus position as Professor of Economics. And you have a law degree, and many other accomplishments. So, the list is long, and we welcome you to the panel.

And I would like to, at this time, recognize Mr. Moran to make the next introduction.

Mr. MORAN. Mr. Chairman, thank you. I, too, welcome Dr. Harl back to our Committee, to our Subcommittee.

Next to him is Mr. Dumler, who is with the Kansas State University Extension Service. He is an extension economist, and we are delighted to have him back. Mr. Dumler has testified here before, and I am very pleased that he has joined us. He comes from Garden City, Kansas, where we had 16 to 20 inches of snow over the weekend, and——

The CHAIRMAN. Doesn't sound like a garden to me.

Mr. MORAN. He is—well, it is very much a garden, assuming that it stayed on the fields and didn't blow away. It was very important and necessary. Mr. Dumler is very thoughtful, and I appreciate his testimony. He is perhaps less flamboyant than who is usually seated next to Dr. Harl, Dr. Flinchbaugh, and while today we may miss out on the antics of the two professors, we are delighted to have Mr. Dumler here instead of, well, I shouldn't say it quite that way, we are delighted to have Mr. Dumler, thank you very much.

The CHAIRMAN. I would like to recognize Mr. Marshall for an introduction.

Mr. MARSHALL. Thank you, Mr. Chairman. Scott Angle is Dean and Director of the College of Agricultural and Environmental Sciences at the University of Georgia, and we are just delighted to have him as our Dean. He is very well known in farming circles throughout Georgia. He is very good about outreach, and getting around the state, and meeting with folks, and runs a very, very important program to all farmers in the Georgia area. He has access to staff and faculty that have true expertise with regard to economic conditions throughout the Southeast, where farming is concerned.

Scott is very, very extensively published, and has had a distinguished career as an academician in farming, but he also happens to be a farmer, and he might have the longest commute in the country. His farm is in Maryland, and he serves in Athens, Georgia. So, we are very pleased to have you with us, sir.

The CHAIRMAN. Well, thank you, and Mr. Costa got called away, so we will have to stand in for him to introduce Dr. Mickey Paggi. He is Director of the Center for Agricultural Business and Adjunct Professor, Department of Agricultural Economics, California State University at Fresno.

We welcome all of you to the panel, and at this time, we would like to recognize Dr. Harl for this remarks.

STATEMENT OF NEIL E. HARL, PH.D., CHARLES F. CURTISS DISTINGUISHED PROFESSOR IN AGRICULTURE AND EMERITUS PROFESSOR OF ECONOMICS, IOWA STATE UNIVERSITY, AMES, IA

Dr. HARL. Thank you very much, Mr. Chairman, and Members of the Committee. It is a pleasure to be testifying before the Subcommittee. I am pleased to be back in room 1300. I might add, parenthetically, the first time I have had an opportunity to thank Congressman Moran for his kindness the last time I was here and apologize for leaving in the middle of my testimony, but I had to catch a plane. You may recall that, July 30, 1998. So, I apologize for that, Congressman Moran.

Let me say that I want to try to avoid duplication of comments from the earlier panel. We are all trying to cover some of the same material, so I will hit the high points, and leave it to the questioning to draw out any additional details which you might be interested in.

This is a very grim time for the country. My first recollection of life is of a hot July afternoon in 1936. I was not quite 3, looking out the window of my dad's rental home, rented farm home, which was in foreclosure, I found out later. And out in front, a strange sight, about 20 men in, with round point shovels widening the road. My mother later told me that I asked who those guys were, and she said well, it is a new Federal program. It is, she said WPA, I might have that wrong, but she said that, it is close at least. We are quite a way from that. I can recall from that time forward living on a farm, and how we coped with the Great Depression. And this downturn has been compared, excuse me, to the greatest downturn since the Great Depression.

And I want to stress this morning that the agriculture sector is not an economic island. The global financial difficulties that have

caused a lot of heartburn for financial firms and most of the global economy have so far largely bypassed the agricultural sector. Now, I do see some warning signs, some danger signals, and I want to identify those in just a couple of moments. It is clear, though, to me, that if the meltdown persists, and the longer it persists, the more serious and far-reaching the effects are likely to be on farming, on rural areas, and on ranching.

If investor confidence is not soon restored, credit availability could eventually pose a significant problem. The worldwide demand for agricultural products would likely decline, and we know, of course, already, rural areas have suffered layoffs, with rising unemployment, stock market losses, they have lost their 401(k)s as well as other areas. So, we need to separate rural areas, to a degree, from farming, because farming has done relatively better, because primarily of better commodity prices, and also, reduced discretionary spending in rural areas.

Budgetary problems at the state level and at the county level are serious in much of rural America in the current year. These effects seem likely to continue for the next several quarters, and in some instances, beyond. Crop farming has fared better than livestock farming in recent months, but there are storm signals that are flying.

Now, in my view, the major unknown is how long this downturn is likely to continue. And let me offer just a couple of thoughts on that point, because I have been working on this off and on for a little over a year. My biggest concern since last summer has been that the global meltdown that we are experiencing has not displayed the features of a normal economic decline. Usually, when we have had a decline over the last 80 years, since the Great Depression, or 70 years, we would see a sharp drop, usually a fairly prompt recovery, and in somewhere between 18 months and 2 or 3 years, we had pretty well forgotten about it, except maybe the one in the mid-1970s and the one in the early 1980s. But generally that was the case.

But the drop in economic activity that began in late 2007 appears to be more of a downshifting of the economy. Now, with due regard to *TIME* magazine, the current issue cover story is about pressing the restart button. I don't really view it as a restart situation, because that connotes that all at once, we manage to restore operations, restore the economy at about the level it was. I don't believe that is the case here, because I think what we are dealing with is a revolutionary shift in thinking about debt, the likely result of companies curtailing the high use, the high levels of debt, the corralling of patently unwise strategies employed on a widespread basis to deal with debt. A revolutionary shift by consumers about debt.

So, what we are doing is trying to eat, if you will, to consume debt, and either we can do it as consumers and companies, or we can offload it onto government, and so far, we seem to be doing more of the latter. But however it is done, it is going to cause a longer term problem for us, for the economy. Consumers, companies, governments have all been living beyond their means, and we have been doing it heavily with debt capital. That bubble has now burst, and adjustments are going to take quite a while.

And so, that is why I started off my testimony by saying the longer this continues, the more serious it is for the agricultural sector. And my concern is that it may last longer than we anticipate. Although I have been watching carefully, the stimulus effects, the stimulus programs, and I hope that we can accomplish a great deal with those. But, I warn that we have incurred, and are going through a massive shift in thinking, about debt, and that is going to take a while to work through. Now, I said that the agriculture sector is not an economic island, but let me mention that we seem today to have missed the worst of it. I just don't think it is going to continue to miss it, if we don't get an upturn soon.

A word or two about ethanol production. That was discussed by the prior panel, and in a number of the questions. The boost in commodity prices is heavily related to the growth of the ethanol industry. The demand of ethanol plants for corn caused a drop in prices for other commodities, soybeans, and to a degree, wheat as well. As early as 2009, we had about 170 plants in production, representing roughly 4 billion bushels of demand for corn. More than 20 have filed for bankruptcy. We have somewhere around 12 percent of the capacity that is idled, and some estimates run as high as 30 percent, if you factor in also the amount of production that is on slowdown.

So, there are two brakes dealing with ethanol. One is the brake that comes from prosperity in the ethanol, raising the price of corn because demand goes up, and that, of course, reduces profitability for the ethanol plant, because they have to pay more for their raw material that makes somewhere, 60, 70, 80 percent of their input cost. Also, the second brake is the relationship to the price of crude, and as we have seen this so very clearly in the last year, the ride up was a lot of fun. The ride back down again wasn't so much fun.

So, we have two brakes here that are of concern. What about ethanol plants that are now shuttered, or cannot cover their variable costs? Some are likely to be sold at a discount. In fact, that is going on almost as we speak. A government credit line would help to buy time, but it is not a viable long term solution. In the long term, ethanol must be a competitive source of energy to survive, unless subsidies continue, mandates increase, and tariffs are maintained.

I think we are going to see, going forward, with a huge amount of economic incentive for alternative energies, we are going to see a lot of emphasis on new possibilities, and there is a lengthy list of them. I think that what we need to realize is that the economics of it are eventually going to have a lot to say about the role of ethanol. I think it will be with us for a while, but I don't think it is going to be the dominant source of energy.

I would like to say a word or two about the impact worldwide on the demand for food and fiber. The World Trade Organization, about a week ago, indicated about a nine percent decline in world trade expected in 2009. That is an awesome decline in economic activity, and of course, the reverse of that has been that we saw the buildup of per capita incomes in a lot of third world countries, as jobs moved overseas, as outsourcing occurred, globalization took place. And it was a success story, helping to solve world hunger problems in places like Bangladesh and India, China, and elsewhere. Now, we are seeing the beginning, maybe, of the reverse of

that, where our lessened demand for labor intensive products is causing problems of unemployment in those very areas, and that can lead, because of the very high income elasticity of demand in those countries, can lead to a decline in the demand for agricultural products. So, one of the more important and enduring components of our increase in demand in recent years has been the growth of third world incomes, and that could be at risk if, again, the downturn and the global meltdown continues.

A word about signs of tightening credit. I have been looking at the FDIC data from the end of 2008 compared to 2007, 2006, an increase to about seven percent in Iowa banks that were unprofitable, compared to 4.3 percent a year earlier, and 2.87 percent a year before that. I just picked up a copy of the annual report of one of our banks in Ames, and their income dropped by half last year, and a lot of it was because of their investments in Fannie Mae and Freddie Mac, which was a very common and believed to be very secure investment. That is biting a lot of banks that are in the coastal group of banks that are getting assistance, but it is part of the problem that they face.

So, to close my comments, the economic state of the sector depends heavily on whether the world economy continues to decline. If confidence is not restored, and the financial systems continue to deteriorate, the agricultural sector will likely suffer the effects on a widespread basis. I think the non-farming part of the agricultural sector, of the rural sector, is already feeling many of those effects. I think it will eventually embrace even the farming side. We have seen a sharp drop in commodity prices, notwithstanding yesterday's increase, spike up, because of the reports from the USDA.

So, the success of the stimulus packages, the efforts to stabilize the finance institutions, are vitally important to the agricultural sector. It is just that I have also concerns about how we really ought to be addressing this very unusual downturn period in our economy, when it doesn't seem to be the normal type. It seems to be based on the fact that we have to deal with a huge amount of debt, either as individuals, companies, or as governments, and that is a decision for a higher pay grade than I have, and some question for down the street as well.

So, thank you so very much for the opportunity to be here.

[The prepared statement of Dr. Harl follows:]

PREPARED STATEMENT OF NEIL E. HARL, PH.D., CHARLES F. CURTISS DISTINGUISHED PROFESSOR IN AGRICULTURE AND EMERITUS PROFESSOR OF ECONOMICS, IOWA STATE UNIVERSITY, AMES, IA

Although I endeavor to be objective in my testimony, in the interests of full disclosure, I should note for the Subcommittee that my wife and I through an entity, Harl Farms, LLC, own farmland in Iowa which is operated under livestock-share and crop-share leases. I am in emeritus status from Iowa State University and continue to be engaged in writing, publishing and consulting. I do not believe that my testimony is affected in the slightest by any of those activities, however.

I. Introduction

The agricultural sector is not an economic island. However, the global financial difficulties that have caused severe heartburn for financial firms and most of the global economy have largely bypassed the agricultural sector. It is clear that the longer the meltdown persists *the more serious and far-reaching the effects are likely to be on farming and ranching and on rural areas.* If investor confidence is not soon restored, credit availability could pose a significant problem for production credit,

land purchases and trade in agricultural products and the worldwide demand for agricultural products would likely decline further. Moreover, rural areas have suffered lay-offs with rising unemployment, stock market losses and reduced discretionary spending in addition to the long-term adjustments that have been on-going for decades. These effects seem likely to continue for the next several quarters and, in some instances, beyond. Farming, particularly crop farming, has fared relatively better than livestock farming in recent months but storm signals are flying for crop production.

II. The Danger Signals

Higher commodity prices in 2007 and 2008 and modest debt levels (compared to the 1980s era) have helped the farming sector in many areas of the country avoid the worst effects of the global meltdown and have enabled agricultural lenders, in general, to maintain healthy balance sheets. But the sharp declines in commodity prices in late 2008, the economic and financial woes of the ethanol industry and the falling demand for agricultural products, especially in developing countries, are impacting the sector to a much greater extent in 2009.

Commodity demand and supply

When corn prices were hovering near $8 per bushel, soybeans were selling at more than $15 per bushel and wheat had skyrocketed to near $25 per bushel in some specialty wheat markets, optimism was justified for those who believed that such price levels would continue. An unprecedented amount of net income was bid into cash rents and capitalized into land values. But with corn dropping to the vicinity of $4 per bushel, soybeans in the $9 to $10 per bushel range and wheat declining to $5 to $6 per bushel, there is less income to capitalize into land values. Moreover, production costs have risen, almost across the board, cutting into the net income per acre. Granted, the sharp drop in crude oil price in recent months has provided some relief on the cost front with the impact going well beyond the costs for gasoline and diesel fuel. One sobering factor on the demand side (particularly on the commodity futures markets) has been the role played in futures prices by the commodity funds. While the role of the funds in the steep run-up in crude oil prices is now fairly well established, the role of the investment funds in the dramatic climb of agricultural commodity prices (and subsequent declines) is less well accepted. Suffice it to say, it may not have been all demand and supply in the traditional sense.

As a consequence of several factors, mostly related to demand, farmland values declined in late 2008 and are expected to decline further in 2009 and, possibly, in 2010. Long-term, land prices are influenced by the net income from the farm commodities produced on the land in question. While a replay of land value declines in the 1980s is not anticipated, any decline affects credit availability, especially for the more heavily leveraged prospective purchasers.

Ethanol production

The boost in commodity prices was heavily related to the growth of the ethanol industry. The demand of ethanol plants for corn caused a run-up in the prices for other commodities competing for farmland, notably soybeans and, to a lesser degree, wheat. As of early 2009, approximately 170 ethanol plants were in production, representing roughly 4 billion bushels of demand for corn.

That demand appears less secure in light of the economic problems faced by the ethanol industry. More than 20 ethanol plants have filed for bankruptcy in recent months and several more have ceased operations for various financial and economic reasons. By some estimates, as much as 30 percent of ethanol capacity is idled or on slowdown.

The economic trauma in some instances has been partly the result of factors affecting all ethanol plants; in other situations, the economic hurdles have been more severe for recently-constructed plants. Dramatic fluctuations in the price of corn (the major input) and in the price of crude oil (which has a considerable influence on the price for ethanol) have wrenched the industry well beyond anything that could possibly have been anticipated by investors in ethanol plants. These are the two "brakes" that are faced by the ethanol industry. The steep rise in construction costs has contributed to the economic problems, also.

Several plants have been shuttered or are in bankruptcy because of ill-fated steps taken to manage risk with the hedges resulting in huge losses as the price of corn rose to record levels and then declined sharply to more normal levels.

The future of the ethanol industry depends heavily upon three factors—(1) the energy policy of the United States (which has been friendly to ethanol for several years); (2) the economics of conversion of feedstock (principally corn) into ethanol fuel; and (3) the emerging technologies and their competitive positions. Ethanol is likely to merit a "place in the sun" for 3 to 5 more years. Beyond that, ethanol may

well rank as a component of the package of alternative energy sources for some time in the future. Economic considerations will almost certainly be the major determinants as to which energy alternatives survive as energy sources. The energy source that can produce the units of energy needed at the lowest price and with the safety factors and reliability factors demanded by consumers will be in the driver's seat.

As for ethanol plants that are now shuttered or cannot cover their variable costs, some are likely to be sold at a discount (currently, variable costs are roughly 90 percent of the cost of producing ethanol, leaving little for fixed costs and profit for investors). A government credit line would help to buy time but is not a viable long-term solution. In the long-term, ethanol must be a competitive source of energy to survive unless subsidies continue, mandates increase and tariffs are maintained.

Impact of the meltdown on the demand for food and fiber

In recent years, the gradual increase in per capital incomes around the world, but particularly in the low-income countries, caused a steady increase in the demand for food. The income elasticity of demand for food is high in those countries (as high as 0.7 which means that 70 percent of additional income goes for food). The increase in per capital incomes was heavily related to trade, outsourcing and globalization, with production gradually moving to areas of lowest cost production and with all manner of economic activities shifting to low wage countries, raising per capita incomes.

All of that has been affected by the global meltdown in recent months with the demand for the goods and service produced in those countries declining, in some instances dramatically. This is leading to reduced demand for food, worldwide. Most of the leading importers of farm commodities from the United States have reduced imports except for China. The rising unemployment in China will likely lead to reduced demands for food in that country as the world-wide demand for the labor intensive products produced in that country slips. The World Trade Organization is predicting a nine percent decline in world trade this year.

Signs of tightening credit

Depending upon how long the economic crisis persists and how deep the trauma becomes, it will clearly affect credit availability at all levels. Denial of credit in the short-run results in economic pain and the disposal of assets serving as collateral which affects asset values in the markets. Those with weak balance sheets (high debt-to-asset ratios) generally suffer the greatest. The relatively thin band of equity capital on the part of lenders makes the lenders particularly vulnerable.

As an example, as of December 31, 2008, the Federal Deposit Insurance Corporation (FDIC) reported that as of the end of the fourth quarter of 2008, 6.93 percent of Iowa banks were unprofitable compared to 4.3 percent in the fourth quarter of 2007 and 2.87 percent in 2006. About half of the banks reported non-performing loans above one percent at the end of 2008. Although agriculture is a major part of the Iowa economy, these data do not appear to reflect weakness of the agricultural economy so much as weakness in the general economy. Agricultural banks in recent months have had a much stronger performance than similarly-sized commercial banks. However, with lower commodity prices and higher costs of production in prospect, the agricultural economy may be a greater contributor to lender problems going forward.

III. Conclusion

The economic state of the agricultural sector (both farms and ranches and rural areas generally) depends heavily on whether the world economy continues to decline. If confidence is not restored, and the financial systems continue to deteriorate, the agricultural sector will likely suffer the effects on a widespread basis. The success of the stimulus packages and the efforts to stabilize the world's financial institutions are vitally important to the agricultural sector.

My biggest concern is that the global meltdown that is being experienced has not displayed the features of a normal economic decline. The drop in economic activity that began in late 2007 appears to be more of a "downshifting" of the economy, due principally to a revolutionary shift in thinking by consumers about debt, the likely result of companies curtailing the use of high levels of debt and the corralling of patently unwise strategies employed on a widespread basis to deal with risk. Consumers, companies and governments have all been living beyond their means. That bubble has now burst. Adjustments in economic activity promise to be profound and far-reaching as the world's economy comes to reflect a more cautious use of debt at all levels, at least for the foreseeable future. That is likely to affect the buoyancy of the general economy for several years.

The CHAIRMAN. Well, we appreciate your comments, and we will have some questions, but we recognize Mr. Dumler.

STATEMENT OF TROY J. DUMLER, EXTENSION AGRICULTURAL ECONOMIST, SOUTHWEST KANSAS STATE RESEARCH AND EXTENSION, GARDEN CITY, KS

Mr. DUMLER. Mr. Chairman, Members of the Subcommittee, thank you for inviting me to testify. As Dr. Harl noted, I will try to reduce some duplication of comments that have already been made here as well.

I appear before the Subcommittee to discuss the agricultural economy. While many aspects of this discussion are relevant to producers across the country, my focus will be on Kansas, and my goal is to provide a snapshot of economic conditions in the Great Plains.

As an agriculture economist at Kansas State, I have access to farm level data from farms in the Kansas Farm Management Association, one of the largest farm management programs in the country. This information will serve as the foundation of my comments today, basically providing a farm level view of the ag economy.

The last several years have been interesting ones for Kansas producers. Following trends nationwide, average net farm income for farms in the Kansas Farm Management Association topped $115,000 in 2007, nearly double the previous record set in 2004. Final data is not yet available for Association farms in 2008, but preliminary estimates suggest that net farm income will again be high for Kansas farms, although likely not as high as it was in 2007. The record incomes in recent years can largely be explained by historically high grain prices and oilseed prices, as noted earlier. But as agriculture commodity prices increased, so did the production cost. As an example, total expense for fuel, fertilizer, crop chemicals, and seed increased 75 percent from 2003 to 2007 for Association farms. These expenses rose even more dramatically in 2008. Fortunately, fuel and fertilizer prices have dropped back from the 2008 peaks, providing the opportunity for Kansas crop producers to potentially earn a profit in 2009.

