National Corn Growers Association
www.ncga.com

August 19, 2009

Mary D. Nichols, Chairwoman
c/o Clerk of the Board
Air Resources Board
1001 I Street Sacramento, CA 95814

Chairwoman Nichols:

Now in its 51st year, NCGA is the premier organization representing the United States corn industry and represents more than 35,000 individual corn growers, 48 affiliated state-level organizations, and hundreds of thousands of growers who contribute to state corn checkoff programs. On behalf of these producers, I would like to thank the Air Resources Board (ARB) for the opportunity to comment on the staff modifications to the first draft of the proposed regulation implement a proposed Low Carbon Fuel Standard (LCFS).

NCGA applauds your leadership in promoting alternative fuels. Increasing America's energy resources and protecting national security by reducing our dependence on foreign oil and continuing to grow our domestic renewable fuels industry are among the most important challenges facing our country. As corn growers, we play an important role in lessening our dependence on foreign oil. However, we have serious concerns about the trajectory of the current LCFS proposal in your state.

Today, the GTAP model, being static, is unable to account for the significant improvements in grain yields that have occurred since 2001, documented in the attached report, and are projected to continue through 2015 and beyond. As in our earlier comments, dated April 17, 2009, we would like to provide additional information on the future of increasing corn yields, new technologies, international yields, exports, land use change, oilseeds' effect on land use change, and the role of co-products.

We appreciate the additional analysis which has been undertaken in the sugarcane sector, and look forward to updated analysis and pathways in the corn-based ethanol sector.

The uncertainty around CARB's indirect land use (ILUC) determinations and the overall science of ILUC has been documented by numerous experts in the previous comment period prior to

April, 14, 2009, on the 1st ISOR, as well as in the research literature. Therefore, NCGA would like to reiterate recommendations that CARB delay its implementation of an indirect land use change component until such time as a scientifically accepted method to estimate indirect land use change is developed.

NCGA understands and appreciates that with sound science and a transparent process, the Air Resources Board will work with stakeholders in the renewable fuels industry in order for consumers in the State of California to enjoy the benefits of lower-carbon transportation fuels through the use of corn-based ethanol.

In conclusion, NCGA sees the grain based ethanol industry as a critical part of domestic energy security. Its inclusion as part of the nation's energy policy has strengthened and further diversified our nation's fuel supply in a time of global volatility and increasing demand for energy. Finally, as evidenced by the dramatic increase in yield per acre predicted for this fall, corn growers will continue to meet the growing demands of food, feed and fuel in an economical and environmentally responsible manner, while building a bridge to the next generation of biofuels.

Please find our comments attached and feel free to contact us if you have any questions or require additional information. Thank you in advance for your time and consideration in this matter of mutual interest. NCGA appreciates the opportunity to comment on this vitally important issue.

