

P.A.E.R. **PURDUE AGRICULTURAL ECONOMICS REPORT**

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DECEMBER 2015

Outlook for the Agricultural Economy in 2016

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INTRODUCTION

Chris Hurt, Editor



Farm incomes have taken a sharp hit! It feels like a new era for U.S. agriculture so, in these articles, we give our reasons why we believe that is the case. Many of the economic drivers that stimulated crop incomes have now turned more negative. First world production of major crops have exceeded world consumption for multiple years now and as a result, grain inventories have moved much higher. Second, the overall biofuels growth rate has slowed. Third, income growth rates in developing economies such as China have slowed. Fourth, a weak U.S. dollar in the boom years stimulated high agriculture prices, but now the dollar is strong and this is causing negative trade impacts which tend to weaken agricultural prices. Fifth, agriculture's boom period was also stimulated by monetary policy that kept interest rates abnormally low adding to more profitability in agriculture and contributing to higher land values and cash rents. Now the FED appears ready to shift toward higher interest rates, perhaps for several years to come. Higher interest rates could strengthen the dollar even more and further damage trade prospects. Higher interest rates will also increase agricultural production expenditures thus cutting profitability, and they are likely to contribute to lower land values.

Our overall belief is that agriculture will not go through a bust like the 1980's, but rather a period of moderation. This period will be characterized by the need for crop agriculture to adjust back to a more

normal economic environment. Animal agriculture is also going through the adjustment back to more normal feed prices. This has meant a relatively rapid expansion of animal product production in 2015, with even higher production in coming years. This higher production will tend to lower animal product prices and tighten producer margins.

The chart of farm income tells the story. U.S. farm income from 2011 to 2014 averaged \$105 billion a year with record income in 2013 of \$123 billion. Crop incomes were dropping quickly in 2014, but incomes from animal production were at record highs. Now in 2015, crop incomes have continued to drop and the buildup of production in the animal industries has lowered those incomes as well. Farm income fell to just \$56 billion which is approaching half of the average incomes from 2011 to 2014.

Income prospects appear weak for 2016 with continued weak crop prices and lower animal product prices compared to 2015. Production agriculture will need to continue to make adjustments in which they "tighten the belt" and strive to drive costs per unit lower. In addition, they should plan on several years of these adjustments. The financial positions of many in agriculture are expected to be under pressure with the possibility of negative cash flows and with the potential for declining asset values.

U.S. ECONOMIC OUTLOOK: SLOW BUT STEADY AHEAD!

Larry DeBoer, Professor of Agricultural Economics



The expansion after the Great Recession is almost six and a half years old. That makes it the fourth-

longest expansion since World War II. It has been slow going, though. Gross Domestic Product grew

2.0% above inflation during the past year. We have not seen annual growth above 3% or below 1.5% during the whole recovery. So, it has been one of the steadiest six-year periods in the past 70 years.

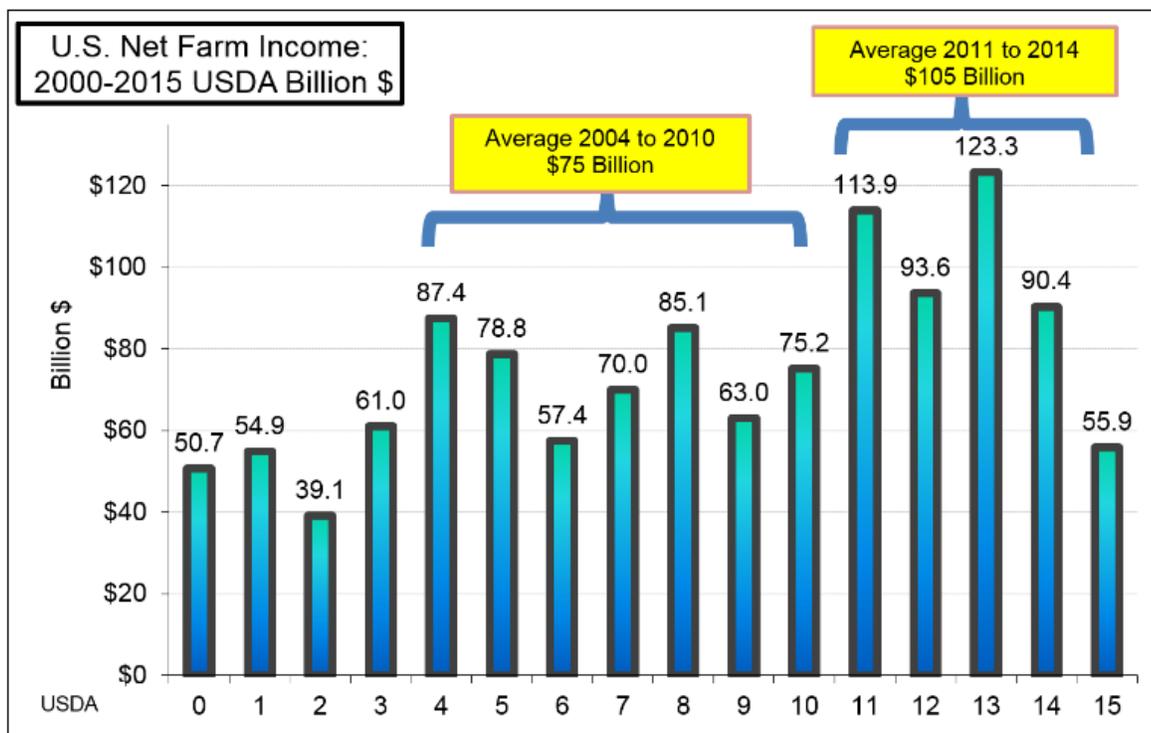
The economy might grow faster over the next year. Consumers have reason to spend more. Job prospects have improved, home prices have risen, gas prices have dropped and consumer confidence is up. Over the past year consumers stepped up their purchases, with consumption growing 3.2%.