The recent record farm income masked the variability experienced by different types of farms. While farm income for crop producers has been buoyed by the rise in demand for ethanol, the higher crop prices have put pressure on livestock producers. While income on crop farms in 2007 was more than double that of 2006, it was a different story for livestock producers. In 2007, beef cattle backgrounding operations experienced a second year of negative net farm income, and losses have been historically large for cattle feeders as well. A colleague of mine is estimating that cow/calf producers in the state will not be able to cover variable costs in either 2008 or 2009.

Financial data from farms in Kansas show a sector that is in good financial condition on average. Debt-to-asset ratios and the percentage of farms that are financially stressed are substantially lower than they were during the mid-1980s, and interest rates remain low by historical standards.

Anecdotal evidence says that in spite of tightened credit market, credit is still available for good credit risks in the state. Because of the good overall financial conditions of farms and the continued

availability of credit, another farm financial crisis does not appear imminent.

However, there are currently a small percentage of farms in Kansas that are financially vulnerable. Consequently, should farm income or land values decline, or if interest rates would rise significantly, farm financial conditions could quickly deteriorate.

Finally, there is little question that commodity subsidies have reduced the income variability of Kansas farms. Even in 2007, government payments still contributed 20 percent of net farm income for Association farms. While grain and oilseeds are well above levels that would generate either countercyclical payments or loan deficiency payments, the new ACRE and SURE Programs, passed as part of the 2008 Farm Bill, offer the opportunity to support crop income in either the event of a drop in price or a drop in production.

Current discussions with farmers in Kansas, however, suggests that enthusiasm for these programs, especially the ACRE Program, may not be as high as originally anticipated.

Mr. Chairman, thanks, again, for inviting me to testify, and I look forward to an opportunity to answer any questions.

[The prepared statement of Mr. Dumler follows:]

PREPARED STATEMENT OF TROY J. DUMLER, EXTENSION AGRICULTURAL ECONOMIST, SOUTHWEST KANSAS STATE RESEARCH AND EXTENSION, GARDEN CITY, KS

Prepared by Troy Dumler, Michael Langemeier, Allen Featherstone, and James Mintert [1]

Introduction

Recent years have brought challenges and opportunities to producers across the United States. Historically high grain and oilseed prices, spurred by demand for biofuels, have pushed farm income to record levels. While this scenario has presented tremendous opportunities for crop producers, it has been burdensome for livestock producers, who have seen production costs increase dramatically. The increased production costs have not been exclusive to livestock producers, however. Fuel, fertilizer, seeds, and chemicals have all increased over historical levels. While some of these production costs have fallen over recent months, the downturn in the global economy has presented some additional challenges for agricultural producers. The global recession has put downward pressure on agricultural commodity prices and tightened credit markets. Coupling these events with a new farm bill that offers two new, complex programs designed to help farmers manage risk, makes for an interesting time in agriculture. Following is a discussion of the challenges facing Kansas producers.

Farm Income

Data from the Kansas Farm Management Association (KFMA) indicates that net farm income in Kansas has mirrored U.S. net farm income (*Table 1*). After experiencing a drop in income in 2006, net farm income, both nationwide and in Kansas, recovered to record levels in 2007. But there were some differences between Kansas and the rest of the U.S. Though U.S. net farm income was barely a record in 2007, net farm income in Kansas was actually 84 percent higher than the previous record set in 2004. Supported by historically high grain and oilseed prices, U.S. farm income is forecast to set another new record in 2008. Final KFMA data is not yet available for 2008, but preliminary data suggests that net farm income will again be high for Kansas farms—although perhaps not as high as it was in 2007.

The variability in income in recent years can largely be explained by widely fluctuating commodity prices and production costs. Following the energy markets, agricultural commodity prices increased rapidly from 2006 to 2008. *Figure 1* shows prices for diesel fuel and natural gas, two of the primary energy sources used in agriculture, from 2000–2009. The increasing energy costs and rising demand for

[1] Respectively, Extension Agricultural Economist, Professor, Professor, and Professor in the Department of Agricultural Economics, Kansas State University.

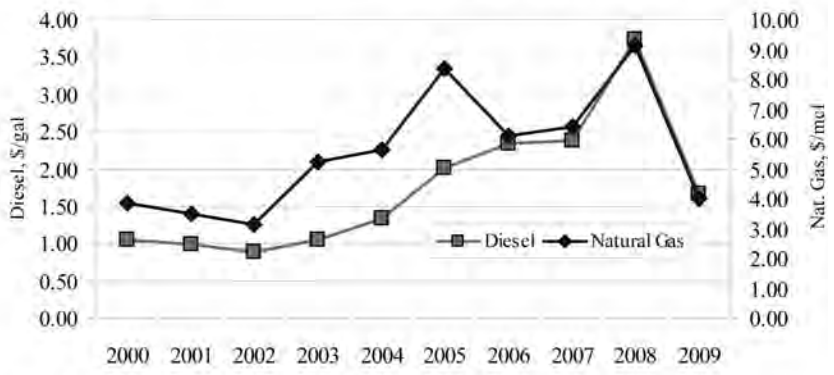
crop inputs resulted in increased crop production costs. *Table 2* shows the selected crop input expenses for KFMA farms from 2003–2007. In fact, there were significant increases in crop input expenses each year from 2003 to 2007. This was especially the case for fertilizer and diesel fuel, which increased 105 percent and 110 percent, respectively, over the 5 year period. Total expenses for the four crop inputs listed in *Table 2* increased 75 percent from 2003 to 2007.

Table 1. Net Farm Income in the U.S. and Kansas (2003–2008).

Year	U.S. (Total, $Billion)	Kansas ($/Farm)
2003	60.5	51,051
2004	85.8	62,604
2005	79.3	56,982
2006	58.5	46,593
2007	86.8	115,035
2008	89.3	N/A

Source: USDA–ERS and the Kansas Farm Management Association.

Figure 1. Average Diesel and Natural Gas Prices During Principle Farming Months



Source: Energy Information Administration

Although crop input expenses increased dramatically from 2003 to 2007, the largest increase occurred in 2008. According to the prices paid indexes published by USDA–NASS, fertilizer costs increased 80 percent from 2007 to 2008 (*Table 3*). That increase was coupled with a 56 percent increase in fuel costs, a 27 percent increase in seed costs, and a nine percent increase in chemical costs. However, as energy and agricultural commodity prices declined with the global economy in late 2008, fuel and fertilizer prices also declined. Using the price indexes in *Table 3,* it is estimated that KFMA farms would have spent $23.77 per acre and $65.71 per acre on fuel and fertilizer, respectively, in 2008. Based on current prices, KFMA farms are estimated to spend $12.42 per acre and $48.90 per acre on fuel and fertilizer, respectively, in 2009. While the estimated fertilizer costs still remain above previous levels, fuel costs are estimated to fall to levels not experienced since 2005. So, even though commodity prices have dropped significantly from the historically high levels experienced in 2008, the drop in fuel and fertilizer input costs provides the opportunity for crop farmers in Kansas to earn a profit in 2009.

Table 2. Energy Intensive Expenses for Non-Irrigated KFMA Crop Farms (2003–2007).

Expense Category	2003	2004	2005	2006	2007
Fertilizer and Lime:					
Crop Expense	$22,649	$25,556	$32,231	$33,847	$46,348
Expense/Crop Acre	$18.50	$21.19	$25.91	$26.67	$35.54
Annual Change (%)		10.2%	26.3%	1.6%	33.3%

Table 2. Energy Intensive Expenses for Non-Irrigated KFMA Crop Farms (2003–2007).—Continued

Expense Category	2003	2004	2005	2006	2007
Gas, Fuel, and Oil:					
Crop Expense	$10,545	$13,102	$17,730	$20,493	$22,179
Expense/Crop Acre	$8.62	$10.86	$14.25	$16.15	$17.01
Annual Change (%)		16.6%	26.5%	13.8%	5.3%
Herbicides/Insecticides:					
Crop Expense	$14,438	$15,030	$16,519	$18,017	$21,513
Expense/Crop Acre	$11.80	$12.46	$13.28	$14.20	$16.50
Annual Change (%)		5.6%	6.6%	6.9%	16.2%
Seed:					
Crop Expense	$15,455	$18,348	$20,498	$21,877	$27,484
Expense/Crop Acre	$12.63	$15.21	$16.48	$17.24	$21.08
Annual Change (%)		20.4%	8.4%	4.6%	22.3%
Total Expense:					
Crop Expense	$63,087	$72,036	$86,978	$94,234	$117,524
Expense/Crop Acre	$51.55	$59.72	$69.92	$74.26	$90.13
Annual Change (%)		15.9%	17.1%	6.2%	21.4%

Source: Kansas Farm Management Association.

Table 3. Annual Prices Paid Indexes (1990–1992), USDA–NASS.

Year	Fertilizer Index	Chemicals Index	Seed Index	Feed Hay/Forages Index
2003	124	121	154	115
2004	140	121	158	116
2005	164	123	168	124
2006	176	128	182	139
2007	216	129	204	164
2008	388	140	259	195
2009*	294	143	275	172

*Monthly Prices Paid Indexes, February 2009.

As higher commodity prices resulted in increased profitability over the last 2 years, demand for crop land increased as well. This increase in demand resulted in higher cash rents and land values. *Table 4* shows the average land value and cash rent for irrigated and non-irrigated crop land in Kansas from 2003 to 2008. Although land values increased each year, the largest increases in both irrigated and non-irrigated land values occurred in 2008. Given that crop production is expected to remain profitable in 2009, albeit at a much lower level than 2008, land values are expected to hold relatively steady.

Table 4. Crop Land Values and Cash Rental Rates in Kansas (2003–2008).

Year	Value		Rent	
	Irrigated	Non-irrigated	Irrigated	Non-irrigated
2003	$1,080	$645	$68.00	$36.00
2004	$1,110	$665	$72.00	$37.50
2005	$1,240	$810	$73.00	$38.50
2006	$1,300	$890	$74.00	$39.00
2007	$1,410	$980	$82.00	$41.00
2008	$1,660	$1,130	$88.00	$45.00
Annual Avg. % Change	10.7%	15.1%	5.9%	5.0%

Source: Kansas *Agricultural Statistics Service, Agricultural Land Values and Rents.*

Livestock Operations

The recent record farm income in production agriculture masks the variability experienced by different types of farms. While farm income for crop producers has been buoyed by the rising demand for ethanol, the higher crop prices have put pressure on livestock producers. Evidence of this occurring may already be evident in the KFMA data. While income on crop farms in 2007 was more than double that of 2006, it was a different story for livestock producers (*Table 5*). In particular, losses have been historically large for cattle feeders and for cattle backgrounding operations, which experienced another year of negative income. The extended period

of large losses for commercial cattle feeders is without precedent over the last 3 decades, resulting in a huge equity drain for the industry.

Table 5. KFMA Net Income per Operator by Farm Type (2003–2007).

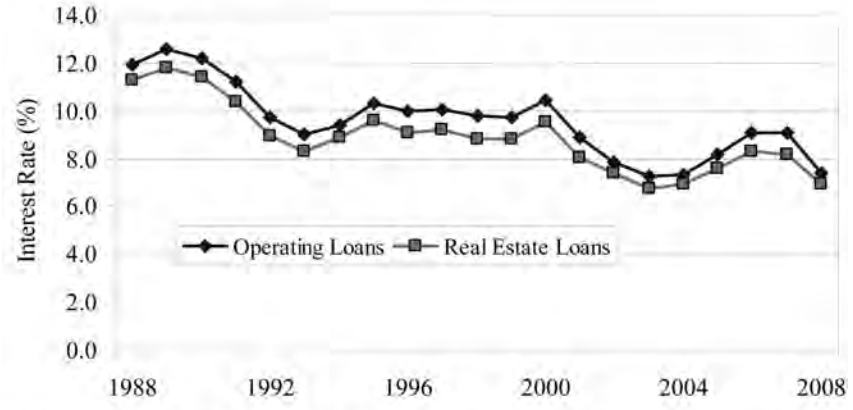
Type of Farm	No. of Farms	Net Income per Operator				
	(2007)	2003	2004	2005	2006	2007
All Farms	1,453	$52,410	$63,491	$57,584	$46,804	$116,130
Cash Crop Dryland	1,010	51,424	57,087	49,422	49,366	120,594
Cash Crop Irrigated	62	57,580	62,729	64,955	92,335	280,585
Stock-Ranch Cowherd	21	34,148	51,366	45,396	35,986	23,633
Cowherd	15	22,458	32,088	24,914	13,344	34,948
Dairy	35	24,484	71,192	52,658	25,663	82,088
Backgrounding	11	63,035	82,252	63,279	−5,823	−941
Cash Crop-Cowherd	137	33,879	49,613	50,149	31,132	61,588
Cash Crop-Dairy	11	49,643	81,068	72,799	55,538	161,507
Cash Crop-Backgrounding	29	87,728	79,308	83,820	1,203	74,803

Source: Kansas Farm Management Association.

Financial Condition of Kansas Farms

The economic downturn in 2008 was remarkable in both depth and breadth. Widely regarded as one of the most severe financial crises in recent times, there are few industries unaffected by its impact. Agriculture in the U.S. is no exception. The decline in demand for energy has resulted in a similar decline in demand for feed grains and oilseeds. While the primary consequence of the drop in demand for agricultural commodities has been a drop in price, a major consequence of the economic downturn has been a lack of available credit to businesses and consumers. In regard to the overall credit freeze, however, agriculture may be the exception. *The Survey of Tenth District Agricultural Credit Conditions* conducted by the Federal Reserve Bank of Kansas City indicates that although demand for agricultural credit has fallen somewhat during the fourth quarter of 2008, there are still funds available to lend to credit worthy agricultural producers.[2] In addition, from a historical perspective, interest rates remain low. *Figure 2* shows the annual average interest rates for operating and real estate loans in Kansas from 1988–2008.[3] The average operating loan interest rate was the third lowest over the 21 year period, while the real estate interest rate was the second lowest during the same period.

Figure 2. Historical Agricultural Interest Rates.



Source: Kansas City Federal Reserve Bank

The Kansas City Federal Reserve Bank also surveys for information on loan repayments and loan collateral requirements. The survey indicates that the average

[2] The information on credit conditions are from the Kansas City Federal Reserve Bank, *http://www.kc.frb.org/Agcrsurv/CreditConditions_KC.xls.*

[3] Agricultural interest rates are from the Kansas City Federal Reserve Bank, *http://www.kc.frb.org/Agcrsurv/InterestRates_KC.xls.*

repayment rate was lower in the fourth quarter 2008 than it was early in 2008, but was still much higher than it was from 1998 through 2003, when farm income was lower. In addition, the survey indicated that collateral required for agricultural loans increased from the fourth quarter of 2007 to the fourth quarter of 2008.

The survey from the Kansas City Federal Reserve Bank gives some indication of the financial condition of farms in Kansas, but does not tell the entire story. Given the current macroeconomic environment, it is important to examine long-term trends in financial measures. In 1985, the debt to asset ratio for U.S. farm businesses was 0.222 (USDA–ERS). In contrast, in 2007, the debt to asset ratio for U.S. farm businesses was only 0.096 (USDA–ERS). The average current ratio for U.S. farms was 3.40 in 2007. The USDA–ERS noted that the average current ratio in 2007 was considerably higher than the average current ratio of 2.90 exhibited a decade earlier. In Kansas, the change in the current ratio and the debt to asset ratio is not as dramatic for KFMA farms. *Table 6* illustrates trends in the 5 year average of the current ratio, debt to asset ratio, and financial stress from 1973 to 2007. Given variability in weather and prices, it is often useful to examine 5 year average financial measures rather than examining the averages for a single year. The 5 year average current ratio for KFMA farms for the 2003–2007 period was 2.47, which was the highest average since the 1996–2000 period. Using *Table 6,* the debt to asset ratio peaked during the 1985–1989 period at 0.330. The average debt to asset ratio for the 2003–2007 period, 0.279, was the lowest 5 year average since the 1979–1983.

Averages often hide the variability in financial measures among farms. Consequently, it is useful to examine the number of farms with low net farm income, high debt, or both. The USDA–ERS defines vulnerable farms as those with a negative net farm income and a debt to asset ratio above 0.40. Approximately 3.5 percent of U.S. farms were classified as vulnerable in 2007 (USDA–ERS). Using these criteria to define vulnerability, approximately 6.8 percent of KFMA farms were vulnerable in 2007.

Negative earnings and a debt to asset ratio above 0.70 are used in *Table 6* to define financial stress for KFMA farms. Earnings are computed by subtracting unpaid operator and family labor from net farm income. Approximately 45 percent and 11 percent of the farms had negative earnings and a debt to asset ratio above 0.70, respectively, for the 2003–2007 period. Combining these two items, approximately 6.4 percent of the KFMA farms were financially stressed. The level of financial stress is substantially lower than that experienced in the mid-1980s, but is still higher than the averages experienced in the 1970s. The percentage of farms with negative earnings and a debt to asset ratio of 0.70 was 45 percent and 15 percent during the 1985–1989 period, the most recent peak financial stress years in the U.S.

Farms with negative earnings and/or high debt to asset ratios are more vulnerable to the current credit crisis than farms that have lower debt levels and that have experienced relatively high net incomes in recent years. These farms may find it increasingly difficult to generate a positive cash flow and repay debt.

To summarize, credit is available for the 2009 planting season for good credit risks. Certainly, the underwriting standards have increased in order to obtain that credit, but farmers with good repayment histories and fairly strong balance sheets are able to obtain the credit they need. Borrowers should expect to be required to put up more collateral going forward than in the past. Borrowers of marginal credit quality in the past may see more difficulty in obtaining credit in 2009 than in the past. In addition, there likely will be larger differences in interest rates among borrowers than in the past. Because of the overall good financial condition of farms in Kansas and the U.S., and the continued availability of credit, another farm financial crisis does not appear imminent. However, should farm income and/or land values decline, or interest rates rise rapidly, farm financial conditions could deteriorate quickly.

Table 6. Trends in Liquidity, Solvency, and Financial Stress for KFMA Farms.

Years	Current Ratio	Debt to Asset Ratio	Financial Stress
73–77	2.23	0.217	0.69%
74–78	2.06	0.225	0.01%
75–79	1.97	0.236	1.38%
76–80	2.03	0.237	1.45%
77–81	2.08	0.245	1.83%
78–82	2.08	0.256	2.31%
79–83	2.16	0.265	3.14%

Table 6. Trends in Liquidity, Solvency, and Financial Stress for KFMA Farms.—Continued

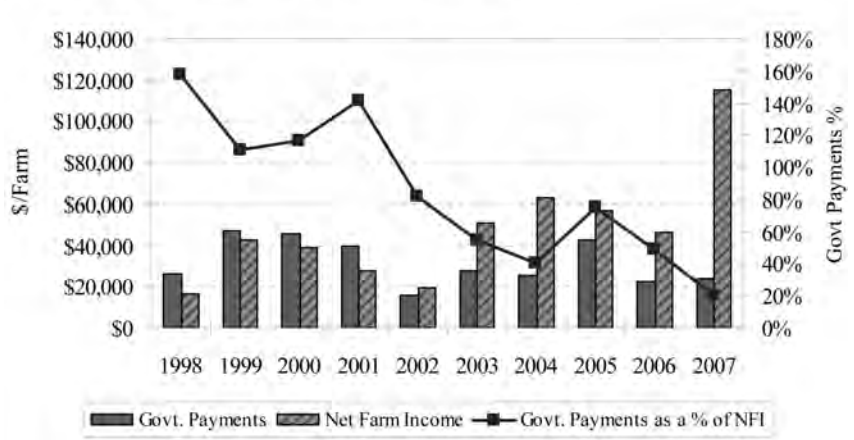
Years	Current Ratio	Debt to Asset Ratio	Financial Stress
80–84	2.12	0.281	6.73%
81–85	2.06	0.294	7.61%
82–86	2.11	0.304	8.77%
83–87	2.13	0.313	9.49%
84–88	2.17	0.320	10.10%
85–89	2.24	0.330	10.84%
86–90	2.36	0.320	8.51%
87–91	2.51	0.310	8.34%
88–92	2.50	0.306	7.29%
89–93	2.56	0.302	7.21%
90–94	2.56	0.301	8.10%
91–95	2.52	0.304	9.20%
92–96	2.55	0.299	6.87%
93–97	2.58	0.295	6.79%
94–98	2.61	0.291	8.15%
95–99	2.54	0.290	6.98%
96–00	2.51	0.296	7.03%
97–01	2.43	0.301	8.20%
98–02	2.35	0.301	9.67%
99–03	2.31	0.301	9.47%
00–04	2.32	0.302	9.11%
01–05	2.34	0.299	9.89%
02–06	2.36	0.293	8.92%
03–07	2.47	0.279	6.39%

Source: Kansas Farm Management Association Newsletter, Volume 2, Issue 12. December 2008.