Regards,

NATIONAL CORN GROWERS ASSOCIATION

Bob Dickey
President

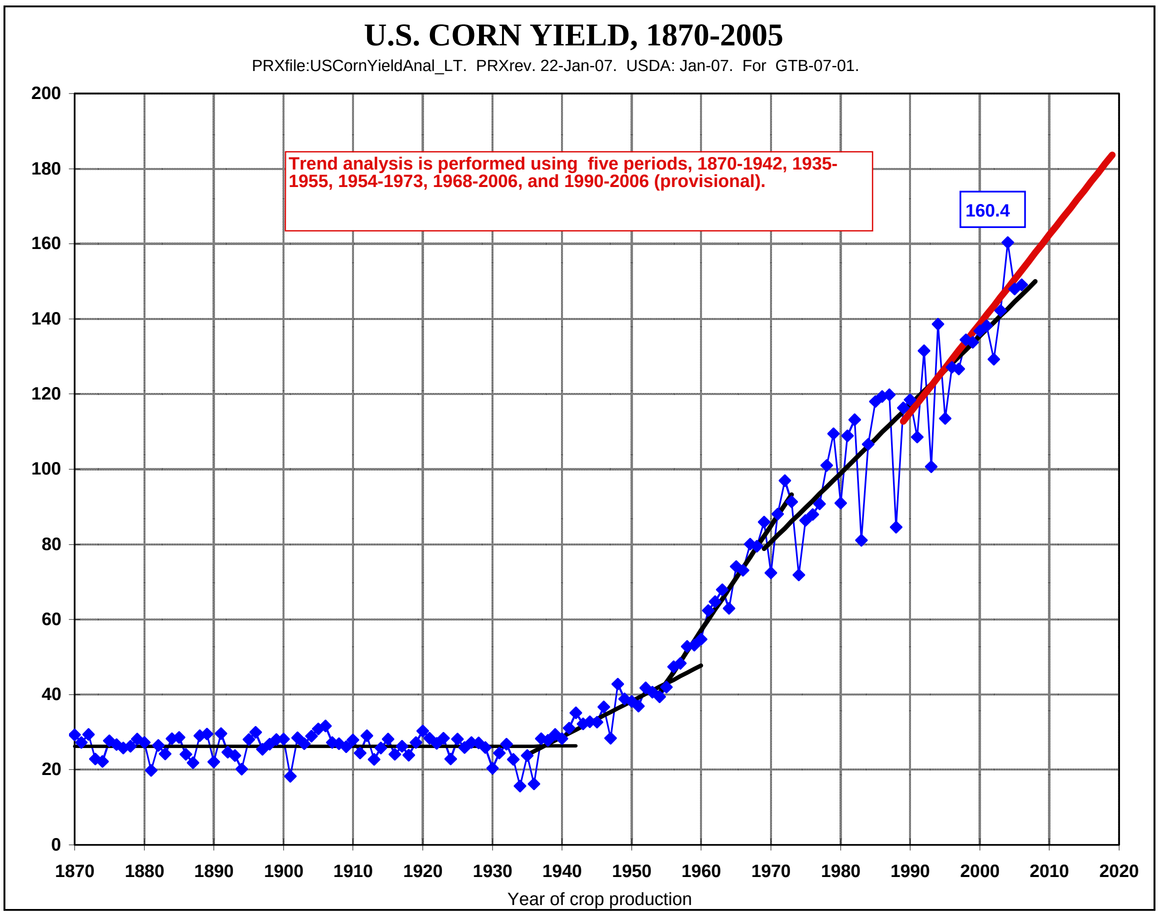
Ross Korves

Analysis for Submission on LCFS

U.S. Corn Yields

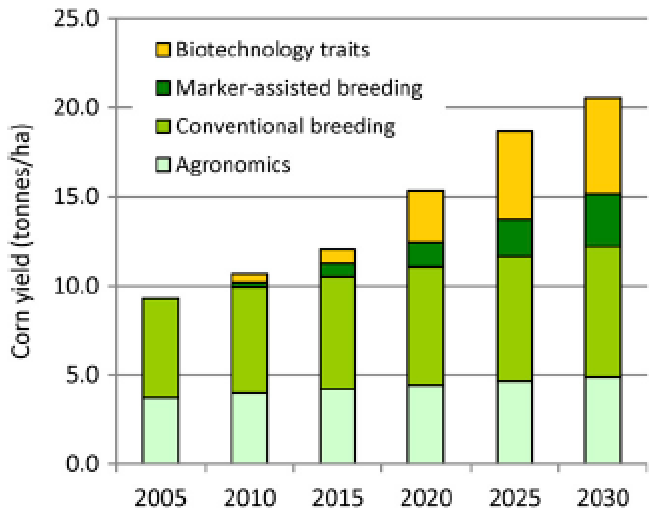
Since the wide adoption of hybrid seed corn in the 1940s corn yields have been increasing. See Figure 1. That technological breakthrough was followed by increased use of commercial fertilizers in the 1950s and 1960s and herbicides and insecticides in the 1960s and 1970s. The last half of the 1990s and the current decade have seed corn enhanced through biotechnology. The trend line for 1990 to today is steeper that the previous trend from 1970 to 1990.

Figure 1



Consensus estimates are that about 50-60 percent of the yield increases over the past 70 years are related to genetic improvements with the other 40-50 percent due to agronomic changes. Changes in agronomic practices are expected to play a much smaller role in total corn yield increases from the present to 2030 than from 1930 to now. See Figure 2 from Edgerton, Monsanto "Increasing Crop Productivity to Meet Global Needs for Feed, Food and Fuel," Plant Physiology, January 2009, Vol. 149, pp. 7–13. With yields increasing from 151 bushels per acre in 2005 to 325 bushels per acre by 2030, agronomic changes are expected to contribute about 15 bushels. Conventional breeding will add 25 bushels per acre and marker assisted breeding about 50 bushels per acre. Biotechnology is expected to add about 85 bushels per acre. This includes herbicide tolerance, insect resistance, drought tolerance and the introduction of three additional yield enhancing traits over the next decade.

Figure 2
Source of Future Corn Yield Increases



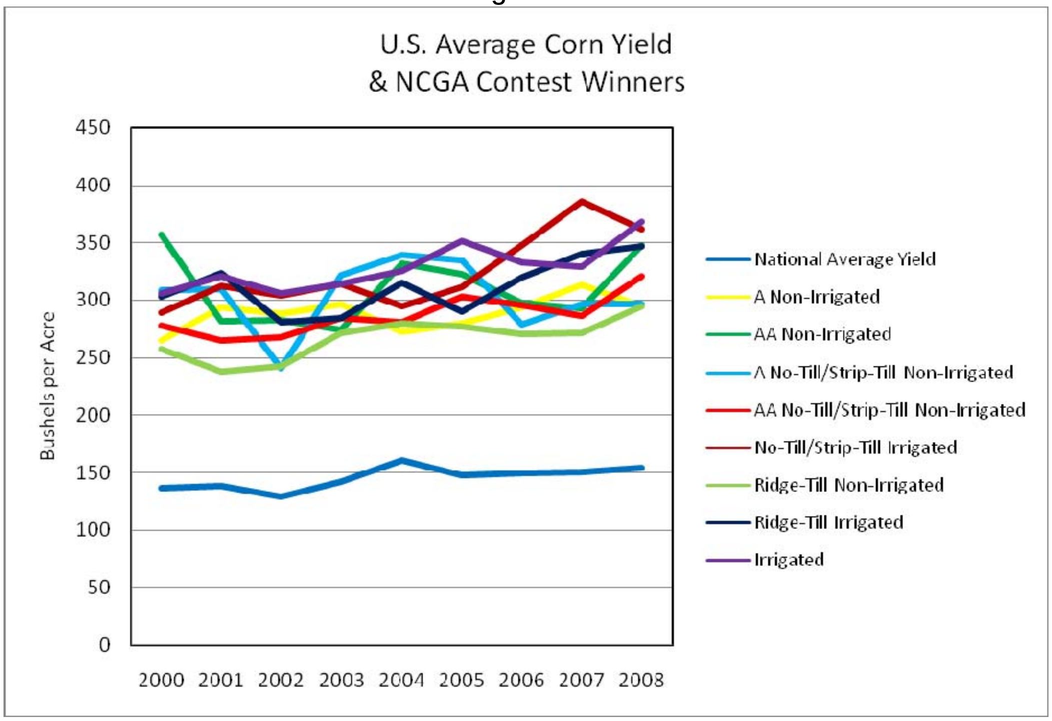
Source: Edgerton, Monsanto

Based on Edgerton estimates, about three-fourths of the yield increases in corn from now to 2030 will come from activities that had only a limited impact on yields through 2005 - marker assisted breeding (29 percent) and biotechnology (49 percent).