Government Payments

Government payments have contributed significantly to farm income in Kansas over the past 10 years. As shown in *Figure 3,* from 1998–2001, government payments (including all commodity, conservation, and disaster assistance payments) averaged over 100 percent of net farm income for KFMA farms. From 2002–2007 government payments averaged 54 percent of net farm income. As market prices have increased in recent years, the relative importance of government payments as a contributor to net farm income has decreased, as government payments were only 20 percent of net farm income in 2007.

Figure 3. KFMA Government Payments vs. Incomes, 1998-2007.



Three factors could have a negative impact on crop income in 2009: a decline in commodity prices, an increase in production costs, and a drop in production. While

grain and oilseed prices are well above levels that would generate countercyclical payments or loan deficiency payments, two new government programs could potentially provide significant payments to producers in the event of a decline in crop revenue. The Average Crop Revenue Election (ACRE) and Supplemental Revenue Assistance (SURE) programs each offer the opportunity to support crop income in the event of drop in price and/or production. Because the final details of these programs have not been published, it remains to be determined how large payments from these programs may be. However, preliminary analysis suggests they could offer significant support in scenarios in which prices or production falls significantly. With the ACRE program specifically, the question remains whether producers will participate in large numbers. The Food and Agricultural Research Policy Institute (FAPRI) estimates that the majority of corn, soybean, and wheat producers will choose to participate in ACRE while the majority of cotton, rice, and peanut producers will not participate.[4] Anecdotal evidence suggests producers in Kansas may not sign up for ACRE in large numbers. The reasons for the lack of interest in ACRE likely include understanding the complexities of a new program, the unwillingness to give up guaranteed money (a 20 percent reduction in direct payments) for potential payments, and concerns that farms will incur revenue losses but the state will not—resulting in no payments to the producer. Although ACRE may offer some risk management protection not available in previous commodity programs, the overall level of support it offers could be mitigated by the level of participation.

The CHAIRMAN. Thank you. Dr. Angle.

STATEMENT OF J. SCOTT ANGLE, PH.D., DEAN AND DIRECTOR, COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES, UNIVERSITY OF GEORGIA, ATHENS, GA

Dr. ANGLE. Thank you and good morning. Again, I am Scott Angle, the Dean and Director of the College of Agricultural and Environmental Sciences at the University of Georgia. I am also a farmer.

I am here to give you my assessment of agriculture, in light of the current economy, and to discuss what I see as the primary issues facing us both in the long and the short term. Most of what I will discuss today will relate to the southeastern region part of this great nation. Much of my testimony will focus on issues that seem like problems, and indeed, many are.

However, please know that for the long run, I remain quite positive. I say this for several reasons. It is crystal clear that rising population and enhanced nutritional demands of emerging societies will require food production to double by the year 2050, yet the amount of land available for food production is unlikely to increase. In fact, as reforestation removes land from agricultural production, the amount of land used for food production may actually decline during this period. Therefore, the amount of food produced per acre will have to double by the year 2050.

Just where this increase will occur will depend on geopolitics, climate, climate change, and a variety of environmental considerations. For example, it is unlikely that Europe will adopt new and emerging technologies to increase food production. In the United States, agricultural patterns are changing as our climate changes. In particular, climate change is likely to exacerbate drought conditions in much of the western part of the United States. The drought we now see in California may actually become a permanent feature as the climate warms.

[4] FAPRI U.S. Baseline Briefing Book #01–09, available at: *http://fapri.missouri.edu/outreach/publications/2009/FAPRI_MU_Report_01_09.pdf.*

This suggests that the eastern half of the United States will need to produce greater amounts of food than it does today. The Southeast is blessed with a long growing season, abundant sunlight, good soils, and reasonable amounts of rainfall and irrigation water. Thus, it is clear that agriculture in the southeastern part of the United States must continue to grow if world food demand is to be met.

I also remain fundamentally optimistic for U.S. agriculture for two additional reasons. I believe there is an inherent and lingering appreciation of the rural lifestyle, the values held by our rural citizenry, and the cultural heritage that exists only in these areas of our country. These are vital components of our culture that no one wants to lose. And last, I also believe that you, our elected political leaders, understand better than anyone that food production is an issue of national security. We can't always count on other countries to produce for us. Previous food safety incidents have shown how a single accident can close imports of an entire commodity. Intentional contamination of the food supply would not be difficult, and can paralyze an entire products' entry into the United States for an extended period of time.

Despite the long term positive potential, we are facing several very significant and complicated challenges that will make the next 2 years difficult for both southeastern and U.S. agriculture. There are few sectors of agriculture that traditionally, and certainly, in the current economic downturn, will not do well. For example, the green industry and high priced foods will not do well. These items tend to fall more within those areas that customers can do without when disposable income is reduced. Meat sales are also likely to decline further, as the U.S. dollar strengthens. A high dollar hurts exports and aids imports. This is especially important for the poultry industry, the largest segment of Georgia agriculture, where exports are an important component of that overall market.

Macro trends will also have a significant impact on the future of southeastern agriculture, and I would like to discuss a few of these, and how they may shape our future. The unprecedented droughts in the Southeast over the last 2 years, which by the fact, are still far from over, despite recent rainfall, has clearly demonstrated that water is not an unlimited resource, and that we will have to better plan for its use, if agriculture is to be sustained and even grow.

Southeastern states need to do a much better job of planting and developing and deploying infrastructure policies and technologies to be able to move to meet future demand for water in both agricultural and nonagricultural use. This issue is particularly critical during drought periods. There is no reason to dump millions of cubic meters of water into the Gulf of Mexico at the expense of agriculture.

As a resident of Georgia, the country's largest producer of peanuts, I cannot go without discussing food safety. The reported incidents of foodborne illness has increased in recent years. Two major steps need to be taken to stem this trend. First, we need to institute improved, science-based food safety standards, and we need to establish audit-compliant programs that identify the gaps in the network, that is to provide field to fork safety of the entire food supply. Both programs necessitate an investment in the under-

standing of production, harvest, and processing of all aspects of the food supply chain.

Labor is obviously an area that has been hotly debated for decades, and one that still cries out for a solution. Whatever the solution, it is imperative that Federal policies enable agricultural producers to have access to competent field labor at reasonable wages. As the market for locally grown, sustainable food increases, more and more of our food will be grown within a few hundred miles of where it is consumed. The concept of food miles is a driving factor that will assure increases in local production. However, without competent field labor, none of this will be possible, and the potential increase in food and fiber production will not be realized.

One of the most pressing issues for the southeastern agricultural community is the most recent farm bill. Nearly the entire southeastern farm community does not want the farm bill to be reopened. Most Farm Bureaus, I believe, have gone on record to this effect. Any changes to the farm bill are likely to be less favorable to the southeastern farms in this region.

A related issue is that the U.S. needs to more aggressively promote sales of U.S. agricultural products around the world. Foreign sales of agricultural products remain one of the bright spots for U.S. trade. We hope future trade agreements will not be made which benefit other sectors of our economy, at the expensive of agriculture. In the year 2007, agriculture was one of the areas that alleviated our trade deficit. This year, we imported $79 billion of food and fiber, while we exported $116 billion in exports.

One last area that is important is in the area of farm finance, which you have already heard. The farm credit industry has been regulated through the USDA, and has been successful even during most of the credit crunch. Indeed, this is one of the reasons why agriculture has been able to move forward, while so many industries have been suffering. Please don't lump the farm credit system in with solutions for Fannie Mae and Freddie Mac. We should not attempt to fix that which is not broken.

Finally, I cannot leave this testimony without mentioning biofuels. The southeastern part of the United State has been labeled the Saudi Arabia of bioenergy. This is because we have abundant sunlight, a long growing season, adequate rainfall, and a long history of pine production. The exact role plants will play in energy production, in my opinion, remains to be seen. Nearly everyone agrees that energy production from grains, especially corn, is only a short-term solution. Cellulosic ethanol is the long-term hope for ethanol from plants, especially pine. However, important technology breakthroughs must be developed before we can expect to see widespread use of cellulosic ethanol in the United States. Whether or not this breakthrough come next year or 20 years from now still remains to be seen.

There are serious issues facing agriculture today and in the future. Some, we can control, others we cannot. We are good stewards of the land and our natural resources, and we are a strong and stable segment of our nation's economy. My message to you today is relatively simple. Given sound policies, strong support, solid investment in research and education, and stepped-up focus on food safety, security, science, and trade, the agricultural indus-

try of the United States is poised to meet the demand for feed and food, and to nourish a growing population.

Thank you for the opportunity to be with you today.

[The prepared statement of Dr. Angle follows:]

PREPARED STATEMENT OF J. SCOTT ANGLE, PH.D., DEAN AND DIRECTOR, COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES, UNIVERSITY OF GEORGIA, ATHENS, GA

Thank you for the opportunity to speak to you today. I am the Dean and Director of the University of Georgia College of Agricultural and Environmental Sciences. My background is in soil science. I have specifically worked to develop agriculturally friendly ways to clean polluted soil. I am also a farmer. My farm is just east of Frederick, Maryland.

I am here to give you my assessment of agriculture today and to discuss what I see as the primary issues facing agriculture both in the short term and the long term. Most of what I discuss today will relate to the southeast region of our nation.

Much of my testimony will focus on issues that seem like problems, and, indeed, many are. However, please know that for the long run, I remain quite positive. I say this for several reasons. It is crystal clear that rising population and enhanced nutritional demands of emerging societies will require food production to double by the year 2050. Yet, the amount of land available for food production is unlikely to increase. In fact, as reforestation removes land from agricultural production, the amount of land used for food production may actually decline. Thus, the amount of food produced per acre will have to double by 2050.

Just where this increase will occur will depend upon geopolitics, climate and climate change, and environmental considerations. For example, it is unlikely that Europe will adopt new and emerging technologies needed to increase food production. In the United States, agricultural patterns are changing as our climate changes. In particular, climate change is likely to exacerbate drought conditions of the western U.S. The drought we now see in California may become a permanent feature as the climate warms.

This suggests that the eastern half of the U.S. will need to produce greater amounts of food than it does today. The Southeast has a longer growing season, abundant sunlight, good soils and reasonable amounts of rainfall and groundwater for irrigation. Thus, it is clear that agriculture in the southeastern U.S. must continue to grow if world food demand is to be met.

A brief review of recent history tells us it is certainly possible to increase crop production on static land resources in this country. Remember, for years Malthusian predictions were that mass starvation was inevitable as populations increase and food production could not keep up. The evidence has been just the opposite.

Food production has kept up both with population and improving nutrition of those living in less-developed societies. In fact, there is currently a surplus of food worldwide. We all know that there are still starving populations in the world. Most often the situation is not a lack of ample food, but rather the result of an inability to move food to where it is needed. Frequently, food delivery is impeded by local political instability.

There is every reason to believe that rising yields and improved nutrition in agriculture will continue for many years to come. Most yield increases have come from the introduction of new technologies. I can promise you, as someone who works in the area, the U.S. system of agricultural research and education will continue to produce the incredible discoveries that have driven the success of American agriculture.

Recent evidence from Georgia, for example, tells us that farm production continues to increase. Just look at changes from 2007 to 2008. The year 2008 was a terrible year for Georgia farmers. One of the worst droughts on record played havoc on nearly every aspect of agriculture. Some commodities like the green and landscape industries were decimated when watering bans assured your new plants would not survive. But, despite the drought and emerging economic downturn, 2008 was better in terms of farm-gate value than 2007.

This is a testament to the tenacity and creativity of our farmers who can still make money in the face of so many problems. For 2008, the total value of farming and processing in Georgia was $55 billion. The industry generated 356,000 jobs for the state—a source of jobs that has remained relatively stable even as the economy continued to deteriorate. This only confirms what we have known for many years; agriculture, while not immune from economic downturns, is less impacted than most sectors of our economy.

By the way, two other interesting facts about farming in the southeast: The general perception is that we have fewer farms than in the past and that farms are getting larger due to consolidation. Instead, just the opposite is true. We have more farms than we did just 10 years ago, and the farms are actually smaller by compared to the same time. This does suggest that more and more farming families are working off the farm to support their weekend work on the farm.

I also retain a fundamental optimism for U.S. agriculture for two additional reasons. I believe there is an inherent and lingering appreciation for the rural lifestyle, the values held by our rural citizenry, and the cultural heritage that exists only in these areas of the country. These are vital components of our culture that no one wants to lose.

Last, I also believe that you, our elected political leaders, understand better than anyone that food production is an issue of national security. We can't always count on other countries to produce for us. Previous food safety incidents have shown how a single accident can close imports of an entire commodity. Intentional contamination of the food supply would not be difficult and could paralyze an entire product entry into the U.S. for an extended period of time.

For this reason, no one wants to have our food production shipped overseas. We have seen clearly with imported energy supplies how easily we can be at the mercy of others who may not always like us. It's bad to be dependent on imported fuel. It would be disastrous if we depended on other nations for our food. Remember, we have only an 11 day supply of food in our food chain. If that chain is broken, critical problems arise almost immediately.

We never want to be in a position where food can be used as a political weapon against us. We must not forget the lessons the French learned during World War II when Germany stopped imports of food into France. That single Act helped to pacify the French population with relatively little effort on the part of the Germans.

I know I am preaching to the choir, but this is a message some, who have absolutely no connection to agriculture, seem to have forgotten. Unlike other industries that can be brought back online after a prolonged period of inactivity, agriculture is very different. It is not just training workers in the science and practice of agriculture. Rather, agricultural knowledge is learned over generations, is location-specific and is part of the ingrained heritage of a farming community. It may be impossible to ever bring back this knowledge once lost.

So, to reiterate, despite many of the problems I will be discussing, there is a crucial need for agriculture to continue to grow and there are unique opportunities in the southeastern U.S. to meet this demand. I remain very optimistic.

Despite the long-term, positive potential, we are facing several very significant and complicated challenges that will make the next few years quite difficult for U.S. agriculture.

I noted previously that agriculture is in relatively good shape over the coming years. However, there are a few sectors of agriculture that traditionally and certainly in the current downturn, will not do well. The green industry and high-priced foods will not do well. These items tend to fall more within those areas that consumers can do without when disposable income is reduced. Meat sales are also likely to further decline as the U.S. dollar strengthens—a high dollar hurts exports and aids imports. This is especially important for the poultry industry, the largest segment of Georgia agriculture, where exports are an important component of the overall market.

Again, in the short term, we expect to see some commodities perform better than others. The prediction for the southeast for 2009 is that there will be an increase in acres of soybeans and grain sorghum while the acreage of corn, peanuts and wheat will decline. There will be no change for cotton and tobacco.

Broiler production will continue to decline, which is good for the overall industry because prices will increase to the point where many integrators will become profitable. Unfortunately, if you are one of the growers or factory workers affected by reduced production, the change is clearly personally devastating.

Red meat production is predicted to increase over the next few years. Whether producers make any money depends upon input costs, something that so far has been very difficult to predict. Dairy production is the one area where we remain relatively pessimistic. We see few scenarios where the price of milk will improve and dairy will resume a profitable upward trend.

Macro trends will also have a significant impact upon the future of southeastern agriculture. I would like to discuss a few issues and suggest how each may shape our future.

Water is an overarching factor affecting the future of agriculture. The western U.S. has worked for years to develop good water policies and agriculture has responded to these policies in terms of growth, location and profitability. The South-

east, however, has always assumed that our water supplies were unlimited. Rainfall was deemed to be nearly adequate with abundant surface and groundwater supplies available for irrigation when needed.

The unprecedented drought over the past 2 years (which still is far from over despite recent rains) has clearly demonstrated that water is not an unlimited resource and that we have to better plan for its use if agriculture is to be sustained and even grow. States need to do a better job of planning and developing/deploying infrastructure, policies and technologies to be able to meet future demand for water in both agricultural and non agricultural use. This issue is particularly critical during drought periods—there is no reason to dump millions of cubic meters of water into the Gulf at the expense of agriculture.

Water shortages in agriculture during prolonged droughts can irreversibly harm agriculture. The current drought has done just that to the green industry in the Southeast. A significant percentage of landscape, nursery, and horticulture businesses went out of business in the face of falling sales to homeowners who could not water recently installed plants. Coupled with the region's building bust, huge declines in sales to contractors who were not building crippled the industry.

As a representative from Georgia, the country's largest producer of peanuts, I can not go without discussing food safety. The incidence of foodborne illness has increased in recent years. Two major steps need to be taken to stem this trend. First, we need to institute improved, science-based food safety standards. And, we need to establish audit compliant programs that identify the gaps in the network that is to provide "field to fork" safety of the food supply. Both programs necessitate an investment to understand the production, harvest and processing aspects of the food supply chain.

It is well recognized that animals and plants can be contaminated with human pathogens in many places along the food chain. The significance of food safety can be seen in the impact of the 2008 *Salmonella*-tomato debacle which had a $25.7 million negative impact on Georgia's economy. In conjunction with the relevant Federal agencies, a coordinated research and development effort to gain fundamental and practical knowledge of the interactions of human pathogens with the plants and animals that become our food is paramount.

We can never compete with a number of lesser developed countries where labor costs are low, land costs are a fraction of that in the U.S., and environmental regulations are rarely enforced. Our only competitive advantage is for our farmers to be on the cutting edge of the technology curve. The unique partnership of land-grant universities, the Federal Government through the USDA and private industry has allowed the American farmer to maintain the technological advantage for over 100 years. Yet, as other countries adopt the technologies we develop then modify these technologies for low-cost production, we are under constant stress to push farther ahead of the curve. This issue is particularly important for labor-intensive crops.

Labor is obviously an area that has been hotly debated for decades and one that still cries out for a solution. Whatever the solution, it is imperative that Federal policies enable agricultural producers to have access to competent field labor at reasonable wages.

As the market for locally grown, sustainable food increases, more and more of our food is being grown within a few hundred miles of where it is consumed. The concept of "food miles" is also a driving factor that will assure increases in local production. However, without competent field labor, none of this will be possible and the potential increases in fruit, vegetable and tree nut production will not be realized.

One of the most important issues for the southeastern agricultural community is the most recent farm bill. Nearly the entire southeastern farm community does not want the farm bill to be reopened. Most farm bureaus has gone on record to this effect. Any changes to the current farm bill are likely to have less favorable impact on farms and farmers.

A related issue is that the U.S. needs to more aggressively promote sales of U.S. agricultural products around the world. Foreign sales of agricultural products remain one of the bright spots for U.S. trade. We hope future trade agreements will not be made which benefit other sectors, but at the expense of agriculture.

In 2007, agriculture was one of the areas that alleviated our trade deficit. That year we imported $79 billion *versus* $116 billion in exports. Don't kill the golden goose.

One last related area is farm finance. The farm credit industry has been regulated through USDA and has been successful even during the most recent credit crunch. Indeed, this is one of the reasons why agriculture has been able to move forward while so many other industries are suffering. Please don't lump the farm credit system in with solutions for Freddie Mac and Fannie Mae. We should not attempt to fix that which is not broken.

A seldom considered issue, but one that will have a significant impact on the future of agriculture, is that we must consider supporting the economic development of less-developed countries. As I noted previously, much of the future demand for U.S. agricultural products will come from rising incomes, and thus rising consumer demand, for our products. It is rare when we can help agriculture while at the same time "doing the right thing" for many of the world's poor.

I want to call your attention to a few other issues that farmers tell me are important problems for the industry, yet do not fall into the "macro" category. One is Roundup resistant pigweed. This invasive weed threatens to significantly reduce yields of a variety of crops. Roundup is the primary tool to manage pigweed. As this weed develops greater tolerance to Roundup, the primary weed control technology used in the U.S., we face losing entire crops, especially cotton, or at least the use of no-till cultivation which has many useful environmental benefits. Research is desperately needed to find alternative strategies to control pigweed.

Second, methyl bromide is used to sterilize soil prior to planting disease-sensitive crops. Methyl bromide is being taken off the market in stages, depending upon the crop and need. However, there are few effective replacements available and yields are likely to be negatively affected. Again, research is needed to find suitable replacements.

Finally, I can not leave this testimony without mentioning biofuels. The southeastern part of the U.S. has been labeled the Saudi Arabia of bioenergy. This is because we have abundant sunlight, a long growing season, adequate rainfall and a long history of pine production.

The exact role plants will play in energy production remains to be seen. Nearly everyone agrees that energy production from grains, especially corn, is a short-term solution. Cellulosic ethanol is the long-term hope for energy production from plants, especially pine trees. However, important technological breakthroughs must be developed before we can expect to see widespread use of cellulosic ethanol in the U.S. Whether this breakthrough comes next year or 10 years from now remains to be seen.

There are serious issues facing U.S. agriculture today and in the future. Some we can control, others we cannot. There are few we cannot overcome. We are good stewards of the land and our natural resources. And, we are a strong, stable segment of the nation's economy. My message to you today is: Given sound policy, strong support, solid investment in research and education, and stepped-up focus on food safety, security, science and trade, the U.S. agricultural industry is poised to meet the demand to feed and nourish the growing world population.

The CHAIRMAN. Thank you, sir. I recognize Dr. Paggi.

STATEMENT OF MECHEL "MICKEY" S. PAGGI, PH.D., DIRECTOR, CENTER FOR AGRICULTURAL BUSINESS, COLLEGE OF AGRICULTURAL SCIENCE AND TECHNOLOGY, CALIFORNIA AGRICULTURAL TECHNOLOGY INSTITUTE, AND ADJUNCT PROFESSOR, DEPARTMENT OF AGRICULTURAL ECONOMICS, CALIFORNIA STATE UNIVERSITY, FRESNO, FRESNO, CA

Dr. PAGGI. Thank you, Mr. Chairman, Members of the Committee. Again, my name is Mechel Paggi. I am the Director of the Center for Agricultural Business at California State University, Fresno, and I appreciate the opportunity to testify today on the state of the farm economy in California.

Today, the economic viability of California agriculture is being challenged. Arguably, the most important and immediate challenge facing California agriculture is the availability of water. California is currently in the third year of a drought, with conditions among the worst in recent memory. In addition, Federal judicial action has restricted deliveries of water from the North to the South in efforts to enhance the environment for certain endangered fish species.

A recent study estimates that as a result of the cutback in water availability, we will lose about $2 billion in income in the Central Valley of California. Excuse me. The same study estimates about

850,000 acres of cropland in California will be idle. The study estimates a loss of 70,000 jobs in farming and support industries, jobs in many of the small towns and rural towns in California, towns like Firebaugh, Mendota, where unemployment is likely to reach 40 percent.

At the same time, California producers are struggling under drought conditions, the worst economic recession in 26 years in the U.S., and a related global economic downturn has created a whole other set of problems for California agriculture. Declining export demand has contributed to collapse in commodity prices. The decline in the demand for cheese has contributed to a rapid decline in California milk prices. The current downturn in the dairy industry has negative spillover effects in the California feed and hay market as well.

A few specific examples help demonstrate the magnitude of the problems facing California agriculture. Over the past year, the price for Class I milk has declined by over 38 percent. At the same time, the price of supreme alfalfa hay delivered to those dairies in Tulare, Visalia, and Hanford Counties, were sold for around $265 a ton last year. That same hay is selling for about $163 a ton this year.

These problems are hopefully cyclical in nature. However, there are elements of the issues facing California agriculture that involve programs and policies affecting the agricultural economy that persist across markets and climate fluctuations. The current problems associated with the lack of water availability to agriculture will not disappear with a return to normal weather. California water use, within the context of the existing storage and conveyance systems, is likely not sustainable. The solution to this problem will require a combination of increasing storage capacity, increased conveyance capability, and increased adoption of conservation practice among all users.

Another area of concern is linked to California agriculture's dependency on a reliable agriculture labor supply. California agriculture producers, particularly grape, tree fruit, and berry farmers, employ around 450,000 workers during the peak harvest season. Some reports indicate that as much as 85 percent of this farm labor payroll is made up of undocumented workers. The development of a program to establish a legal and reliable agricultural workforce is critical to the agricultural economy of California.

Food safety: Not too long ago, an outbreak of *Salmonella saintpaul* was initially attributed to fresh tomato consumption. Ultimately, the outbreak strain of *Salmonella saintpaul* was traced to Serrano peppers grown on a farm in Tamaulipas, Mexico. Not a single tomato linked to ill persons was found to test positive for *Salmonella*, but the damage was done. Industry estimates put the loss to the tomato industry in excess of $100 million. In California, retail sales of tomatoes were down more than 50 percent, even after tomatoes had been cleared from suspicion. These events suggest the need for an examination of FDA programs and policies, with a view toward discovering what can be done to prevent future unsubstantiated warnings and related disruptions, market disruptions.

Trade policy: California agricultural products are highly dependent on export markets. However, in some cases, producers are subject to market disruptions that result from trade policy decisions over which they have no control. The recent canceling of the NAFTA cross-border trucking program with Mexico is a ready example. The most disturbing aspect of this immediate dispute is Mexico's intention to place a 45 percent tariff on the imports of fresh grapes to Mexico. Mexico is the second largest market for California fresh grape exports, accounting for almost $50 million in 2008. Clearly, this is policy action that has a negative effect on the growing market for California agricultural products in Mexico.

There are many areas that need to be addressed, and the time is short: the infrastructure, a revitalization of roads, ports, and rails; the development of programs designed to promote agricultural contributions to carbon sequestration; the role of biofuels; the improvements to border security, to prevent entrance of damaging foreign pests and disease, to name a few. The agricultural community in California and our elected representatives will need to work together with our colleagues from other states and other industries and interest groups, to develop innovative policies and programs that address the issues discussed here today.

Thank you again for arranging for this public hearing to better understand the state of the agricultural economy, and for allowing me to share my views on the current issues facing California agriculture.

Thank you.

[The prepared statement of Dr. Paggi follows:]

PREPARED STATEMENT OF MECHEL "MICKEY" S. PAGGI, PH.D., DIRECTOR, CENTER FOR AGRICULTURAL BUSINESS, COLLEGE OF AGRICULTURAL SCIENCE AND TECHNOLOGY, CALIFORNIA AGRICULTURAL TECHNOLOGY INSTITUTE, AND ADJUNCT PROFESSOR, DEPARTMENT OF AGRICULTURAL ECONOMICS, CALIFORNIA STATE UNIVERSITY, FRESNO, FRESNO, CA

Chairman Boswell, and Members of the Subcommittee, my name is Mechel Paggi, I am the Director of the Center for Agricultural Business at California State University, Fresno. I appreciate the opportunity to testify today on the state of the farm economy in California.

California has the largest agricultural economy in the United States. If California was a country it would be the fifth largest agricultural producer in the world in terms of agricultural revenue as a percentage of GDP. Farm production generates around $36 billion in annual revenue to our state. In addition, activities related to the processing, transportation, handling and marketing of products such as milk, tree nuts, grapes, processing tomatoes, cotton, vegetables and nursery products create additional jobs, income and tax revenues that are vital to state. For every $1 billion in farm sales, there are about 18,000 jobs created in the state in the farm sector itself plus another 7,000 in other industries.

About ½ of all the fruits, vegetables and nuts grown in the United States come from our state. California products play a major role in programs designed to enhance child nutrition by supplying fresh fruits and vegetables for school lunches and snacks.

California agriculture is also integrally linked to the global economy. On average 28% of California's agricultural products go to international markets. Exports of some important crops such as tree nuts regularly amount to over 50% of California production. The on-farm value of California's agricultural exports exceeds $10 billion and the final export value is many times greater. For every $1 billion in exports 16,000 jobs are created. Our nation's agriculture is one of the few segments of our economy that enjoys a positive world trade balance and California is a big part of that accomplishment.

Unlike many other states the majority of California agricultural producers are not participants in commodity programs that provide direct income and price supports.

Government payments make up less than 3% of gross farm revenue in California compared to areas like the Midwest where farm payments account for around 11%. However, California agriculture does benefit from some Federal and state programs and policies that provide support in areas such as marketing and market information and plant and animal health and safety.

Today the economic viability of California agriculture is being challenged. A number of factors have combined to create an environment that is making it difficult, if not impossible, for growers who are among the nation's most innovative, in one of the most productive agricultural areas in the world, to maintain their current operations.

Arguably the most important and immediate challenge facing California agriculture is the availability of water. California is currently in the third year a drought with conditions among the worst in recent memory. The lack of adequate rainfall and snow pack has resulted in the lowest average reservoir levels in 17 years and severely diminished recharge of ground water supplies. In addition Federal judicial action has restricted deliveries of water from the north to the south in efforts to enhance the environment for certain endangered fish species.

The climate related drought and legal restrictions will combine in 2009 to severely restrict the flow of water from the two largest water storage and conveyance projects in California. The U.S. Bureau of Reclamation has informed producers in the western central San Joaquin Valley they can expect to receive zero deliveries of water from the Federal Central Valley Project (CVP) this year, down from 45 percent last year. The CVP supplies about ¼ of the water used by California farmers and is the primary source of water for the 600,000 acre Westlands Water District (WWD) in western Fresno and Kings Counties. The WWD is the largest irrigation district in the United States; farms in the district produced about $1.3 billion in agricultural products in 2008. Reports indicate deliveries from the State Water Project (SWP) are expected to decline to 15 percent, from 35 percent last year. The SWP is the state's largest water delivery system serving Southern California

A recent study by UC-Davis estimates that as a result of the cutback in water availability we'll lose about $2 billion in income Central Valley. That same study estimates about 850,000 acres of cropland in California will be idled resulting in a reduction of about $800 million from lost farm revenue and additional $1.2 billion decline in income associated with a loss of some 70,000 jobs in farming and support industries, many in the valley's small, rural towns. Towns like Firebaugh and Mendota, where unemployment is likely to reach the 40 percent range. While conditions are most severe in the San Joaquin Valley, the Department of Water Resources estimates indicate losses of around $300 million distributed across the North, Sacramento Valley, Central Coast and Southern regions.

At the same time California producers are struggling under drought conditions, the worst economic recession in the 26 years in the U.S. and related global economic downturn has created another set of problems for California agriculture. For example, the tightening of credit markets has made access to funds for investments in water saving technologies (*e.g.,* subsurface drip systems) and new wells for supplemental ground water supplies, more difficult. Declining export demand has contributed to a collapse in commodity prices. The decline in foreign demand for cheese has contributed to a rapid decline in California milk prices. The current downturn in the dairy industry has negative spillover effects in the California feed and hay markets as well as support industry services. Cut backs in orders from China, India and other important overseas customers in the face of another record crop have contributed to a fall in almond prices. Few, if any, agricultural products in the state have not seen negative effects from current economic environment.

A few specific examples help demonstrate the magnitude of the problems facing California Agriculture. The statewide average price for Class I milk was $18.81 May, 2008; the March 10, 2009 reported price was $11.60 a decline of over 38%. The reference prices for dairy products (butter, cheddar cheese, non-fat dry milk and dry whey) have declined from $18.91 per lb. to $12.05 per lb. State average milk production costs, even with reduced feed costs are in the $12 to $14 dollars per cwt range.

As one California analyst put it, when the buyer of 75 percent of the hay and feed produced in the state is hurting financially we have a problem. The weighted average price for supreme alfalfa hay delivered to dairies in the Tulare-Visalia-Hanford area sold for around $265 last year, on March 27, 2009 that same class of hay is selling for $163 per ton.

These problems are hopefully cyclical in nature; rain and snow will return to replenish our reservoirs and recharge the ground water; and the economy will recover here and abroad. However there are elements of the current water crisis and other

issues facing California agriculture that involve programs and policies effecting the agricultural economy that persist across market and climate fluctuations.

The current problems associated with the lack of water available to agriculture will not disappear with a return to normal weather patterns. California water use within the context of the existing storage and conveyance systems is likely not sustainable. Department of Water Resources reports indicate that even in periods of average precipitation California has an overdraft of around 2 million acre-feet. The solution to this problem will require a combination of increasing storage capacity, increased conveyance capability and increased adoption of conservation practices among all users. To implement these solutions will require a public-private sector partnership at the local, state and Federal level. In addition some consideration must be given to modifications of existing Endangered Species Act provisions. In periods of extreme drought short-run needs to make water available for citizen use and food production may take precedent over the long-run species protection goals, an issue that will need to be addressed at the Federal level.

Another area of continued concern is linked to California agriculture's dependence on a reliable supply of agricultural labor. In a recent poll of California Grape and Tree Fruit League Board of Directors, immigration reform was rated the number one priority issue for 2009. The single biggest expense for these producers is labor costs. Since the fresh market is the first choice for most fruit producers, hand picking insures minimal damage to the fruit, insuring a greater share of the crop will meet the qualifications for selling in the fresh market. Farm labor is also critical to tree nut production, dairy operations and to a lesser extent in grain production. California producers, particularly grape, tree fruit and berry farmers, employ around 450,000 workers during peak harvest season and 300,000 in off peak periods. Some reports indicate that as much as 85 percent of this farm labor payroll is made up of undocumented workers. The development of a program to establish a legal and reliable agricultural workforce is critical to the California agricultural economy.

California producers have adopted farming practices that comply with most stringent standards for food safety in the world. Our dependence on foreign markets and reputation for high quality require it. Despite these efforts the difficulties associated with the existing programs and policies related to the detection and control of outbreaks of foodborne illness in the U.S. can result in substantial negative economic consequences for the agriculture industry. Most recently an outbreak of *Salmonella saintpaul* was initially attributable to fresh tomatoes consumption. Ultimately the outbreak strain of *Salmonella Saintpaul* was traced to Serrano peppers grown on a farm in Tamaulipas, Mexico. Not a single tomato linked to ill persons and randomly collected from the distribution chain in outbreak states were found to test positive for *Salmonella*. But the damage was done. Industry estimates put the losses to the tomato industry in excess of $100 million. In California retail sales of tomatoes were down more than 50 percent even after tomatoes had been cleared from suspicion. These events suggest the need for an examination of FDA programs and policies with a view toward discovering what can be done to prevent future unsubstantiated warnings and related market disruptions.

As mentioned earlier, the returns for many California agricultural products are highly dependent on export markets. However in some cases producers are subject to market disruptions that result from trade policy decisions over which they have no control. The recent canceling of a NAFTA cross-border program that gave Mexican truckers access to U.S. markets is a ready example. In retaliation Mexico has targeted a total of 36 agricultural products for increased import tariffs. Included in the 36 agricultural products targeted for tariffs are: onions, strawberries, cherries, pears, wine, almonds, juices and peanuts. Some will be taxed at 10–15 percent, some at 20 percent. Among the most disturbing for California producers is the intention to place a 45 percent tariff on imports of fresh grapes. Mexico is the second largest market for California fresh grape exports, accounting for over $49 million in 2008. Clearly this policy action can have negative effects on the growing market for California agricultural products in Mexico. In contrast Congressional inaction on pending trade agreements with Columbia, Panama and South Korea may prevent California and other U.S. producers from capitalizing on potential market opportunities. To provide a more competitive international market place for California and U.S. agricultural products will require Congressional action leading to the adoption of pending beneficial trade agreements, compliance with obligations under existing agreements and continued efforts to secure meaningful trade liberalization with increased agricultural market opportunities in a multilateral setting (Doha).

There are many other areas that need to be addressed such as infrastructure revitalization for roads, ports and rail; the development of programs designed to promote agricultural contributions to carbon sequestration; the role of biofuels; im-

provements in border security to prevent entrance of damaging foreign pests and diseases to name a few.

The agriculture community in California and our elected representatives will need to continue to work with our colleagues from other states and in other industries and interest groups to develop innovative policies and programs that address the issues discussed today. Identifying areas of concern and understanding the issues involved is a first step in that direction. Hopefully the information provided in this hearing has helped in that regard. At the end of the day we all need to work toward improving the system that can provide assistance to the resolution of immediate crises and establish the elements of a strategic pathway to a prosperous future for U.S. Agriculture and rural America.

Thank you again for arranging this public hearing to better understand the state of the agricultural economy and for allowing me to share my views of current issues facing California agricultural interests.

The CHAIRMAN. Well, thank you, Dr. Paggi. The largest agriculture producer has some real challenges. We all have challenges, but you are painting a pretty tough picture there. I hope we can do something to help.

I would just address this to all of you, to start off with the questions. You know, bankers look at farmers' participation in the farm programs, as they sit down and go over their program for the year, and the analysis and so on, and I am just curious what your thoughts might be. Do you anticipate bankers weighing in with, or even pushing producers on whether to remain in the Direct and Countercyclical Program, or sign up for the Average Crop Revenue Election Program? What are your thoughts on that? Anybody.

Dr. HARL. Just to be sure I understand, the traditional program or the new program, that they can sign up.

The CHAIRMAN. Yes.

Dr. HARL. For the first time, well, if we had perfect foresight, as perfect as our hindsight, in terms of what is going to happen to prices, that would be an easy one.

The CHAIRMAN. Yes.

Dr. HARL. I have been, a lot of the producers in Iowa have been saying I am going to sign up for the new program. I have been cautious. I have, in my testimony, a statement of disclosure that I am involved, with my wife, in owning farmland in Iowa, and we have share-rent leases, so we are as involved as our tenants are on this issue.

But I am so concerned about the commodity prices, going forward, that I am putting off that decision as long as I possibly can, and anyone who asks me, I am telling them the same thing, because we just don't know. But it can be costly, if we have a shift against us in commodity prices, which I fear could happen.

Philosophically, what we have in the Federal programs is a safety net, and we are beginning to change our philosophy a little bit out in the country that this is a way to maximize our income without looking at the basic nature of the program, which is to catch us from a freefall in a bad year or series of year, like we had from about 1998, when I was here, up through about 2005, when ethanol pushed us up into the stratosphere. That is unnatural. It is unusual to have that kind of thing happening.

So, I think we need to keep our eye on what is the basic purpose of Federal farm programs.

The CHAIRMAN. Thank you for that comment. You went right to the heart of what I was getting at. Anybody else?

Mr. DUMLER. My experience so far this year in Kansas is I don't think the lenders are pushing farmers one way or another. I think they are trying to figure out the programs just every bit as much as farmers are. And, as Dr. Harl noted, it is unknown right now.

I think, personally, in Kansas, it is a toss-up as far as which direction may be the right one to go, and I will tell farmers they will know in 2013 what the right decision was. So, at this point, it is that farmers and lenders are both in an information gathering stage at this moment, and putting off the decision, for the most part.

The CHAIRMAN. Okay. The chair recognizes Mr. Moran.

Mr. MORAN. Mr. Chairman, thank you very much. I want to try once again. Apparently, I didn't ask my question seriously enough to the Federal Reserve, but I am interested in someone's analysis as to the expectations for interest rates. While you have testified that at the moment, interest rates are low, debt service is not a significant problem for most farmers, there has to be a day of reckoning that is coming, based upon a number of factors, including Federal spending.

Mr. DUMLER. Right.

Mr. MORAN. Is there a prediction, an estimation of when this becomes a serious problem for agriculture?

Dr. HARL. My position has been we will eventually face enormous inflationary pressures. We will eventually face higher interest rates. What most of us don't know is when that is going to happen, and it really depends upon when things begin to turn, because as soon as the Federal Reserve sees that the economy is turning, my prediction is that they will shift their philosophy from trying to save us from a freefall to trying to control inflation. Because the 1970s are not totally lost on the building down in the flats.

I remember sitting with Mr. Volcker shortly after he became Chair of the Fed, and they slammed on the monetary brakes. So, agriculture has been through this. We know what happens, and we need to be very alert to this. And we should now, with low interest rates, be taking advantage of those low interest rates, although, in the long part of the yield curve, it is not as dramatic as it is on the short term money. I think that the safe thing to do, for farmers and others, is to try to lock in the longest terms they can get at the current cost of money, knowing that we are going to have inflation, because you just don't pour the kind of money into the economy without consequences. And we can pretty well predict what those consequences are.

Dr. ANGLE. Excuse me. Could I add a footnote. I think the earliest we can see is a turnaround in Q4 of 2009, but more likely, in 2010, and so, I don't think it is imminent. I don't think these efforts that are being made are going to give us a great deal of buoyancy this year, but it could happen as early as the fourth quarter of this year, I think. But nobody really knows. We are all trying to see around corners. And this is a difficult corner to see around.

Mr. MORAN. I see no one else jumping at the opportunity to answer my question. Projected percentage of farm income, someone mentioned this, and I want to make sure I understand it, and it may have been you, Mr. Dumler, I am not certain about projected

percentage of farm income that is coming from government programs. What is the trend?