Edgerton also reported that the gap between corn test plot yields and average farm yields decreased from 48 bushels per acre in 1935 to 29 bushels per acre in 1990. In recent years this gap has widened indicating that on farm average yields may be headed higher as this new technology works through the seed development process. At Monsanto a seed corn hybrid's half life is about four years with a complete turn of products in seven years.

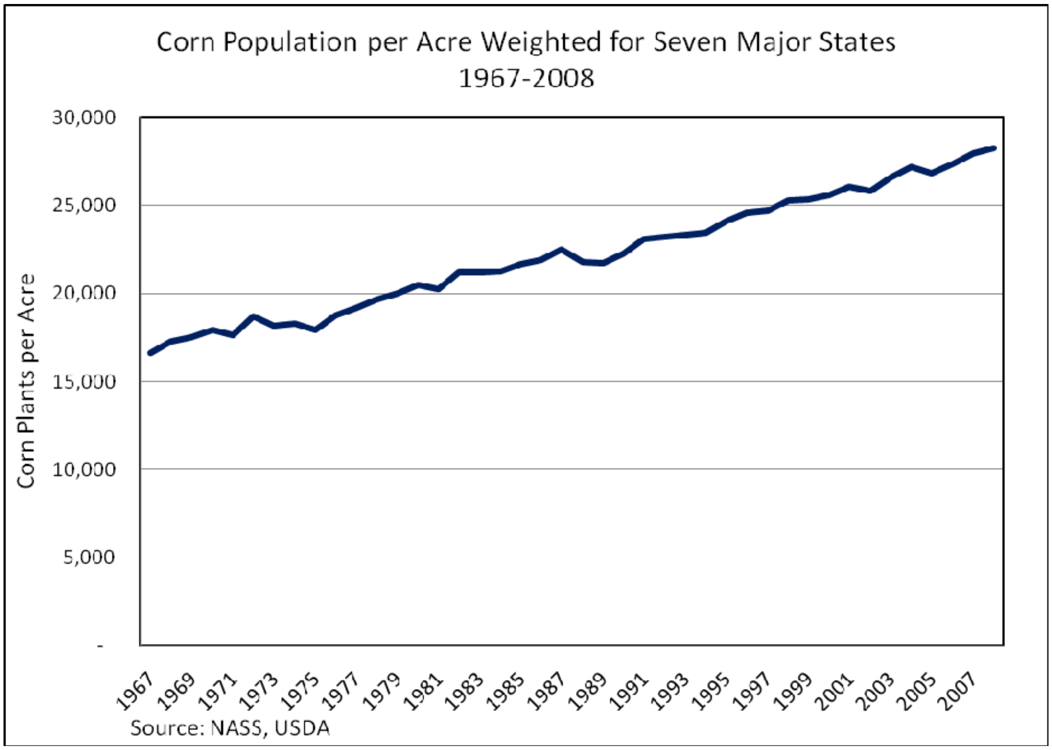
While yields of 300 bushels per acre in 2030 are large compared to national average corn yields in recent years, the yields are not large in relation to those being achieved under the best of conditions using existing corn production technology as shown in recent National Corn Growers Association (NCGA) national corn yield contest. In the 2007 contest David Hula of Charles City, Virginia recorded a yield of 385 bushels per acre. The theoretical limit on yields is thought to be about 400 bushels per acre. Most of the winners in recent years in the non-irrigated categories had yields of 250-300 bushels per acre. The winners in the irrigated categories had yields of 300-360 bushels per acres. Soil capabilities and rainfall patterns are available to support much higher yields than the average yields of today. Technology is now being developed to achieve those higher yields on a more consistent and wide-spread basis.

Figure 3



One of the reasons for higher corn yields is higher plant density per acre. Of the total dry matter accumulated by a corn plant about 50 percent remains in the stalk and 50 percent accumulates in the grain. Corn plants are bred to tolerate the stress of more plants per acre and that is reflected in higher corn yields. According to data from the National Agricultural Statistics Service of USDA, corn plant populations have increased for the seven major states from an average of 17,000 plants per acre at harvest in the late 1960s to 28,000 plants per acre in 2008. See Figure 4. Edgerton noted that seed corn is currently bred to handle plant populations of 30,000-35,000 per acre in commercial corn production in the U.S., but corn breeding programs are using plant populations of 65,000 plants per acre and higher.

Figure 4

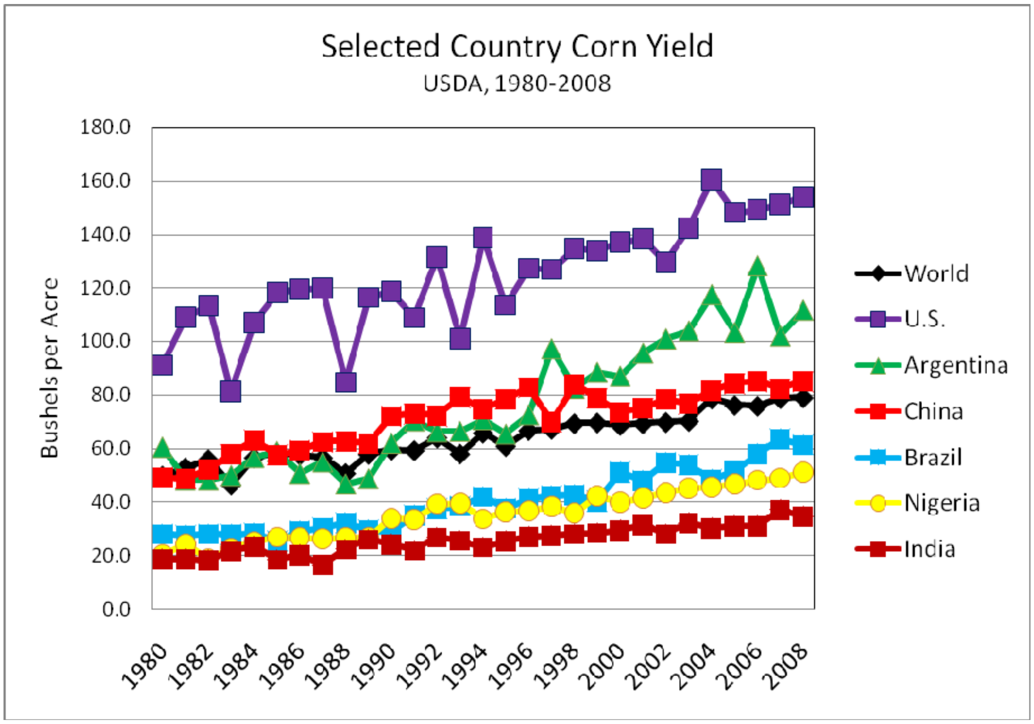


International Corn Yields

The quickest way to achieve higher worldwide corn production would be to increase yields on existing corn land. See Figure 5. The U.S. with 20 percent of the world's corn acreage harvested for grain has yields that are roughly twice the world average. Some of that is due to good soils, a favorable climate and well educated producers, but much of it is due to production practices, including fertilizer, pesticides and high quality seed. China, with the second largest area harvested for grain, has had only minor yield increases for the past 15 years. Argentina's yields are closest to the U.S., but their acreage is relatively small. While Brazil's yields are still low compared to the U.S. they have doubled yields in the last 15 years and the government has approved the use of insect resistant biotech corn. Nigeria has also made great progress. India has not made much progress in corn yields, but has made major progress in cotton yields with hybrid and biotech seed and the same technology is used in corn in other countries.

Corn yields in the developing world show a great long-term potential to increase corn production throughout the world without significantly increasing acres harvested. Brazil was able to double its yields in 15 years without using the latest seed technology. With biotech corn now becoming available yields should continue to increase. Biotech corn could also help countries in Africa make step changes in yields from their current low levels without increasing the use of pesticides. The use of fertilizers would boost yields further and mechanized farm equipment will allow for timelier planting and harvesting.

Figure 5



International Land Use Change

Land use has changed substantially in the world over the last 35 years, but it has had very little to with agricultural production activities in the U.S. Crop producers in the U.S. do not control cropping decisions or consumer demand decisions in the rest of the world; U.S. producers respond to what is happening in other countries.

U.S. acreage of the ten major worldwide annual crops in 2008/09 was roughly the same as in 1975/76. See Figure 6. The U.S. added some acreage during a time of high market prices in the late 1970s and the first three years of the 1980s, but those acres exited during the mid and late 1980s. Non-U.S. acreage increased from 1,550 million acres in the mid-1970s to 1,825 million acres in recent years. Acreage was flat for a few years in the late 1980s and again in the late-1990s. Note the rapid growth in non-U.S. acreage since 2002/03 as it increased from 1,700 million acres to a projected 1,840 million acres in 2009/10.

Figure 6

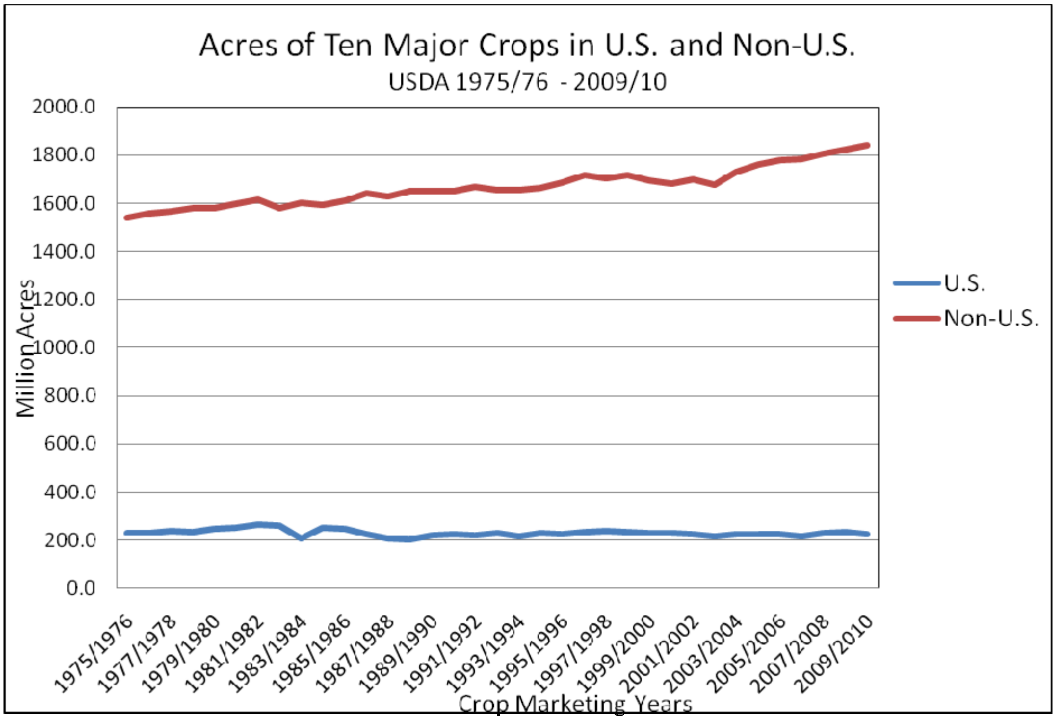
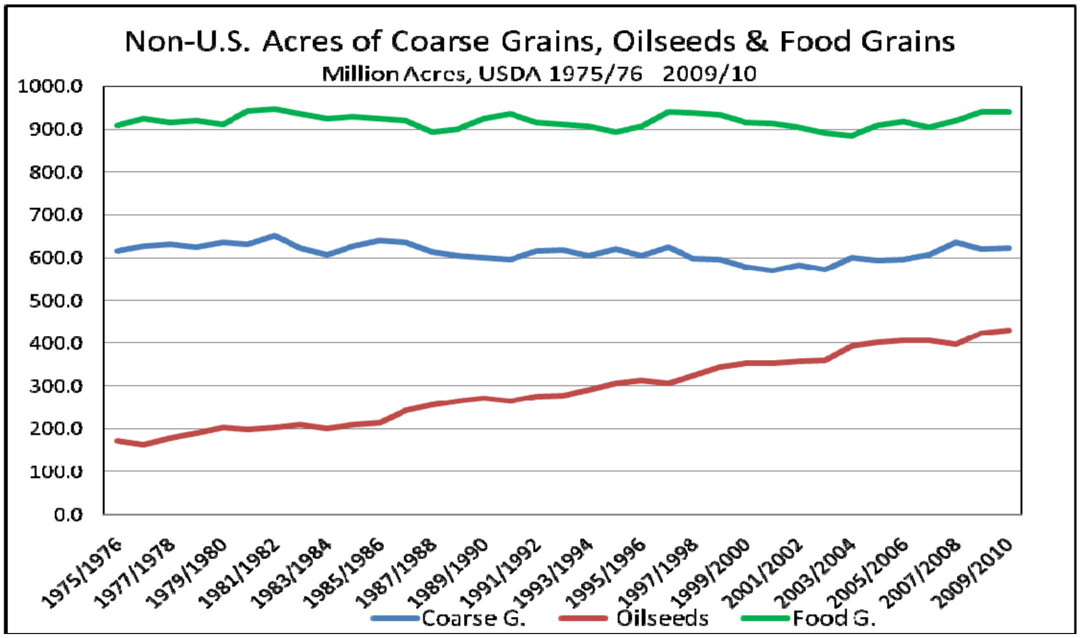