Mr. DUMLER. The trend has definitely been down. Obviously, with the commodity prices, the programs that make payments based off of low market prices don't kick in. So, we went from levels in Kansas, looking at a 5 year average, 50 to 60 percent of net farm income coming from government payments down to 20 percent in 2007. I would expect numbers in 2008 would be very similar to that.

That includes, though, and you need to keep in mind, that includes actually all government payments, commodities and conservation payments in the data that we have. So, that may be, perhaps, a little overstating some of those values, but the trend has certainly been down the last couple of years.

Mr. MORAN. I don't know that anybody mentioned this, but I am interested in the percentage of farm income that is based upon exports.

Dr. HARL. Exports.

Mr. MORAN. Is that a number that anybody has, and do we know what the trend is there?

Dr. HARL. Well, exports have been growing, and the difficulty is, in trying to calculate how much of that increase is attributable, or should be attributable to the export activity, because of the way it works out in the markets. There is no question, but what our exports have been rising generally. I used to, in fact, I still have a slide that shows, going back about 40, 50 years, showing the trend, and it was up and down, but basically, we are moving up.

I think that one thing we need to be very cautious about here is the question of competitive position that we are in in the country. Most sectors of the U.S. economy are having difficulty because they are losing jobs, they are losing economic buoyancy abroad, because we are in a period when everyone is seeking the lowest cost place to produce. But we have an advantage in agriculture, in the sense that our soils are not mobile, and our climates are not mobile, and as long as they are not mobile, then we will probably be producing crops in the United States. They are not going to get outsourced like a lot of other things are.

Livestock is mobile, and livestock could move. And we are seeing a dramatic increase in livestock production in Romania, in Poland, in a lot of the Central and Eastern European countries. But generally speaking, livestock production is pretty tightly tethered to feed grains, and we have the advantage, of course, in feed grains, and probably will for some time.

So, when we take the very long view here, we can take comfort in the fact that we are a little different from most of the sectors. It is a very serious problem for almost every sector, including the service sector, because a friend of mine just had a knee surgery in India, and that means movement of a lot of value overseas rather than here. So, trade is good if your unit of observation is the globe. Trade is not so good if your unit of observation is Newton, Iowa, that lost the Maytag plant, and they are still recovering from it.

So, this is part of a much broader issue, as to where we are going in the world, and of course, we have one overarching objective, and that is to try to increase the level of harmony in the world, and

that is best done by raising people's incomes. And so, this is long term, but it is kind of a hard sell to someone who just lost their job.

Mr. MORAN. I describe that as trade is always good in the macro sense, but difficult to explain in the micro sense.

Dr. HARL. Exactly.

Mr. MORAN. My time has expired. I hope that, I want to give everybody a chance. We have votes soon, and I hope to be able to ask another round of questions if the votes haven't been called.

Mr. Chairman, thank you.

The CHAIRMAN. Mr. Marshall.

Mr. MARSHALL. Thank you, Mr. Chairman.

Just an observation, in light of Mr. Moran's questioning concerning interest rates. Some argue, at least, that our current circumstances are a good bit different than those in the 1970s. Yes, it is true that a huge amount of liquidity, hopefully, is being injected into the market by the Fed, by stimulus packages, *et cetera.* But that is in response to a massive contraction in the money supply that has occurred, and if managed appropriately, it may not lead to—it certainly does not inevitably lead to inflation. If the right kind of measures are taken, judgment is exercised, and the effect of this is to simply stop the contraction, and then gradually build it back up as the economy builds back up. And if it occurs, if there is a harmonious relationship between our efforts where the money supply is concerned and the economy, then we ought to be able to avoid deflation and inflation, both those things. There are plenty of people who are saying that now.

My question, though, is, it has to do with Dr. Angle's, Dean Angle's testimony. I am struck, in your testimony, the written testimony, some of which you read to us in your opening remarks. You say that it is just a given, "crystal clear" is the term that you use, that rising population will lead to food production having to double by the year 2050, and arable land is going to decrease. We have climate change issues that you discussed in your piece, and the solution to, getting to, despite the smaller available land, getting to doubling the food production by 2050 is going to be increase as a yield, as a result largely of technological improvements.

And I guess my question is this. Are any of you aware of what you would view as credible agricultural economists who are pessimistic about the ability of technology, scientific advances in crop yields, to keep up with the need at this point? I have read a few pieces that, where people who purport to be experts are saying gosh, the huge technological improvements that we have seen, starting in the 1950s to the present day, are slowing down, and as they look at how things are likely to evolve, we are not going to see that kind of improvement in the future. So, it is unrealistic to think that somehow, we are going to get out of this problem, well, it would be a problem if, in fact, we can't keep up food production in light of population.

Any of you know of credible economists, this reminds me of somebody who doesn't have expertise in this area, it sort of reminds me of the argument over global warming. And if the mass of scientists who are experts in the area are saying yes, we have a problem with this, and a small number are saying no, we don't, policymakers like

me sort of feel like we better go with the mass here, because the consequences of being wrong are pretty significant. And so, maybe we need to take some reasonable measures to try to address the problem.

I guess the same thing is true here. Are there credible agricultural economists out there who say we are not going to be able to keep up?

Dr. ANGLE. Let me discuss this historically. Fifty years ago, there were the same, "type" of economists saying that food production could never keep up with the increase in population, Malthus and some of the other experts back at that time were predicting in the year 2000, that we would be looking at mass starvation on a global basis. That didn't happen. Technology is what kept up with the growth in population, and our ability to double food production on a fairly regular basis.

The same type of people are saying those same things now. My argument against that is that while the easy things have been done in agriculture, our advances in technology, genetic engineering, improved understanding of genetics, both plants and animals, has given us tools that did not exist 50 years ago. We have the opportunity to make incredible advances over the next 50 years. Again, the easy things were done 50 years ago. The hard things are left, but we have some tools in our tool belt now that did not exist 50 years ago, and so——

Mr. MARSHALL. If I could interrupt. You said—it is the same, you are saying, it is the same type of person, the generally pessimistic——

Dr. ANGLE. I would call them more futurists than true economists, the people who look at some of these macro trends that were making these predictions 50 years ago. Those same type of people are still out there today, making predictions.

Mr. MARSHALL. So, what you are saying, I guess, in response to my question, is that you are unaware of what you would view as credible agricultural economist, experts in the field of food production, who themselves believe that we are not really going to be able to increase crop yields to the degree we need to, in order to meet the challenge. You are just not aware of people like that.

Anybody on the panel aware of folks like that? The industry is pretty much unanimous, you experts are pretty much unanimous that we are going to be able to move forward?

Dr. HARL. It is very difficult to get a group of economists to agree on much of anything, but I would say that the majority view is that this does not pose an earthshaking problem for us. And I think there are a number of reasons for that. There is a lot of potential supply response. We have not really——

Mr. MARSHALL. I have to interrupt for a second here. I am really just sort of interested, my time has expired, we are going to have votes, there is another person who wants to ask questions. I am interested in not the details, as much as I am whether or not there is a substantial minority view here.

You said just a minute ago, you just said in your opening remarks responding, "that the majority of." Had you not spoken, had we just left with Dr. Angle's remarks and nobody else, I would have said not a majority, it is like a super-majority. There is just

nobody out there who is viewed as a credible agricultural economist that would think we are not going to be able to keep up. That is really the issue for me. Is there a real substantial view among credible agricultural economists that we are not going to be able to keep up? Dr. Harl.

Dr. HARL. I would have to say that the majority view is clearly that that is not a huge problem facing us, that we will——

Mr. MARSHALL. Fifty-one percent say it is not a huge problem, 49 percent say it is an overwhelming problem. From a policymakers' perspective, that is something for us to worry about.

Dr. HARL. I have never seen agricultural economists lined up in a row, and then, to see how many were over on one side of the line or on the other side of the line, but it is not the view of the profession, as I would put it, that this is a huge problem. And part of the reason is, we all lived through the last 80 years, and those who argued in the 1930s that we had a problem on our hands have been proved pretty much wrong over the years. As I started to say, there is a huge supply response we could exploit here if we have higher commodity prices. And the technology is going to be very significant, too.

Mr. MARSHALL. Thank you all for your testimony. My time has expired.

The CHAIRMAN. Thank you. I now recognize, my colleague from Iowa, Mr. King.

Mr. KING. Thank you, Mr. Chairman, and I do thank all the witnesses, and Mr. Dumler, I recall your testimony down there in the rain-drenched land of the purple tie, long ago. I tease you a little bit as I do my colleague here, Mr. Moran, for that reason, to catch Kansas while it was raining.

But as I listened to all the testimony here, I want to just make the comment that the Malthusian's have always been wrong. We have always risen to all of those challenges, and that is a thread that I think, came from the witnesses. And in the time that I have, I have a lot of questions, but I would like to take this opportunity to direct my first question to Dr. Harl, and that is, what we have seen happen, and especially in the feed grains commodities, and in our part of the country, is that grain prices have been strong. The demand for countercyclicals and LDPs have been essentially eliminated for at least a couple of those crop years.

In the middle of that, we have a little bit of EQIP funding that has been going to our livestock producers primarily. If we were to lose the funding for direct payments, would there be anything that existed in Federal policy that would provide an incentive for soil conservation, protecting our water quality, and preserving the productivity of our soil?

Dr. HARL. Well, as long as the prices stay high enough, so that we don't have countercyclical and we don't have market assistance benefits, because we have the cross compliance rules that really are the stick to keep people doing the right thing. So, the loss of direct payments would mean that there would be less penalty for doing the things that people might be inclined to do.

I guess I would be, to be fair, I would have to say that most of the people I know aren't terribly willing to tear up terraces and that type of thing, even with high prices. There is a great steward-

ship feeling among farmers and landowners as well. So, I have argued against direct payments from a public relations point of view, and when farmers are having good commodity prices, I think it is difficult to justify to a person who sees in the papers payments of significant size going out to individuals.

Mr. KING. What if we just renamed them conservation compliance payments, then? Would that be more accurate?

Dr. HARL. That would be—I really think we should start working on something to make these closer tied, more closely tied to those things that the public believes are really important. We have data back many years showing 60 to 65 percent of the population will be supportive of programs to help family farmers, if they think they are needed, or it is serving a good purpose. And this is what we have to do here is to reinvent direct payments in another form.

Mr. KING. You know, if I might pick up on that, Dr. Harl, and I appreciate that, because I think we go to the same place eventually. And the culture that is there for land stewardship, I believe, is something that has been built, because we have had incentives in place, and I, of course, have spent a lot of my life engaged in that, and it is one of the reasons my focus comes on that. And I am concerned about losing the direct payment component of this, because it remains a last hook if countercyclicals and LDPs would no longer be demanded because of market prices.

But I wanted to take you to another question. And that is, I just put some numbers together here as I was listening to the testimony, and it really goes to the food *versus* fuel argument. And in the 2007 crop, we raised more corn than ever before, and that would be about 13.1 billion bushels, and we exported more corn than ever before, that would be 2.5 billion. We committed about 3 billion bushels to ethanol production out of that crop. But then, I would also calculate that, make your argument, whether you add a third of it back in or half of it back in, but since half of the waste is also lost in feed, I would argue you would have had half of that back in, mostly in the feed value, in the form of DDGs. So, I end up with a net domestic consumption out of the 2007 crop for corn of 9.1 billion bushels, effectively.

And when I look at that, and I look at the average that has been available for domestic consumption over the previous years and the decade, that is 7.5. So, we really had 1.6 billion more bushels of corn available out of the 2007 crop for domestic consumption than we had seen in any other year of the decade. How could we then have the demand for fuel drive up food prices as high as the people that are on that side of the argument say? Dr. Harl.

Dr. HARL. The issue of the relationship of the price of corn and soybeans, and to a degree wheat, to the price of food, is a very complex issue, and to understand that, you have to look at the structure of the segments of the supply chain. Most of the producers are in perfect competition, and before we see livestock, the corn that goes into livestock production, cause an increase in, beyond the farm gate price, you have to have forces squeezing the producer to reduce supply, and that takes a while. And I was questioning, in the articles I was writing over the last several months, that livestock production isn't forcing up prices.

Now, it is a little different story where corn is used directly in production. But you move one step up the processing side, and that is not as competitive. That is not perfect competition, and the retail side in the stores, that is not perfect competition, either. And so, where we have seen a great deal of concentration occur, they are always slower to drop their prices when the price of raw materials goes down, and they are very quick to raise their prices. That is really the reason why I consider the structure question in agriculture one of the most important, going forward, of any of our policy issues.

I think the public is best served when we have as much competition as we possibly can get, not only in the production side, but in the processing and every other step. And so, I am strongly supportive of everything that will make the price system, the market system work better.

Mr. KING. Well, thank you Dr. Harl, and just if I could conclude with a question, thank you, Mr. Chairman, for the deference. As I listen to this, I also am aware that during the same period of time, this would be about a little over a year ago, we saw food prices go up about 4.9 percent, and we saw energy prices go up about 18 percent. So, I would submit that at least the ethanol and the market had to lower the, keep the price of gas from inflating as it might have otherwise. But I would just like to conclude with a question to Dr. Angle, and that would be that if we are concerned about meeting these goals of doubling food production by 2050, and concerned about water and the things that you talked about, then how do we justify, then, subsidizing non-food commodities such as cotton?

Dr. ANGLE. Well, it is certainly a local issue. Cotton is a very important part of the Georgia economy, and despite what we heard recently, and despite some of the programs, we are starting to see an increase in the desire to plant cotton in Georgia and neighboring states. You know, I don't feel qualified to give you any better answer.

Mr. KING. Can I just summarize that.

Dr. ANGLE. I understand.

Mr. KING. It becomes a local economics question, and parochial.

Dr. ANGLE. Yes, sir.

Mr. KING. And I really shouldn't have been presented that question to you. I must have gotten up on the wrong side of the bed this morning. So, I thank you all for your testimony very much. It is very engaging and enlightening, and I appreciate it, Mr. Chairman. I would be happy to yield back.

The CHAIRMAN. We have been called for a vote. However, we can take a couple of minutes, yet. And so, I would recognize Mr. Moran for his last question, and any closing remarks he would like to make as the Ranking Member.

Mr. MORAN. I thank the Chairman, and I will try to avoid asking questions, because there is a tendency out there to have long answers, at least by some of the witnesses.

And Dr. Harl, I do appreciate very much what you had to say about the political nature of direct payments. I am one who believes they are a very important component of the safety net that we provided farmers, which came about in the 2000 Farm Bill, that

so-called three-legged stool. I understand the difficulty in explaining why a payment would be made when commodity prices may be higher than they are historically. But I certainly would encourage you to make the case, based upon what you said subsequent to that, about the role that the market should play in making decisions, and those direct payments are the least trade distorting, and they are the most market oriented, and at a time when commodity prices are what they are, and there is no other payment being made. But, input costs, again, we don't take into account, except in a small way, in regard to those revenue payments, what the cost is of production. And those direct payments are a very important safety net at the moment, when fertilizer, fuel, and natural gas matter. And I would love to have you talking about yes, it is difficult to explain this politically, but they matter.

And I also wanted to just ask, or comment to Mr. Dumler about I wish we had had more time to explore the circumstances that our livestock and dairy industry are facing in Kansas and across the country. You, Dr. Paggi, mentioned that in California, it is a huge issue, with tremendous consequences, and then, it spills over into the grain side. It also creates difficulties when it comes to ethanol and biofuels, and kind of the consequences to our livestock and dairymen. On one hand, when we promote the use of grain for fuel purposes, yet, at a time in which livestock and dairymen have such dire circumstances that they face.

I have spent some time in California with producers, specialty crops, cotton, rice. Your university gets great commendation from the producers that you serve in California, and I appreciate very much the relationship that you apparently have in promoting agriculture.

Dr. Angle, this Subcommittee has spent time in Georgia. I look forward to working with you in regard to the issues that matter in the South. And I thank the Chairman for allowing me at least, not asking questions, but to express an opinion.

The CHAIRMAN. Well, we appreciate that, and we have had the second call, so we are going to bring this to a close. I just want to thank the panel for giving us the time you have given us.

I think you have told us pretty clearly that it is a challenging time, and we need to stay tuned in, and I can't appreciate you bringing your expertise and coming to use, can't say it strong enough. Please stay in touch with us. We will probably stay in touch with you.

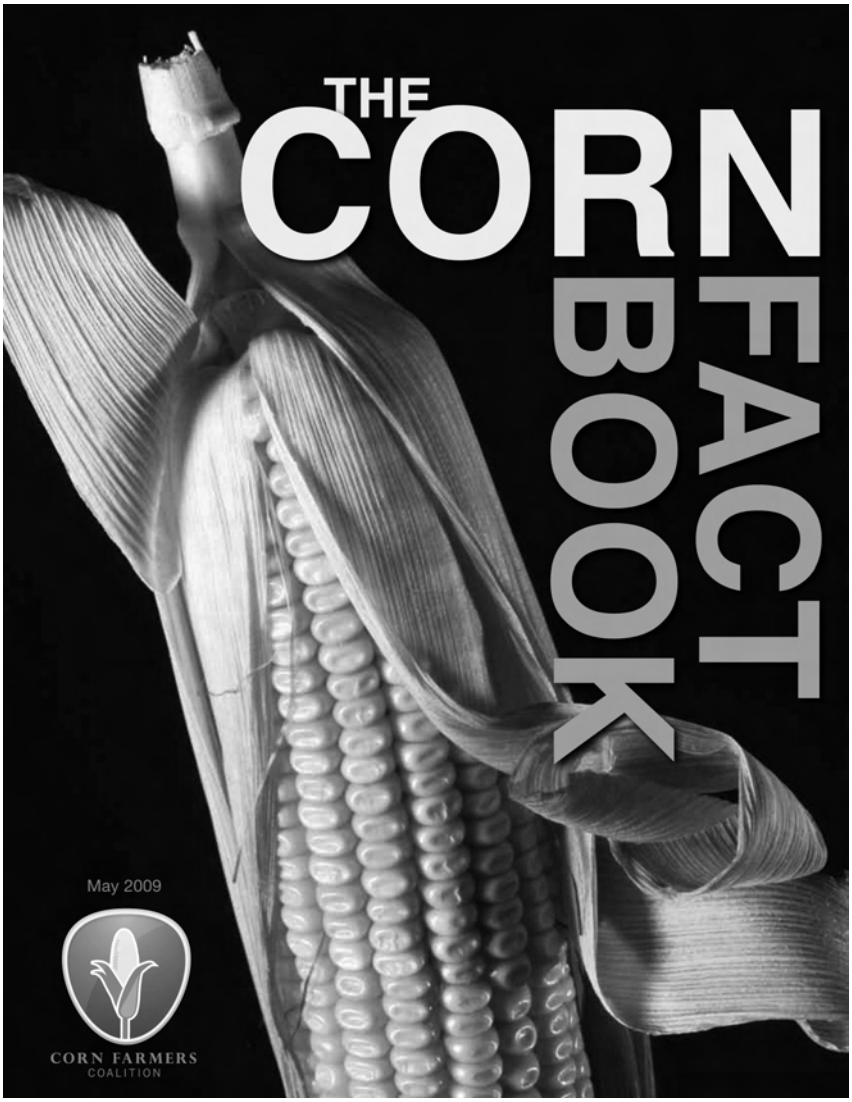
And so I am going to bring this a close, and under the rules of the Committee, the record of today's hearing will remain open for 10 calendar days to receive additional material and supplementary written responses from the witnesses to any questions posed by a Member.

The hearing of this Subcommittee is now adjourned.

[Whereupon, at 1:35 p.m., the Subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

SUBMITTED REPORT OF NATIONAL CORN GROWERS AND CORN FARMERS COALITION



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Executive Summary

Thanks to tech-savvy, innovative farmers, there is plenty of corn to eat, make ethanol, feed cattle and even export a big piece of America's largest crop.

In 2008, corn prices briefly doubled as a new type of customer — the ethanol plants that make automobile fuel from corn — began using more corn. Meanwhile people worried that floods in the Midwest would crimp the corn crop.

Corn's other customers started worrying about scarcities. And the resulting high prices pinched profits for these older, traditional customers for corn, like beef producers and food-makers. Used to decades of inexpensive, plentiful corn, these customers complained about Congress and the federal government promoting ethanol.

Their argument: If this new customer was going to use so much corn, the world had to choose between corn for food and corn for fuel; there simply wasn't enough to do both.