Figure 7 shows the change in harvested area for the non-U.S. for major categories of the ten crops. Harvested areas for food grains (wheat and rice) and coarse grains (corn, barley and sorghum) have been flat for the past 35 years at 919 million acres and 611 million acres, respectively, with some year-to-year variations. Cotton has ranged from 75 million to 85 million acres. The uptick in food grain acreage in the last two years is mostly due to higher wheat acreage responding to high wheat prices after the two short EU crops in 2006 and 2007. Some of that land is expected to shift to coarse grains and oilseeds over the next few years if wheat stocks remain adequate and other crops offer a better market return.

The big increase in area harvested outside the U.S. has been in oilseeds (soybeans, peanuts, rapeseed and sunflowers) from 173 million acres in 1975/76 to 423 million acres in 2008/09. That was caused mostly by the strong demand resulting from rapid economic growth in Asia. USDA projections of trade for the next ten years in soybeans and soybean meal and oil indicate that trend is likely to continue years. World soybean trade is expected to increase from 79.4 million metric tons (MMT) in 2007/08 to 106.0 MMT by 2018/19, while soybean meal trade is expected to increase from 55.3 MMT in 2008/09 to 75.9 MMT in 2018/19 and soybean oil from 10.8 MMT to 14.1 MMT. The three combined are expected to increase from 145.5 MMT in 2007/08 to 196.0 MMT in 2018-19, a 34.7 percent increase.

Figure 7

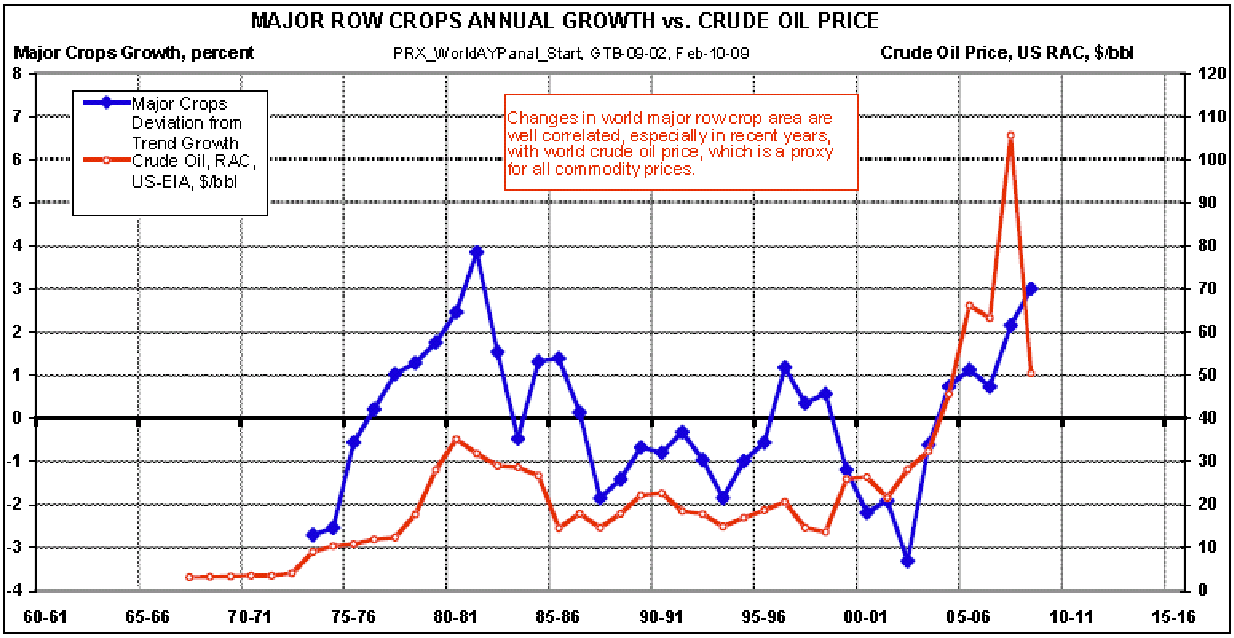


Growth in acres of oilseed crops over the last 35 years has overshadowed changes in coarse grain production, mostly corn. In relative terms, changes in coarse grains acreage have been insignificant in international land use change inside and outside the U.S.

Increases in worldwide crop acreages also cannot be separated from other broader worldwide economic forces. Figure 8 compares the annual percent change in worldwide acreage of major row crops with the price of petroleum in the U.S. The price of petroleum is a proxy for economic growth and monetary/financial policies that impact market prices for all raw materials including agricultural products.

When petroleum prices went sharply higher in the 1970s, land devoted to the major crops increased at an above trend rate as agricultural commodity prices increased. When petroleum prices were in a downtrend in the 1980s and 1990s, the rate of increase in land use for the major crops was below trend. The increase in the price of commodities in this decade as measured by petroleum prices has again set off an increase in major cropland at an above trend rate. If commodity prices are in a period of consolidation in the immediate years ahead, which appears likely based on events of the past year, the increase in major annual crop land in the world is likely to again fall below trend.

Figure 8



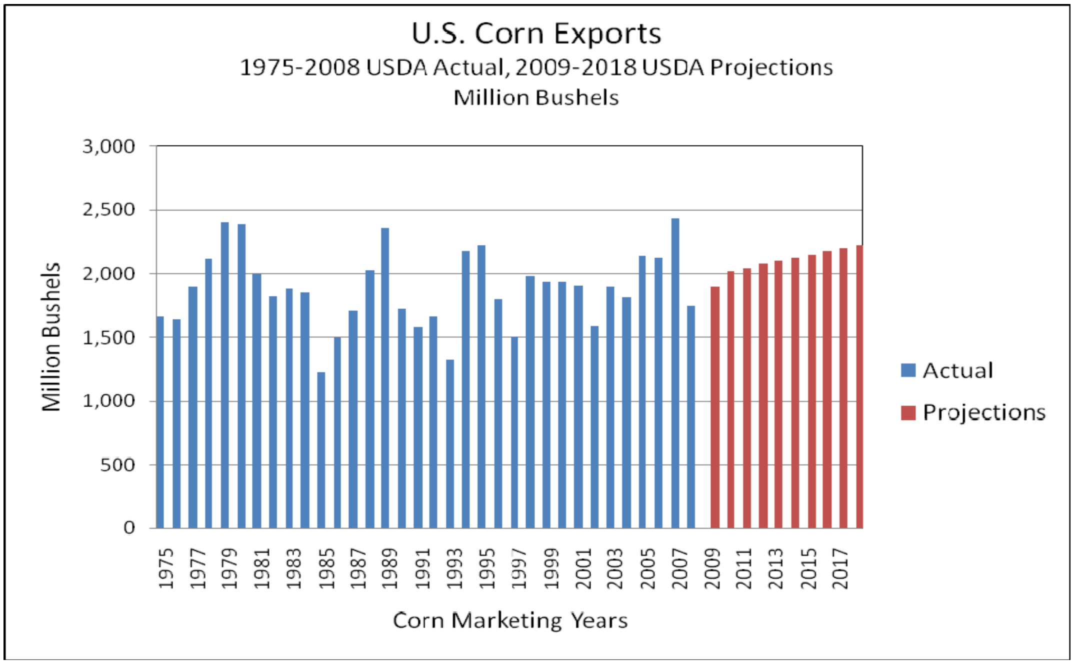
Economic forces far beyond ethanol production in the U.S. have driven land use change in recent years.

U.S. Corn Exports

The land use change issue begins with the idea that U.S. domestic production of ethanol reduces U.S. corn exports. Figure 9 shows U.S. exports by crop marketing year from 1975 to 2008 and USDA projections for 2009-2018. U.S. corn exports have been in a sideways pattern since 1975 in a range of about 1.4 billion bushels to 2.4 billion bushels per year with an average of 1.9 billion bushels. The record corn exports in 2007 of 2.44 billion bushels was caused mostly by two years of reduced wheat crops in the EU that resulted in less wheat used for livestock and poultry feed and increased imports of corn. U.S. exports for 2008 are estimated by USDA at 1.8 billion bushels, down 26 percent from 2007.

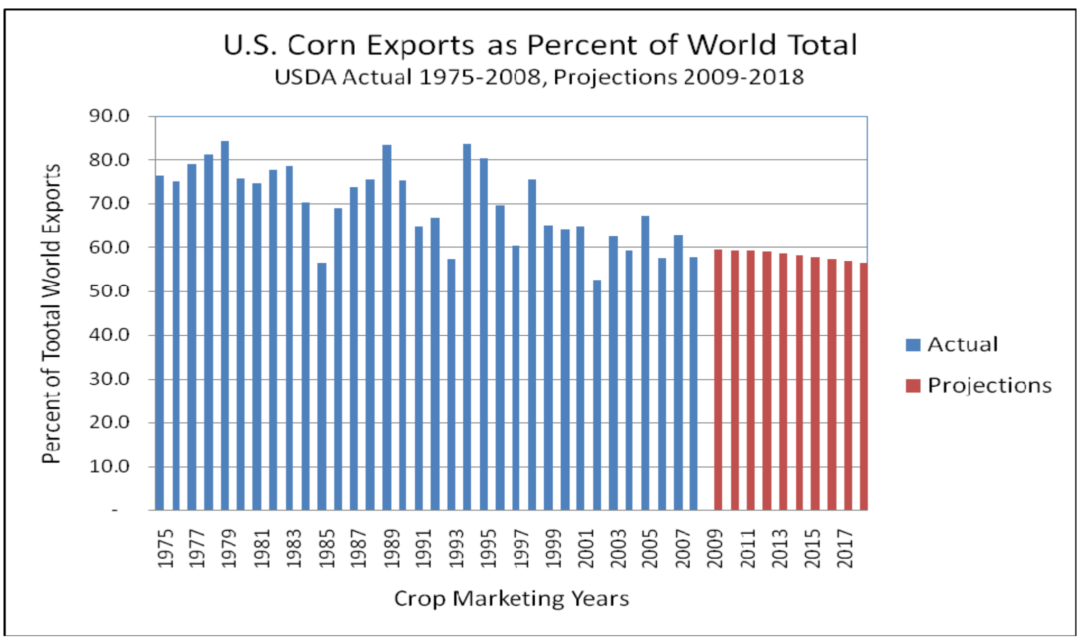
USDA's projection for 2009 is at the 34-year average of 1.9 billion bushels. The projections for 2010-2018 show exports increasing by 25 million bushels per year to 2.25 billion bushels by 2018. While exports could be higher than the USDA projections in any one year, as occurred in 2007, there is no major new market emerging for corn exports in the years immediate ahead that would change overall market demand. USDA expects that the record world corn trade in 2007 of 98.8 million metric tons (MMT) will not be exceeded until 2018.