A Bogus Argument, a False Choice

Well, the debate, known by the short-hand "food versus fuel," is over. And, it turns out, we *don't* have to choose. There is plenty of corn to eat and plenty for making ethanol and plenty for feeding cattle and plenty more to export and still more to make chemicals and fabric. After peaking briefly in July 2008 at more than $8 a bushel, prices slid to less than $4 by the end of the year and hovered there through the first quarter of 2009.

What happened? American corn growers — mostly small family farmers — produced the second-largest harvest ever in 2008, more than 12 billion bushels. Yields — bushels produced per acre — rose too. In fact, thanks to new technology, yields are likely to double in the next 25 years.

Huge combines guided by high-tech global positioning systems, now pick the corn and harvest kernels from the cobs right in the field — a century's worth of technology removed from farmers in horse-drawn carts who plucked each ear by hand.

Best of Both Worlds: More Corn, Cleaner Environment

Meanwhile, the environmental impact of growing corn declines every year:

- Biotechnology makes corn resistant to insects, which means less pesticides.
- Farmers grow five times as much corn as they did in the 1930s — on 20 percent less land.
- Farmers manage their fields differently, using reduced- or no-till management systems, which protects soil from erosion.
- And farmers today produce 70 percent more corn per pound of fertilizer than as recently as the 1970s.

Little of this would matter if we were talking about kale or broccoli. But corn is by far America's biggest crop, and the world's, too, bigger than wheat or rice or soybeans. Corn is a staple food in the Americas and much of Africa. Corn is one of the cornerstones on which our entire food system rests.

Surprise! Most of the Corn Grown Is Not for You to Eat

Yet few people realize only about 1 percent of the crop is the sweet corn that we buy frozen, canned or on the cob at the grocery store. The vast majority of the crop is instead commercial "field corn" used for other purposes.

Half the U.S. crop goes to feed cattle, pigs and poultry. Another quarter goes to ethanol, and 20 percent is exported. The rest goes to make food ingredients, chemicals, fabrics and plastic.

For years farmers have quietly grown all the corn the country needs, with little fanfare and little excitement but for the occasional natural disaster.

That changed in late 2007 when Congress increased the amount of ethanol and other biofuels it wanted blended into the nation's fuel supply to 36 billion gallons by the year 2022. That will equal 15 percent of the gas we use today — leading to less imported oil, greater national security and less pollution from gasoline. It has brought both kudos and criticisms to farmers.

Corn's Customers Complain about Competition

In 2008, sky-high oil prices pushed food prices to levels not seen in modern times. The food manufacturers didn't like it; the livestock feeding operations, accustomed to cheap corn, didn't like it. And the oil companies, feeling

threatened by ethanol and trying to divert attention from their profits while their customers got creamed at the gas pump, didn't like it, either.

But, in fact corn prices haven't even kept up with inflation over the years. Below-cost feed saved the broiler-chicken industry more than $11 billion and the pork industry $8.5 billion between 1997 and 2005, Tufts University economists found.

The old corn customers cooked up a slick, expensive public-relations campaign to blame this new customer, ethanol, for driving up the price of corn and raising food prices. The country, they contended, had to choose between food and fuel when it came to corn.

As we now see, that was nonsense. It wasn't long last year before corn fell back to around $4 a bushel as corn farmers kept the country and the world plentifully supplied with corn.

A New Coalition, a New Corn Story

Now that argument is over, our group, a coalition of corn farmers from 10 states, has allied with our trade association, the National Corn Growers Association, to highlight the contributions of today's high-tech and innovative corn farmers.

We are also working to reform and modernize the Farm Bill so it costs taxpayers less and provides an adequate safety net for the crucial agriculture industry.

And finally, we're educating legislators, the media and the public about corn. Yes, in the great scheme of things, in the midst of an economic meltdown and the beginnings of a new presidency, the problems of the corn industry might seem to rank way down the ladder.

Yet to think that way is shortsighted. If people know how important corn is to our food system, our economy and even our national security, and could understand the market a little better, we'd be less likely to have the kind of silly debate we had last year over food versus fuel. Instead let's not let this distract us from debating more important issues such as reforming the Farm Bill.

For there is plenty of corn to go around, and that is not going to change.

Introduction

Corn touches our lives every day. We:

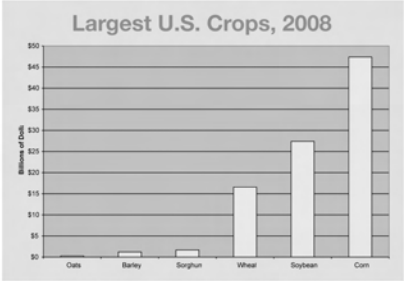
- eat or drink something made from corn or corn products, such as sweeteners or starch;
- eat beef, pork or chicken fed with corn;
- drive cars powered partly by ethanol made from corn;
- open boxes whose contents are protected by biodegradable plastic packaging made from corn;
- use fabrics, plywood and even pharmaceuticals made from corn.

Thousands of foods in your supermarket contain corn in some form — high-fructose syrup in the soft drinks, corn-fed fish or beef, caramel-flavored candy, canned fruit and ketchup.

Corn is a staple of American agriculture and a cornerstone of our economy. Yet few people realize that only a relatively tiny fraction of the crop goes into food. Far more is exported, fed to animals or made into ethanol.

Corn is America's biggest crop and the world's, too, bigger than wheat or rice or soy beans. Corn is a staple food in the Americas and much of Africa.

Because it pops up in so many places, it's hardly surprising that corn is news. What we want to do with this book is bring out the facts about corn in a straightforward, unvarnished manner in order to put the news in perspective.



Source: U.S. Dept. of Agriculture, National Agricultural Statistics Service

Here are the issues:

Thanks to technology, it takes *less* fertilizer and pesticide every year to grow more corn, the definition of a sustainable industry. But environmentalists worry large-scale corn farming puts unsustainable amounts of fertilizer and pesticides into the environment. The facts you will find in this publication show farmers are in fact good stewards of their land. They must be, since it is also their home and the source of their livelihood.

Well-meaning people worry that making ethanol is using so much corn that it is contributing to world hunger. But consider this fact: We grow enough corn in this country to export all the corn the rest of the world wants from us *and* make ethanol, feed people and animals, make biodegradable plastics and all the rest — and still have corn left over for emergencies.

And when speculators bid up corn prices, doubling them briefly in 2008, some not-so-well-meaning people, such as oil companies and grocery manufacturers, spotted an opportunity to blame ethanol. The reasons: Ethanol is a competitive threat to the oil companies; and the grocery manufacturers claimed a supposed shortage of corn meant consumers would have to pay more for food.

We now know that, despite their complaints, these industries were actually enjoying record profits. It turned out that the panic over the supply of corn in the summer of 2008 and the resulting spike in price was only temporary; there was in fact plenty to make ethanol, food and everything else that comes from an ear of corn. Despite the 2008 corn crop being the second-largest on record and corn prices falling back to normal, food prices have yet to come down.

The main culprit behind higher food prices turned out to be — no surprise — higher oil prices, which drove up production and transportation costs. The cost of corn, according to the federal government, is such a minimal part of the cost of making food as to be almost negligible.

Just the Facts, Please

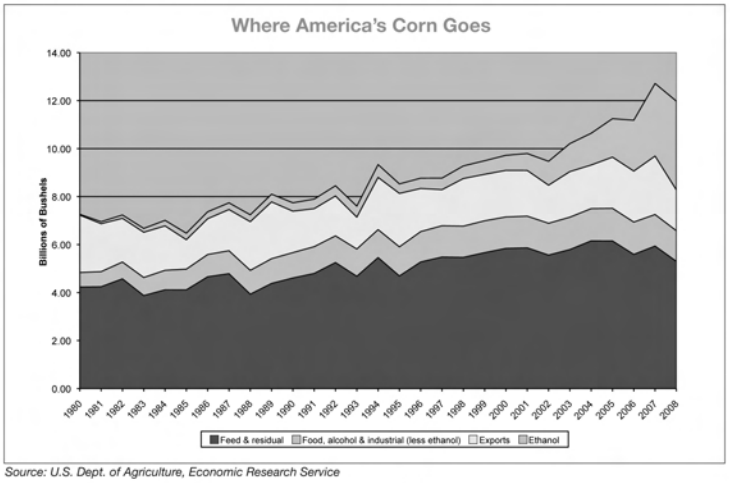
Corn farmers are not used to this kind of controversy. For years we've quietly grown all the corn the country and the world needs, with little fanfare and little excitement except for the occasional natural disaster.

We have, admittedly, a bias in publishing this fact book. We are corn farmers. But we have compiled facts and figures from places like the federal government and respected universities.

All but ***1%*** of the corn America produces is ***field corn.***

Corn is our largest crop because it is also one of our most versatile. All but 1 percent of the corn America produces is *field corn* — industrial corn, if you will, almost half of which goes to feed cows, pigs and chickens, and another quarter of which goes to make ethanol. We export almost another quarter,

and much of the rest goes to making chemicals, fibers and food additives such as sweeteners. The miniscule amount remaining is popcorn or the vegetable, known as *sweet corn*, which we actually eat as corn on the cob or in succotash. Yet that's what most people think of when they talk about corn.



Source: U.S. Dept. of Agriculture, Economic Research Service

The corn industry is run by thousands of small farmers. It's not a huge business in dollars: The corn that farmers harvested in 2008 was worth $52 billion. (The restaurant industry alone will do 10 times that much business.)

But American corn farmers are among the most productive in the world; they grow more than two-fifths of the world's corn.

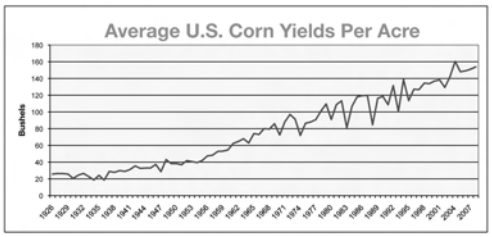
The corn that farmers harvested in 2008 was worth **$52 billion.**

Corn is a stable economic engine when many industries are struggling. Corn keeps Texas feedlots, teeming with cattle, humming; keeps food prices down and offers Americans for the first time in our history a broad choice of affordable beef and chicken, pork, eggs and dairy products; and keeps the docks in Los Angeles busy winching big metal containers of corn onto ships headed for Colombia and Japan and Turkey.

Corn: A Short History

Corn has come a long way since the Mayans of Mexico first learned to domesticate the tall tropical grass they called maize about 9,000 years or so ago.

By the time Columbus arrived in the Americas in 1492, corn had spread and adapted to climates from the Andes to Canada.



Source: U.S. Dept. of Agriculture, Economic Research Service

In our country's early days, Native Americans taught the Pilgrims to grow corn, which helped keep the colonists of the Plymouth Colony from starving. Corn became a staple because it grew faster and was hardier than any other food crop.

Before long, corn was an important early American crop, used to make whisky, corn bread, fritters, hush puppies, mixed with lima beans to make succotash, grits, hominy, chowders, puddings and the rest.

By 1900 tractors and other mechanized agricultural equipment had appeared, and corn production began to soar. In the 1920s, researchers began to crossbreed corn into hybrids that produced far more corn from the same number of acres.

> These days, farmers ***grow five times*** as much corn as they did in the 1930s — ***on 20% less land.***

The big animal feedlots came in the 1950s. By the 1960s, chemists were finding myriad new uses for corn, like making degradable plastics.

These days, farmers grow five times as much corn as they did in the 1930s — on 20 percent less land.

And the average yield per acre is expected to double in the next 25 years thanks to new technologies and more efficient farming.

Huge combines now harvest kernels from the cobs right in the field — a century's worth of technology removed from the farmers in horse-drawn carts who plucked each ear by hand through most of history. Soon these combines will separate the kernels and cobs and unload them separately so the cobs can be used for making fuel.

Meanwhile, the impact of growing corn on the environment declines every year.

Today, farmers produce **70% more corn** per pound of fertilizer than they did ***35 years ago.***

Today, farmers produce 70 percent more corn per pound of fertilizer than they did 35 years ago. New high-tech equipment puts fertilizer directly over the plants' roots instead of spreading it on the whole field. Additionally, seed technologies are constantly improving corn's fertilizer-use efficiency.

"No-till" cultivation, increasingly common, reduces soil erosion. It also lets farmers skip the step of plowing up old, dead stalks, which saves diesel fuel and builds up organic fertilizer in the soil.

Where All That Corn Goes

Through all these changes and all the new uses for corn, what we use corn for has remained largely unchanged for the last century. Most goes to animal feed.

It's faster and cheaper to fatten cattle from 800 pounds to 1,300 pounds on a diet that includes corn than it is to feed them exclusively on grass.

But it is demand for ethanol that is growing fastest. Ethanol production jumped six-fold from 1.4 billion gallons to 9 billion in the last decade.

Spurring this growth is ethanol's role in replacing the toxic gasoline additive MTBE and a congressional push for more domestic, renewable fuel. In 2007, Congress passed legislation calling for 36 billion gallons of ethanol and other biofuels to be blended into the country's gasoline supply by the year 2022. That equals 15 percent of the gas we use now and would mean less imported oil, greater national security and less pollution from gasoline.

This major commitment to ethanol got the attention of other customers for corn.

Worried about floods in the Midwest and fearing a shortage from all this new demand for ethanol, commodities brokers bid up corn prices to a record and unsustainable level for a short time in 2008.

That didn't sit well with corn customers, who have been used to relatively cheap corn for decades. Corn prices rose by only a factor of three since 1949, while oil prices jumped 37 times.

As sky-high oil prices pushed food prices to levels not seen in modern times, groups including the grocery manufacturers, the feedlots and oil companies tried through a slick public-relations campaign to shift the blame for high costs to ethanol while they enjoyed record profits.

These industries were so upset because they had become used to decades of buying corn at below what it costs farmers to grow it. In fact, corn prices haven't even kept up with inflation. For example, below-cost feed saved the broiler-chicken industry more than $11 billion and the pork industry $8.5 billion between 1997 and 2005, a study by economists at Tufts University found.

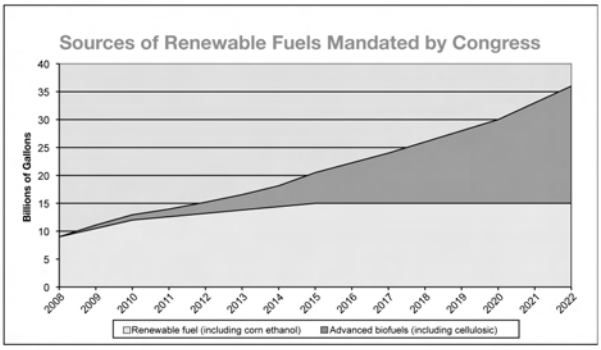
According to the Daily Livestock Report from the Chicago Mercantile Exchange in 2007, for instance, "pork producers are likely in the best financial shape ever."

Taking the Starch Out of Corn's Detractors

The truth is that when the price of corn rises, very little is passed on to grocery shoppers. Only 19 cents of our food dollar goes to farmers, and less than a nickel's worth to corn farmers, according to the federal Agriculture Department. Furthermore, the corn used for ethanol is industrial-use field corn, not the sweet corn grown for human consumption.

And, in fact, if you needed further proof that ethanol and corn weren't behind the rise in food prices, consider this: As corn prices fell back to normal by the fall of 2008, food prices continued to rise faster than usual.

The majority of that increase in food prices continues to come from record-



Source: Renewable Fuels Association

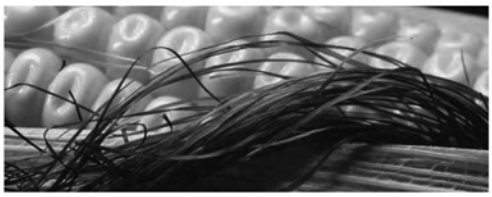
setting energy costs and stronger global demand for food; increased U.S. agricultural exports resulting from stronger demand and a weaker dollar; and weather-related production problems in some areas of the world, according to the Agriculture Department.

Only 19¢ of our food dollar goes to farmers, and **less than a nickel's worth** to **corn farmers.**

The fact is that there is plenty of corn to go around. American corn growers — almost 90 percent small family farmers — produced more than 12 billion bushels in 2008, the second-largest harvest on record. In 2008, after meeting all the needs for corn, there were still 1.7 billion bushels to put away against a rainy day.

And as the technology for making renewable fuels advances, demand for corn will level off. About half the renewable fuel that Congress mandated in 2007 must eventually come from somewhere other than field corn — weeds, refuse, switch grass or corn cobs, for instance. However, without corn to prime the ethanol pump and create a market, these other fledging fuel sources might never reach the mass-production stage.

While ethanol is the hot topic these days, corn has a bigger story to tell. In this fact book, a coalition of corn farmers in 10 states and the National Corn Growers Association bring you a straightforward look at corn, one of the nation's few growing businesses amidst the recession that began in late 2007.

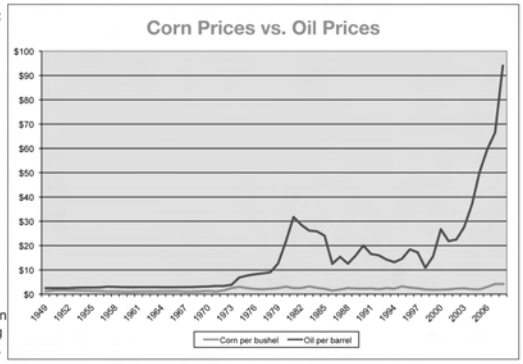


Chapter One: The Uses of Corn

Corn prices haven't risen much for 60 years. The $1.24 that farmers were paid for a bushel corn in 1949 had risen only by a factor of three to hit just $4.20 by 2008 while oil rose 37 times. Inexpensive corn made it attractive to feed to animals and its abundance meant there was enough to use for making non-traditional products, from biodegradable packing peanuts to fabric.

Let's look at how that happened:

As with other crops, corn harvests didn't increase much in the early years of the country. Farm implements like plows were powered by horse power — real horses, that is. There often weren't enough hands to plant and harvest a lot of corn. And yields were small because, before modern seed companies, farmers had only their own corn to choose from in selecting the best genetic traits.



As yields exploded in the 1950s, a flood of cheap corn came on the market. Most of this new corn went to feed animals, stimulating growth in the production of beef, pork and chicken.

In 1972, the U.S. sold a huge amount of wheat to the former Soviet Union and, with bad weather in the Farm Belt, triggered high prices and a food-shortage scare far worse than the contrived corn shortage that drove up prices in the summer of 2008. By 1973, housewives were even out protesting high prices in front of supermarkets.

The federal farm program began to change as the floor under the price of corn and other crops was removed. Farmers would still be reimbursed the difference between what they sold their corn for and the target price the government set but, without the floor, corn prices dropped, benefiting

companies that process corn into food and industrial products.

From then on, as corn got cheaper, farmers would have to grow more and more just to break even every year. Finding new uses for that corn started as an economic imperative for farmers but has led to creating new businesses and a place for corn as a strategic national asset.

Despite 2008's temporary run-up, corn prices lag inflation in terms of real dollars. Even at its record prices in July 2008, says the international investment bank Barclays Capital, corn was still 40 percent below its inflation-adjusted peak in 1974. If corn prices were rising as fast as oil, a bushel would sell for $13.50 today instead of around $3.50.

> If ***corn prices*** were rising as fast as ***oil,*** a bushel would sell for ***$13.50*** today instead of around ***$3.50.***

Making Blouses from Corn

While still a relatively small business, making non-food products like clothes, plastics and other products is one of corn's fastest-growing markets. Making something other than food out of plants has been around a long time. However, with the rise of the oil industry, it was cheaper and easier to make products like plastic from petroleum.

But in the 1970s, during the first Arab oil embargo, oil got expensive. And people began to worry about the environment. The notion of using biotechnology to convert renewable, biodegradable agricultural products into industrial use on a large scale blossomed. Production of ethanol and other products increased.

The key step is converting a carbohydrate like corn starch to a chemical or usable fiber with biological catalysts such as enzymes and microorganisms. The result is a growing array of environmentally friendly products in health care, food and manufacturing based on corn-based sugars and starches.

A good example is polylactic acid, used in synthetic fibers for clothes, bedding, carpeting and in biodegradable plastics. The U.S. churns out as much as 80 million pounds of plastic a year, most of which is now made from petroleum products. Plastic made from corn is more environmentally friendly, is homegrown and clearly there is a huge market. Overseas markets such as Japan and Taiwan are major customer for these degradable products because they can be composted and removed from the waste destined for landfills, which are in short supply.