Figure 9



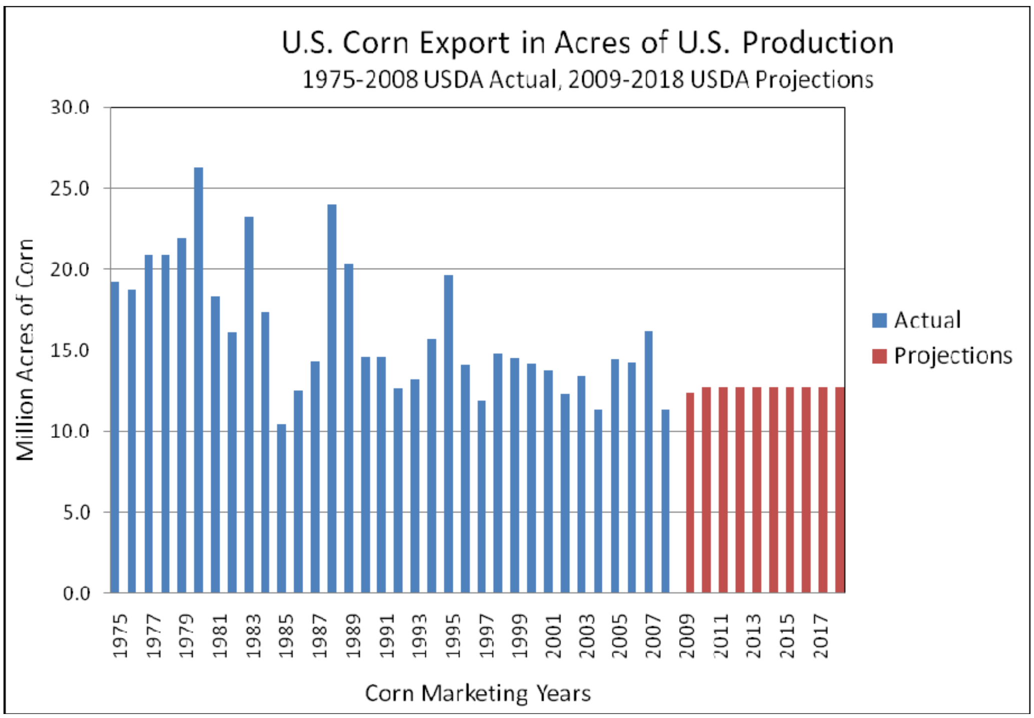
A logical concern could be raised that the world market could be growing rapidly, but the U.S. is not gaining much of that market because corn is being bid away for domestic ethanol production. Figure 10 shows the U.S. share of world corn trade from 1975-2008 and USDA projections for 2009-2018. The U.S. share had been on a general downtrend before ethanol production started to increase and USDA expects that down trend to continue at a slower rate over the next ten years.

Figure 10



While corn exports have been trending sideways for the last 35 years, U.S. corn yields per acre have continued to increase. Corn exports on a per acre basis have been going down, freeing up corn acres for other uses or depressing market prices when those new uses have not developed. Figure 11 shows the acres of corn exported for 1975 to 2008 and expectations to 2018 based on USDA long-term yield projections. Yield increases on the acres exported are expected to just about match the increased exports leaving acres of corn exported unchanged at 12.7 million. If yields increase at a fast rate than projected by USDA, acres used for exports would decline further or the amount of corn exported could increase without increasing the acres of corn used for exports.