Another benefit: These industrial processes, including making ethanol, also create a high-protein animal feed known as distillers grains, too.

The National Corn Growers Association encourages innovative technology at a biannual forum of leading scientists called the Corn Utilization and Technology Conference, which works on finding new ways to use corn.

Farmers envision a day when these new technologies will create factories in the fields outside small towns and rural neighborhoods, creating good jobs and reversing the slow decline of many of these places.

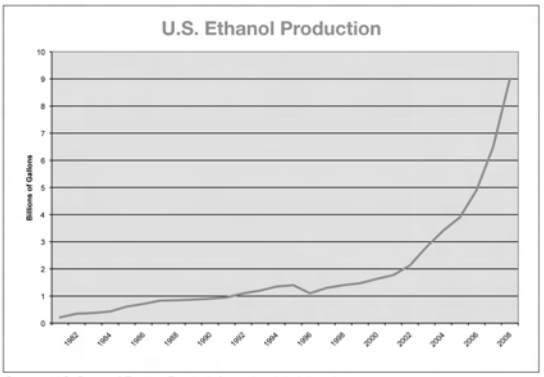
Ethanol: the Corn in Your Gas Tank

Ethanol now uses a quarter of American corn, second only to animal feed. Because both the feed and export markets are relatively flat, ethanol is taking up the slack.

And ethanol is a clean, renewable fuel that is entirely domestic. Imagine, if you will, a U.S. capable of producing all the fuel it needs from a renewable, environmentally friendly resource within its own borders. It won't happen tomorrow, of course. But ethanol is a good start; is widely available now, unlike other renewable fuels; and bigger and better technologies are coming.

Ethanol, also called ethyl alcohol, is a flammable, non-toxic, colorless, liquid.

Fermenting sugar into alcohol for drinking was one of the first chemical processes our ancestors discovered.



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

In fact, Henry Ford's 1908 Model T was one of the first flex-fuel vehicles; it could run on ethanol or gasoline.

After the first Earth Day in 1970 and the Arab oil embargo of 1973, Americans started to worry about the environment as well as fuel prices and supply. A handful of companies began churning out small batches of ethanol again.

In 2005 Congress passed the Renewable Fuels Standard in the Energy Act of 2005, which set targets for the amount of ethanol to be blended into the nation's gasoline supply.

Ethanol production soared to 6.5 billion gallons in 2007. Ethanol companies grew relatively large and even sold stock to the public.

In 2007, Congress raised the amount of ethanol it wants the country to use to 36 billion gallons by little more than a dozen years from now, in 2022. While 21 billion gallons of that must eventually be made from cellulosic materials — such as corn cobs, wood chips or grasses — the law has been instrumental in boosting demand for corn ethanol.

By 2008, more than 160 biorefineries were in action in America, bringing a boost to rural areas around the Midwest.

The law's purpose, it says, is to "move the United States toward greater energy independence and security, to increase the production of clean renewable fuels, to protect consumers, to increase the efficiency of products, buildings, and vehicles, to promote research on and deploy greenhouse gas capture and storage options, and to improve the energy performance of the federal government…"

The Energy Bill, however, had two unintended consequences. First, after floods hit the Midwest in 2008, speculators betting on a shortage ran up corn prices, bumping a bushel from around $4 to $8. That increased costs for corn customers.

And after Congress asked producers for yet more ethanol, the oil companies also realized they had a significant challenge on their hands: Ethanol is already 7 percent of the fuel we put in our cars and trucks. In fact, by the end of 2008, the amount of ethanol we were producing monthly nearly equaled the amount of gasoline we refined from all the oil we imported from Saudi Arabia.

When oil prices doubled in 2008, ethanol helped keep prices at the pump down, saving the average American family $500 a year, according to a study by the Renewable Fuels Association using government statistics.

All of a sudden, corn was controversial. The food-makers launched a slick, expensive campaign against corn and ethanol with oil companies cheering them on — a campaign based on misinformation and in some cases, outright lies.

> By the end of 2008, the amount of ***ethanol*** we were producing monthly ***nearly equaled*** the amount of ***gasoline*** we refined from all the oil we imported ***from Saudi Arabia.***

They argued that ethanol took more energy to produce than it yielded; that diverting corn to ethanol was raising food prices for Americans; and this purported shortage of corn was starving poor people abroad.

Corn ethanol, it's true, is not the sole solution to our energy problems. The jury is still out on the full range of environmental benefits. But the case the grocery manufacturers ginned up against ethanol is demonstrably flimsy. In fact, it's hard not to conclude that they have already lost this debate.

First, let's look at supply. There is plenty of corn to go around in the U.S. and enough to meet demand for exports. Every year since 1995, farmers got an average of three more bushels a year from the same acre of corn.

Even with delayed planting and Midwest floods, 2008 was the second-largest corn crop on record. There is corn left over from 2007. So we will likely stockpile as much as a tenth of the crop this year. And farmers expect yields to double in the next 25 years.

Now for the environmental debate: Two studies that were not reviewed by other scientists and which Time magazine cited in a 2008 cover story hypothesized that an unintended consequence of making ethanol from corn would be more greenhouse gases released into the atmosphere as farmers clear new land around the world. The studies theorize that as an increasing amount of American corn is converted to ethanol, other grains must be grown elsewhere around the world to compensate, which will lead to the destruction of rain forests in the Amazon and environmentally sensitive land elsewhere.

But two Department of Energy scientists, Dr. Michael Wang of the department's Argonne National Laboratory and Zia Haq of its Energy Efficiency and Renewable Energy office, called the studies "speculative" and "limited" and said they "may misguide biofuel policy development."

A key flaw these scientists cited: The studies underestimated how fast American corn farmers are getting ever more corn from the same amount of land to meet demand.

At any rate, the 2007 energy bill recognized these concerns about land-use changes and required the Environmental Protection Agency to analyze the entire process of making ethanol, from growing corn to distilling the alcohol. If, as the two studies suggest, the indirect impact of changes in land use on the environment is detrimental, the government will take away tax credits to ethanol.

The EPA is already studying the issue and preliminary findings suggest corn ethanol is, all things considered, considerably better for the environment than gasoline. Amid the long and sometimes heated debate between ethanol proponents and detractors, some of the most recent studies indicate that modern ethanol plants and farming practices cut greenhouse gas emissions far more than previously estimated.

One study recently published in the *Journal of Industrial Ecology* found that greenhouse emissions from corn ethanol are as much as 60 percent lower than gasoline.

The U.S. Department of Energy calculates that using 6.5 billion gallons of ethanol in 2007 reduced greenhouse gas emissions by about 13 million tons. Studies also show ethanol reduces tailpipe carbon-monoxide emissions by as much as 30 percent.

The bottom line: Ethanol has energized the corn business while providing renewable energy. It has helped raise corn prices above the cost of production,

U.S. Ethanol Production Capacity, 2008

State	Production Capacity (Millions of Gallons)
Iowa	3,076.0
Nebraska	1,444.0
Illinois	1,190.0
Minnesota	1,081.6
South Dakota	1,016.0
Indiana	899.0
Wisconsin	498.0
Kansas	491.5
Ohio	470.0
North Dakota	353.0
Tennessee	267.0
Michigan	265.0
Missouri	261.0
Texas	250.0
New York	164.0
Oregon	148.0
California	136.5
Colorado	125.0
Georgia	100.4
Arizona	55.0
Idaho	54.0
Mississippi	54.0
Kentucky	38.4
New Mexico	30.0
Wyoming	6.5
Louisiana	1.5
Totals	**12,475.4**

Source: Renewable Fuels Association, January 2009

allowing the markets to pay farmers for their crops instead of government support programs. And it has boosted tax revenue from rural areas.

Feeding Animals

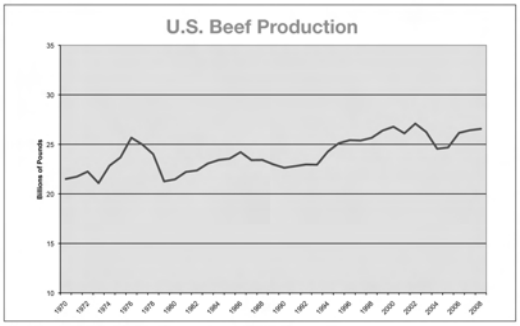
The livestock feeding operations that grow beef, poultry, pork and the dairy farms that produce milk are corn's biggest customers, using almost 6 billion bushels annually, or almost half of the corn crop.

Corn makes possible a wide variety of fresh, inexpensive meat and poultry. Few people realize this is a relatively recent development.

Corn has made beef the single largest business in American agriculture, with more than 1 million businesses, many of them small, says the National Cattlemen's Beef Assn. — the typical herd size is 40 cattle.

The young animals these ranchers raise have been going to big animal-feeding operations since the 1950s. They bring animals to market more efficiently than ranchers who raise cattle solely on grass.

It was only with the coming of the feedlots that most people could afford to eat meat every day — sausage for breakfast; bologna sandwich for lunch; pork chops for dinner.



Source: U.S. Dept. of Agriculture, Economic Research Service

These modern livestock-feeding operations brought industrial-production techniques to raising animals for food. They bring together thousands of steers at a time to be fattened humanely and according to federal regulations. The average cow now yields almost 600 pounds, up from 400 just 40 years ago. Each year the industry turns out more than 26 billion pounds of beef.

That made it a $75 billion industry in 2007, triple what it was a decade earlier. That year spending on beef was $250 for every man, woman and child in America, who consumed an average 63 pounds (60 for chicken).

However, critics such as Michael Pollan (author of the *New York Times* bestseller *The Omnivore's Dilemma*) contend the feedlots require widespread use of antibiotics for cattle which, these critics say, threatens to generate microbes resistant to antibiotics that could not only strike down cows but also, eventually, humans.

But the Food and Drug Administration, the U.S. Department of Agriculture and even the United Nations have a different view.

"For food animals, the gains that have been made in food-production capacity would not have been possible without the ability of safe and effective drugs to contain the threat of disease to animals," say the FDA's veterinarians.

The United Nations' World Health Organization says antibiotics "are vital medicines for the treatment of bacterial infections in both humans and animals."

Feeding People

The corn we know best is the corn we see on our plates. This is sweet corn or corn on the cob. Yet it is by far the smallest part of the crop, less than 1 percent of the corn grown for domestic consumption in 2007, or a scant 193 million pounds.

According to the Agriculture Department, only 19 cents of every dollar you spend on food goes to farmers. And corn farmers get only a few cents of that. Labor costs add 38 cents, while packaging, transportation, energy, advertising and profits account for 24 cents.

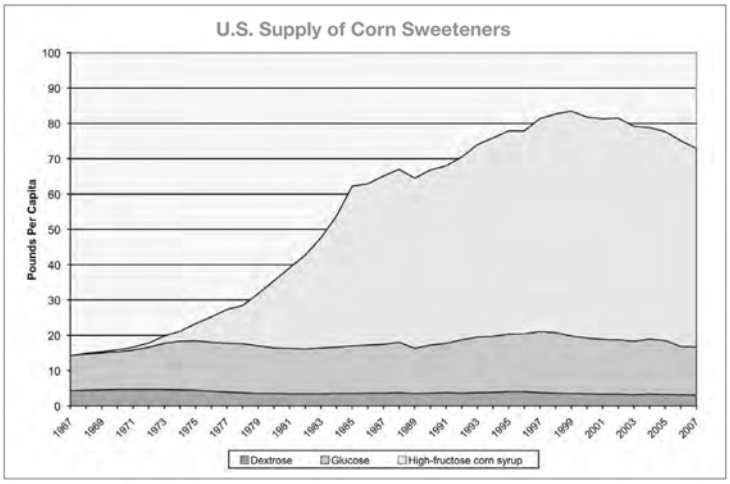
Foods like cereal, snacks and soda sweetened with corn syrup contain very little corn, so even big drops or rises in the price of corn don't make much difference. A box of corn flakes contains 10 ounces of corn, or about a nickel's worth — even at $5 a bushel.

Source: USDA's Economic Research Service

The cost of a barrel of oil, according to the global consulting firm LECG, has two to three times more impact on retail food prices than grain prices, especially in 2008 as oil prices jumped to record highs.

Corn's biggest and most valuable use in foods is as a sweetener, especially high-fructose corn syrup. While some critics object to what they contend is the subsidizing of a major cause of obesity through farm subsidies, the American Medical Association and the pro-consumer Center for Science in the Public Interest say the sweetener is no better or worse than regular sugar when consumed in moderation.

"The special harmfulness of high-fructose corn syrup has become one of those urban myths that sounds right, but is basically wrong," says Michael Jacobson, executive director of the consumer group.



Source: U.S. Dept. of Agriculture, Economic Research Service

Chapter Two: The Supply of Corn

Despite the panic in 2008, when corn prices doubled, farmers provided plenty of corn to go around and will continue to do so. Farmers produced 12 billion bushels, or $52 billion worth of corn, which also makes it by far America's most valuable crop.

In fact, American farmers produced the five largest corn crops in history during the past five years. Even after supplying food-makers, ranchers, ethanol producers and grain exporters, America will *again* be able to save 10 percent of this year's harvest for the future.

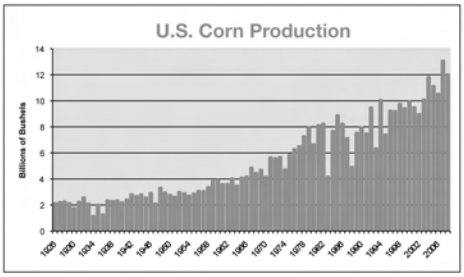
Corn production has marched steadily upward for decades while using fewer acres.

Farmers today grow five times as much corn as they did in the 1930s — on 20 percent less land. That is still 13 million acres, or 20,000 square miles, twice the size of Massachusetts. The yield per acre has skyrocketed from 24 bushels in 1931 to 154 now, or a six-fold gain. And the Agriculture Department expects the average yield per acre to double in the next 25 years.

What is driving this revolutionary change? For starters, corn is genetically modified to be resistant to insects, fungus and even drought.

And farmers are using cutting-edge technology that uses less energy and cuts waste. Many farmers, for instance, use global positioning systems to apply fertilizer, using soil analysis and detailed maps of their fields downloaded to the tractor's computer to know how much fertilizer to apply to each part of the field.

These "precision farming" techniques also include using GPS to measure crop yields in each part



Source: U.S. Dept. of Agriculture, Economic Research Service

of the fields, using this to tweak the amount of fertilizer to apply the following year. Precision farming techniques are also used in applying the application of crop-protection products for better yields and better environmental protection.

The Forecast: Enough Corn for All Users

As for demand for corn, it is at an all-time high, thanks mostly to corn's newest market, ethanol. But so is the supply, thanks to the innovation we detail in this book.

Ethanol, which consumed a quarter of the corn crop in 2008, will jump by half in the next decade, consuming a third of the crop, the Agriculture Department forecasts. Eventually, corn used for ethanol will recede as a share of the corn crop as biofuels producers refine the technology for making fuel from other plant materials.

Corn used to make processed food — and especially for industrial uses like making chemicals — will grow significantly, perhaps as much as 40 percent.

One Bushel of Corn (56 lb.) Provides:

31.5 lb. of starch
OR
33 lb. of sweetener
OR
2.8 gal. of fuel ethanol
OR
22.4 lb. of PLA fiber/polymer

Plus:
17.5 lb. of distillers dried grains with solubles*
13.5 lb. of gluten feed**
2.6 lb. of gluten meal**

AND
1.5 lb. of corn oil**

*In dry grind ethanol process.
**In wet mill ethanol process. Gluten feed is 20 percent protein and gluten meal is 60 percent protein.

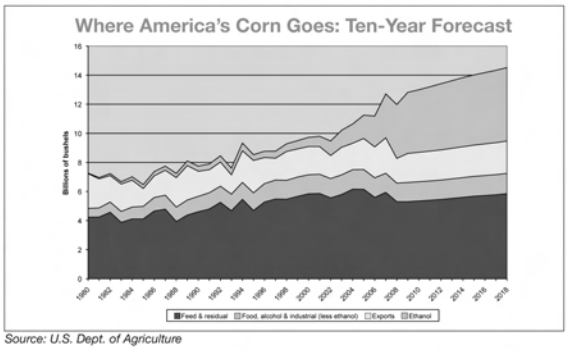
Source: National Corn Growers Association

On the other hand, corn for animal feed and reserves, now 42 percent of consumption, will fall to 40 percent by 2019. In fact, the Agriculture Department says use of corn for industrial products and food-processing will surpass animal feed in the 2009 harvest season.

Meat is a growing industry with healthy exports. However, demand for corn from livestock and chicken producers has been relatively flat for a decade as the livestock industry becomes more efficient and the feedlots replace some corn with distillers grains, a by-product of producing ethanol.

Corn exports will stay flat at 15 percent, according to the Department of Agriculture. Most of our corn exports are destined to feed livestock, rather than be used for direct human consumption.

In 2007, corn farmers reacted to demand by planting 94 million acres, a 20-percent increase. After a decline in 2008, as other crops grew more valuable, corn acreage will increase and remain around 90 million acres for the next decade, the Agriculture Department projects.

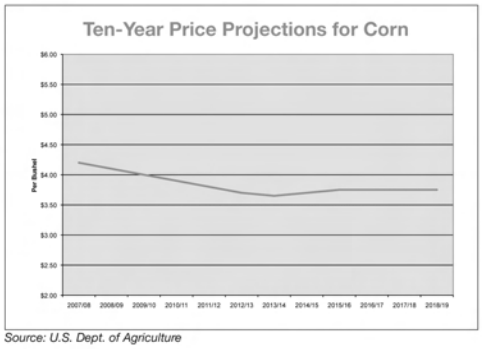


Source: U.S. Dept. of Agriculture

But the outlook for corn prices isn't good. The department forecasts prices to continue to rise slightly through 2010 thanks to increased ethanol production, then decline to around $3.60 a bushel for the rest of the decade as both the animal feed and ethanol business slow.

A more recent survey by the Congressional Budget Office says approximately the same thing: Prices will bottom out at $3.65 a bushel by 2012 and rise no higher than $3.94 through 2019.

Most importantly, though, the corn crop will continue to expand every year, the Agriculture Department forecasts, so that there will still be more than 8 percent of the crop left over by the end of the year in 2018.



Source: U.S. Dept. of Agriculture

Exporting to the World

For much of their history, Americans spent most of their income on food. Now we spend just 10 percent, says the Agriculture Department. Households in less-developed countries like India often spend 50 percent of their income on food. Even countries in Europe spend more than twice what U.S. consumers spend. Americans have more money to spend elsewhere — in their children's education, travel, houses and cars.

We produce enough corn that we can export one in every five rows of corn each year, most of it going to animal-feeding operations abroad.

Our corn exports, however, haven't changed much and aren't likely to in the future.

> We produce enough corn that we can export
> ***one in every five rows***
> of corn each year.

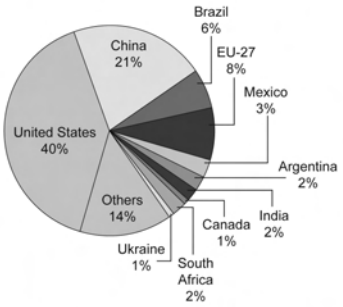
Much of the rest of the world is getting more productive and hence more self-sufficient. Plus fears of genetically modified American corn have slowed exports, the General Accountability Office says, even though U.S. authorities and scientists say these fears are completely unjustified.

Still, while the $13 billion exported corn brought in during 2008 didn't dent our enormous, petroleum-inflated trade deficit, it remains one of the few bright spots in the U.S. balance of trade.

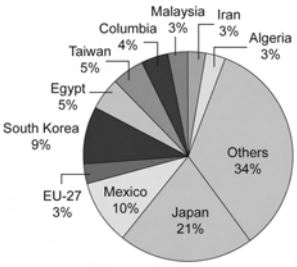
In 2008, our biggest customers were Japan, which took 21 percent of world corn exports; Mexico, 10 percent; and South Korea, 9 percent.

Our position as a leading corn grower and exporter isn't likely to change much in the foreseeable future. The U.S. grows by far the most corn in the world, at 40 percent, followed by China, 19 percent. Then comes Brazil with 7 percent and the European Union with 6 percent.