Figure 11

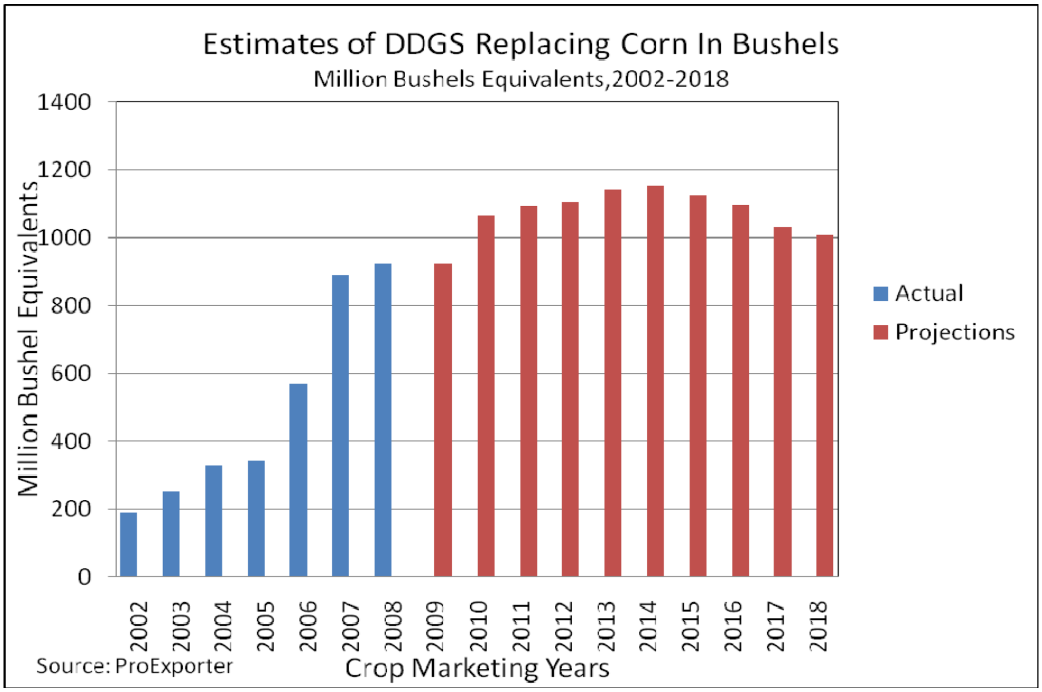


The Role of DDGS

Often forgotten in analysis about domestic feed markets and exports of feed is that distillers dried grains with solubles (DDGS), a co-product of ethanol production, has become a bigger portion of the feed supply as ethanol production has increased. For each bushel of corn used to produce 2.8 gallons of ethanol about 15 pounds of DDGS is produced. DDGS production has grown from 3.3 million metric tons in 2002/01 to 23.8 million metric tons in 2008/09.

USDA and other government agencies do not publish regular estimates of DDGS production and the amount used in livestock feed. The Bureau of the Census does publish exports of DDGS. The ProExporter Network has made estimates of the amount of DDGS available for livestock feed since the 2002 marketing year with projections for the 2009-2018 corn marketing years as shown in Figure 12.

Figure 12



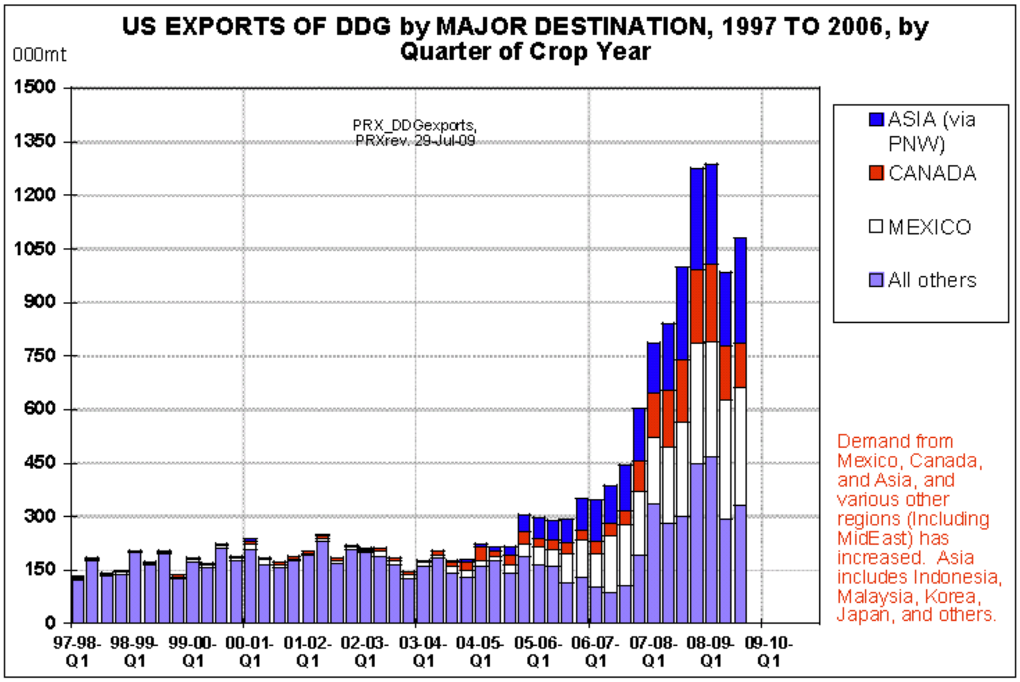
The biggest growth in DDGS production has already occurred. The combination of corn feed and residual and DDGS available for livestock feed will total almost 7.0 billion bushels by the 2018 corn marketing year. This should be an adequate feed supply to meet domestic meat demand and provide for growth in meat exports.

DDGS is a nutrient dense product with 30 percent protein that makes it ideal for exporting long distances. Exports have increased from 0.8 million metric tons in 2000/01 to 3.4 million metric tons in 2008/09. See Figure 13.

According to a study from Argonne National Laboratory in 2008, a pound of DDGS will replace 0.955 pounds of corn or 0.291 pounds of soybean meal. Feed producers in Asia have been particularly interested in DDGS because they have access to starch feeds that are low in protein and other essential nutrients. They can use the higher protein in DDGS to offset the lower protein content in the starch component of the feed ration and use soybean meal to completely balance the protein content.

Shipping DDGS in containers has also allowed efficiencies in international transportation linking individual ethanol plants with feed mills in Asia that are not capable of using large volumes of feed components. This “backhaul” compliments the movement of consumer goods from Asia to the U.S. using existing port facilities in the U.S. and Asia.

Figure 13


US EXPORTS OF DDG by MAJOR DESTINATION, 1997 TO 2006, by Quarter of Crop Year
000mt
1500
1350
1200
1050
900
750
600
450
300
150
0
PRX_DDGexports, PRXrev. 29-Jul-09
97-98-Q1
98-99-Q1
99-00-Q1
00-01-Q1
01-02-Q1
02-03-Q1
03-04-Q1
04-05-Q1
05-06-Q1
06-07-Q1
07-08-Q1
08-09-Q1
09-10-Q1
ASIA (via PNW)
CANADA
MEXICO
All others
Demand from Mexico, Canada, and Asia, and various other regions (Including MidEast) has increased. Asia includes Indonesia, Malaysia, Korea, Japan, and others.