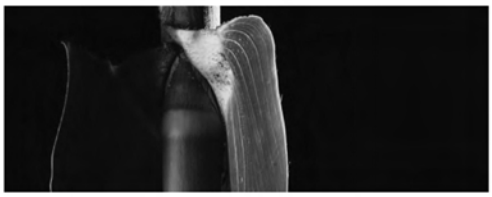
World Corn Production, 2008/2009



Top Corn Importers, 2008/2009



Source: U.S. Dept. of Agriculture, Foreign Agriculture Service



Chapter Three: Corn and the Environment

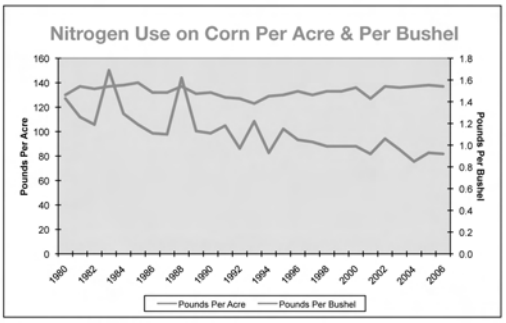
With the help of scientists, America's farmers have initiated a green revolution by using new technologies and innovative practices that let them produce more corn with less energy and fewer resources.

Farmers are using detailed maps of their land made from satellite and aerial photos combined with sensing devices in the soil that measure water, weeds and nutrients. Using global positioning systems, they can pinpoint exactly where the fields need fertilizer, herbicides and water, making cultivation far more efficient.

Farmers use conservation practices like continuous no-till, where the land is never cultivated and planting is done using "drill" equipment instead of traditional planters. This practice increases organic matter in soils and reduces the need for fertilizer.

Farmers also use-nutrient management plans, which employ soil-analysis tests to determine which nutrients will grow the most efficient crop. Other conservation practices include winter cover crops and buffer zones, allowing plants to take up excess nutrients and avoid runoff that affects water quality. And farmers are beginning to use "pre-stalk nitrate tests" that measure the amount of nutrients available to the plant before applying fertilizer.

Farmers also use GPS simply to navigate their fields, ensuring they don't cover even an inch of the same soil twice, saving time and diesel fuel.



Source: Blue, Johnson & Associates, Inc.

Finally, farmers attach monitoring equipment to their combines to track how much corn is growing everywhere in the field so they can adjust accordingly.

Technology Reduces Corn's Environmental Impact

Since the 1970s and the birth of the environmental movement in the U.S., corn growers have been using sound practices in managing the land and using less pesticides and fertilizer.

Reduced tillage and other farm management practices have ***reduced soil erosion 43% in 20 years.***

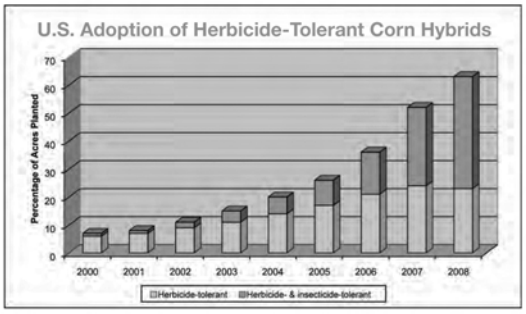
As technology advances, farmers have used it to both increase productivity and profitability while being stewards of the environment.

After all, their families live on the farm, and the land is the farmer's primary asset, often passed on the next generation.

Those concerns make a difference. A 2006 U.S. Geological Survey report on the quality of the nation's streams and ground water found pesticides "at concentrations far below federal or state standards and guidelines for protecting water quality"

Furthermore, improvements in crop-protection products in the last 20 years have made them less toxic and more degradable.

Reduced tillage and other farm management practices, meanwhile, have



Source: U.S. Dept. of Agriculture, National Agricultural Statistics Service

reduced soil erosion 43 percent in 20 years, says the Agriculture Department. A farmer can save as much as 3.5 gallons of fuel an acre from no-till farming.

Through farm bill conservation programs, farmers are reducing soil erosion, improving water quality and increasing wildlife habitat.

Less than 15%
of all the corn farmland in the U.S. is **irrigated.**

Corn farmers participate in state, local and national programs that idle the most environmentally sensitive land.

Farmers are also finding ways to better manage water. As competition for it intensifies in some areas of the country, they are using new technology, from soil-moisture testers to subsurface irrigation techniques, to reduce water use. Less than 15 percent of all the corn farmland in the U.S. is irrigated. The remaining acres rely solely on rainfall.

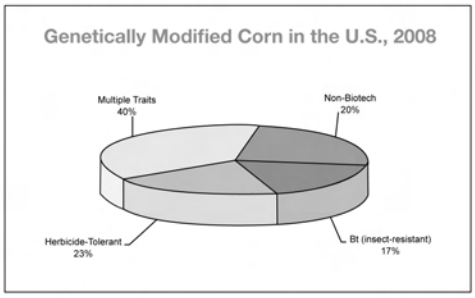
And farmers produce 70 percent more corn from a pound of fertilizer than they did 35 years ago.

Biotechnology: Getting the Most from a Seed

As early as 1941, American scientists coined the term "genetic engineering," also called biotechnology.

Biotech, however, really got underway in the 1990s, and now bioengineered crops are everywhere.

By 2005 the U.S. was the world's biggest grower of biotech crops with more than half. It's thought global farm income would have been about $5 billion less that year without those crops. The biggest gainers have been soybeans and cotton. However, corn boosted farm income by more than $3 billion by 2005.



Source: U.S. Dept. of Agriculture, National Agricultural Statistics Service

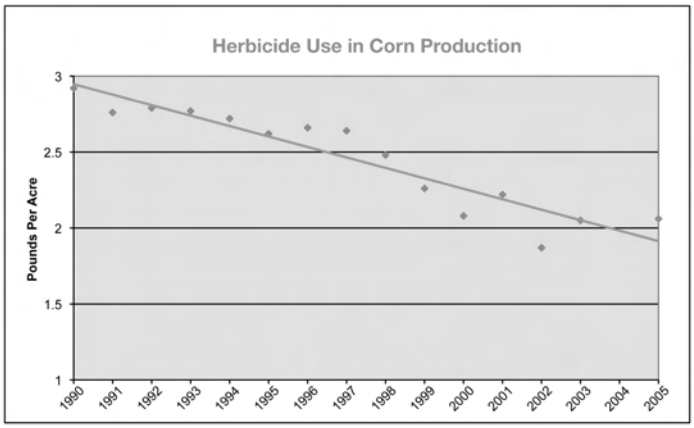
Farmers can increase production by using seeds genetically modified to produce plants that can make their own pesticides, resist drought or even contain extra nutrients.

Already, for example, genetically engineered, insect-resistant cotton, soybeans and corn mean farmers can use less synthetic pesticides that may contaminate groundwater and soil.

Herbicide-tolerant corn is particularly compatible with no-till agriculture that helps preserve topsoil from erosion. Reduced tillage improves the soil structure, increasing water movement through the soil following irrigation or rain and holds it there.

Agricultural biotechnology has been used to protect crops from devastating diseases that could wipe out the crop and create food and feed shortages.

Despite the advantages, GMOs, or genetically modified organisms, have stirred controversy, especially abroad. The Agriculture Department says those fears are unfounded.

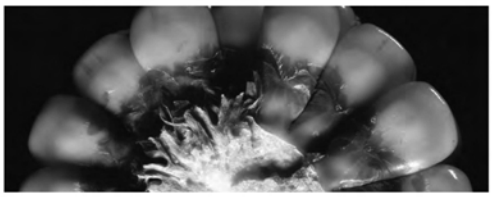


Source: U.S. Dept. of Agriculture, National Agricultural Statistics Service

"The USDA's Animal and Plant Health Inspection Service and the EPA review any environmental impacts of such pest-resistant biotechnology-derived crops prior to approval of field-testing and commercial release," says the Agriculture Department.

"There's a misconception that it would be better to go back to more primitive methods of agriculture because chemicals are bad or genetics is bad. This is not true," wrote Patrick Moore, co-founder of the environmental group Greenpeace.

"We need to use the science and technology we have developed in order to feed the world's population, a growing population. And the more yield we get per acre of land the less nature has to be destroyed to do that… It's simple arithmetic. The more people there are, the more forest has to be cleared to feed them, and the only way to offset that is to have more yield per acre."



Chapter Four: The Farmer

Many Americans believe the day of the small farmer is over. But corn production remains a small-business industry, according to the Census of Agriculture.

Individuals or families own the vast majority of corn farms — 82 percent, or about 284,000 out of 348,000 — and grow about the same percentage of the harvest. Another 6 percent are family-held corporations; 11 percent are owned by partnerships. The remaining handful — less than 4,000 — are owned by other types of corporations or estates, trusts and institutions.

Individuals or families own ***82%*** of corn farms. Another ***6%*** are ***family-held corporations.***

The Federal Bureau of Labor Statistics, says that most farms employ only the farmer and perhaps a family member or hired hand or two.

Just 7 percent of corn farms gross more than $1 million a year. Two-thirds gross less than $250,000 a year.

And the average corn farm has fewer than 250 acres. Only 8 percent are bigger than 2,000 acres, according to government statistics.

Agriculture still has a hugely important place in this country. There were 1.3 million farmers, ranchers and agricultural managers in 2006, according to the federal Bureau of Labor Statistics, not many out of a work force of 146 million. (About 80 percent of the farmers and ranchers are self-employed.)

But farming isn't merely an iconic activity, a tradition that ties us symbolically to the founding of the nation: It is the economic foundation on which our country first grew strong.

Farms in all of agriculture, including corn, are consolidating, which with increased productivity means there are fewer jobs down on the farm. Yet there has also been significant growth in businesses related to corn, such as bio-refining, making equipment and developing new biotechnology products.

U.S. Corn Production by State, 2008

	Acres Planted (1,000s)	Acres Harvested for Grain (1,000s)	Average Yield (Bushels Per Acre)	Total Production (1,000s of Bushels)
Alabama	260	235	104	24,440
Arizona	50	15	165	2,475
Arkansas	440	430	155	66,650
California	670	170	195	33,150
Colorado	1,250	1,080	137	147,960
Connecticut	27	-	-	-
Delaware	160	152	125	19,000
Florida	70	35	105	3,675
Georgia	370	310	140	43,400
Idaho	300	80	170	13,600
Illinois	12,100	11,900	179	2,130,100
Indiana	5,700	5,460	160	873,600
Iowa	13,300	12,800	171	2,188,800
Kansas	3,850	3,630	134	486,420
Kentucky	1,210	1,120	136	152,320
Louisiana	520	510	144	73,440
Maine	29	-	-	-
Maryland	460	400	121	48,400
Massachusetts	19	-	-	-
Michigan	2,400	2,140	138	295,320
Minnesota	7,700	7,200	164	1,180,800
Mississippi	720	700	140	98,000
Missouri	2,800	2,650	144	381,600
Montana	78	35	136	4,760
Nebraska	8,800	8,550	163	1,393,650
Nevada	5	-	-	-
New Hampshire	15	-	-	-
New Jersey	85	74	116	8,584
New Mexico	140	55	180	9,900
New York	1,090	640	144	92,160
North Carolina	900	830	78	64,740
North Dakota	2,550	2,300	124	285,200
Ohio	3,300	3,120	135	421,200
Oklahoma	370	320	115	36,800
Oregon	60	33	200	6,600
Pennsylvania	1,350	880	133	117,040
Rhode Island	2	-	-	-
South Carolina	355	315	65	20,475
South Dakota	4,750	4,400	133	585,200
Tennessee	690	630	118	74,340
Texas	2,300	2,030	125	253,750
Utah	70	23	157	3,611
Vermont	94	-	-	-
Virginia	470	340	108	36,720
Washington	165	90	205	18,450
West Virginia	43	26	130	3,380
Wisconsin	3,800	2,880	137	394,560
Wyoming	95	52	134	6,968
Total U.S.	**85,982**	**78,640**	**153.9**	**12,101,238**

Farming helps create perhaps as many as 24 million more jobs in other industries, everything from chemical factories to truck drivers to meat-packing plants to supermarkets.

Farming is now a fundamental strategic asset: After all, if we can't feed and fuel ourselves, we are at the mercy of others. Our dangerous addiction to imported fuel is the perfect example of putting our future and our economy in the hands of others.

Farmers grow corn in almost every state, from Maine to New York to New Mexico to California.

Growing Corn: Long Days, Lots of Work

"The work of full-time farmers, ranchers, and agricultural managers is often strenuous," says the Bureau of Labor Statistics. "Work hours are frequently long; and these workers rarely have days off during the planting, growing, and harvesting seasons.

"Nevertheless, for those who enter farming or ranching, the hard work is counterbalanced by their enjoyment of living in a rural area, working outdoors, being self-employed and making a living off the land."

So complicated is farming technology these days that, instead of the traditional path of learning the business from his or her father, increasingly farmers earn at least a two-year associate degree from a college or university.

It will continue to be tough for small farmers. The long-term trend of farm consolidation will continue, says the Bureau of Labor Statistics, for at least the next decade, which means a "moderate" decline in on-farm employment of 8 percent.

"The continuing ability of the agriculture sector to produce more with fewer workers will cause some farmers to go out of business as market pressures leave little room for the marginally successful farmer," says the bureau. "As land, machinery, seed, and chemicals become more expensive, only well-capitalized farmers and corporations will be able to buy many of the farms that become available.

Job Outlook for Farmers, Ranchers and Agricultural Managers				
Occupation	2006 Employment	2016 Projected Employment	Projected Change, 2006-16	
			Number of Jobs	Percent
Agricultural managers	1,317,000	1,230,000	-87,000	-7
Farm, ranch, and other agricultural managers	258,000	261,000	2,900	1
Farmers and ranchers	1,058,000	969,000	-90,000	-8

Source: Bureau of Labor Statistics

"These larger, more productive farms are better able to withstand the adverse effects of climate and price fluctuations on farm output and income."

Corn will still provide jobs because so many farmers are retiring in the next decade. Three quarters of the 280,000 corn farmers are 45 or older.

More farmers are getting degrees because these days they must now know as much about international markets and biotechnology as they do about the engines of their combines and the land. Computer-literate, savvy about business and markets, technically proficient, farmers must deal with a business that has changed as profoundly as any aspect of American life during the past 100 years.

The trusty old tractor and combine of the past are not only bigger but laden with computers, satellite links and GPS technology.

And farmers must be effective marketers to a get a reasonable price for their crop. The Chicago Board of Trade discloses commodity prices daily. Many farmers use financial tools such as forward contracting or hedging to mitigate risk. Commodity markets, in fact, with weather are the two biggest risks farmers face daily.

Chapter Five: The Politics of Corn

For decades, U.S. farm policy ensured abundant — and thus cheap — corn. For three quarters of a century, the Farm Bill has been at the heart of that policy and at the heart of the corn business as well, as important as weather or crop prices or technology.

The Farm Bill is also a key piece of federal policy on health and nutrition, since more than $200 billion of the bill's $300 billion in federal expenditures over its five-year life are for food stamps and other food programs for the poor. That is why so many urban legislators, too, vote for the bill every five years. Of the $300 billion, in fact, less than a quarter goes to farm programs.

Farmers receive what are called direct payments to make up the difference between their cost to grow corn and what the market offers to pay them for it. These payments now total $5 billion a year to farmers of corn, wheat, soybeans, rice, cotton, sorghum, barley and other crops.

Of the ***$300 billion*** program, ***less than a quarter*** goes to farm programs.

When the Farm Bill came up for its five-year renewal in 2007, critics and corn farmers thought the time ripe for change.

Farmers argued government support should provide only a safety net and only when needed the most, especially in disaster years. Corn farmers argued government support isn't necessary when yields are good and prices make it profitable to grow corn. After a major effort and much opposition, we now have the Average Crop Revenue Election program, or ACRE. ACRE is a revenue-based system that looks at overall farm stability instead of market price only.

Farmers can elect to enroll in ACRE, which pays them only if they are facing drops in revenue from bad weather or declining prices. Farmers who choose ACRE accept a reduction of 20 percent in direct payments in return for a revenue-based safety net. Corn growers believe that safety nets should be used only on behalf of farmers who are in trouble because of crop disasters, not for millionaires who aren't even growing food on their land.

"Changing how subsidy programs operate is critical to achieving reform that

has a long-term impact," says the Iowa State Center for Agricultural and rural Development, which supports ACRE. We corn farmers agree.

So ACRE is a step in the right direction.

What's Next With Farm Policy?

Former Iowa governor and new agriculture secretary Tom Vilsack is not likely to make major changes right away. For one, farm-state legislators said in early 2009 that they don't want to reopen the Farm Bill they passed less than a year ago, saying it is a contract with farmers and can't be amended without serious financial consequences.

By appointing him, President Obama reiterated the administration's commitment to ethanol, despite the mud opponents threw at it throughout 2008. The Renewable Fuels Standard (passed in 2005 and expanded in 2007) will assure more ethanol is used in gasoline, a measure supported by the Obama Administration.

Corn farmers believe this is positive for the economy, national security and consumers. According to a study commissioned by the Renewable Fuels Association, increased ethanol production will:

- add more than $1.7 trillion to the economy between 2008 and 2022;
- generate an additional $436 billion of household income for Americans during that time;
- support creation of as many as 1.1 million new jobs;
- generate $209 billion in new federal tax receipts.

"Tom understands that the solution to our energy crisis will be found not in oil fields abroad," Obama said in nominating Vilsack, "but in our farm fields here at home."

The EPA continues to study ethanol's environmental impact.

The tariff on imported ethanol expires in 2010 and is likely to come up for discussion this year.

Increased ***ethanol*** production ***will add*** more than ***$1.7 trillion*** to the economy between 2008 and 2022.

Then there's ethanol's role in helping reverse the decline of the rural economy, a long, slow drain that left vast swatches of the American interior studded with withering small towns, poverty and a dying way of life.

Ethanol brings good jobs and prosperity to declining areas. (Service and manufacturing now provide more jobs in rural areas than farming, according

to government figures.) The Farm Bill has provisions for rejuvenating rural areas, too.

As for the Farm Bill, some experts say it's unlikely Congress will revisit it until 2012 — at least the provisions on farm supports. More likely, Mr. Obama and Mr. Vilsack, both concerned about health and safety issues related to food, will try to tinker with the portion of the bill concerning food programs for the poor and school lunches.

> Being sufficient in ***growing our own food*** and ***our own fuel*** is a ***huge strategic asset.***

As we look ahead, it's vital we get the ethanol and environmental issues right: Ultimately the health of farming affects the strength of the economy, the environment, trade relations and our place in the world as at once a global player and a country able to supply itself with all the food it needs. We must do nothing to impair agriculture.

One thing is clear: Being sufficient in growing our own food and our own fuel is a huge strategic asset and a necessity. In a dangerous and uncertain world, we can no longer rely on hostile countries for our oil.

We may often overlook our food and fuel systems in favor of soldiers and guns and ships, but they are crucial to our national security and our economy in these uncertain times.

"We are in a period now of intense volatility," says Clayton Yeutter, agriculture secretary under President George H. W. Bush. "Farmers here and in other countries are really struggling to figure out how to handle this."

We've detailed in this Fact Book how important corn is. Our corn farmers are the world's most productive; our corn crop is used to make dozens and dozens of products; we grow all we need and enough for a reserve and for exports.

We should do nothing to imperil this.

The Corn Farmers Coalition educates policy-makers in Washington about how innovative farmers are growing more corn every year with fewer resources while protecting the environment. The coalition includes:

National Corn Growers Association
Illinois Corn Marketing Board
Indiana Corn Marketing Council
Iowa Corn Promotion Board
Kansas Corn Commission
Kentucky Corn Growers Association
Missouri Corn Merchandising Council
Nebraska Corn Board
Ohio Corn Growers Association
Virginia Grain Producers Association
Wisconsin Corn Growers Association

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May 2009

SUBMITTED QUESTION

Response from Howard K. Gruenspecht, Ph.D., Acting Administrator, U.S. Energy Information Administration, U.S. Department of Energy

Question Submitted By Hon. Betsy Markey, a Representative in Congress from Colorado

EIA estimates that in 2007 2.6 percent of total U.S. natural gas consumption was used for on-farm activities such as facility heating and grain drying, and as the primary feedstock and process energy source to produce required farm chemicals and fertilizers. Feedstock and process energy uses of natural gas to produce farm chemicals and fertilizers are roughly five times greater than on-farm uses of natural gas.

In the updated *Annual Energy Outlook 2009* reference case (including the impact of the American Recovery and Reinvestment Act), the share of total U.S. natural gas used on-farm and to produce agricultural chemicals and fertilizer is expected to increase to roughly three percent by 2016, then decline towards the 2007 share of total gas used by 2030.

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