Home construction has done better, too. The stock of homes for sale remains low, and home prices have been rising. That means there are incentives to build. Residential construction has been the fastest growing part of GDP over the past year. Building permits have leveled off since spring, though, which may indicate a pause in housing construction growth in the near future.

Now for economists' favorite phrase: "on the other hand." Business equipment investment has grown slowly. Declining capital goods orders this year mean growth is unlikely to increase. Business structure investment has dropped, which may be due to cutbacks in new oil drilling. Neither the federal nor state and local governments are buying much more either.

Overseas, China's growth has slowed, Europe's is slower, and Japan and Brazil are in recession. The world's spending for our exports will not be rising

very much. The value of the dollar is up against most currencies, and that makes our exports more expensive for the world to buy. That discourages exports and encourages U.S. consumers to buy more



imported foreign goods (rather than buying products produced here).

Add it all up and there's not much reason to think that the economy will accelerate next year. Consumers are spending, though, and they make up the lion's share of the economy. Expect real GDP to grow about 2.3% in 2016.

The unemployment rate was 5.0% in November, down from 10% in October 2009. In the past, slow GDP growth could not have brought the unemployment rate down so far. However, the labor force is growing more slowly now. Boomers are retiring, fewer millennials are entering, and a large number of potential workers are still feeling discouraged. With fewer job searchers entering the labor force, slower growth creates enough new jobs to bring the unemployment rate down. The unemployment rate has less room to fall now that there are fewer unemployed people, and better job prospects may draw more discouraged workers back

in. That means a small drop in the unemployment rate by the end of next year, to around 4.8%.

The inflation rate over the past year was just 0.1%, measured by the Consumer Price Index. It was that low mostly because of the gasoline price drop. Not counting oil, the “core” inflation rate was 1.9%, which is near the rate of the past few years. There is less slack in the economy, so businesses may see some rising costs, maybe even rising wages. Expect the core inflation rate to rise to 2.2% for the next 12 months.

The Federal Reserve has held its federal funds interest rate near zero since the end of 2008. They have been hinting strongly that they will raise the rate soon. Still, with growth slow, inflation low and

the dollar’s exchange value rising, they will probably be cautious. My outlook is for a three quarter-point increases over the next year, which would put the federal funds interest rate and the three-month Treasury bond rate at 0.75% by late 2016. Likewise, the 10-year Treasury interest rate should rise by about three-quarters of a point, to 2.8% to 3.0%.

But, what if the Greeks and Germans get at each other’s throats again? What if China implodes? What if Wall Street panics at the first sign of a Fed rate hike? Any of these “shocks” could cut growth and increase unemployment.

What’s the best guess, “slow but steady for another year.”

WEAK AG TRADE OUTLOOK DRAGS FARM INCOME

Philip Abbott, Professor of Agricultural Economics



U.S. agriculture is experiencing large reductions in the number of dollars generated from sales of Ag exports. The reduction in export sales is a key influence on sharply lowering U.S. farm income. After setting records in fiscal years 2013 and 2014, U.S. agricultural exports have fallen to \$139.7 billion in 2015; \$12.6 billion lower than in 2014. Agricultural exports are projected to fall another \$8.2 billion dollars in fiscal 2016, to \$131.5 billion, according to USDA’s latest trade outlook, published in December (ERS, 2015). Declines of this magnitude will likely put downward pressure on 2016 farm incomes.

Grain and feed exports fell \$4.8 billion from 2014 to 2015 and were expected to fall an additional \$3 billion in 2016. Oilseed exports fell \$3.2 billion from 2014 to 2015, and were projected to decline another \$5.4 billion in 2016. Livestock, dairy and poultry exports fell \$4.5 billion in 2015, and are projected to fall another \$1.1 billion in 2016. These reductions are largely attributable to lower commodity prices but, wheat and corn volumes were also down in

2015 but soybeans were higher. Estimates for 2016 are for lower volumes of corn and soybeans but for some slight increases in meat volumes.

Contributing to the weak export outlook are weekly export sales reports available from USDA (FAS, 2015). Corn export commitments are now lower than in any of the previous five crop years, except the 2012/13 drought year. Soybean export expectations are better, but weekly commitments are nevertheless lower than for the previous two crop years. While the weekly pattern of exports can vary, so these are imperfect predictors, they are further evidence that stagnant export volumes are contributing to low prices and expectations of larger carryout stocks. The November WASDE reports do not reflect these low weekly sales data. USDA WASDE estimates are down only 4% for corn since August, and soybean exports are the same as in August, while weekly commitments are down 24.9% for corn and 16.9% for soybeans. The weekly data show weakness in both quantity and price for key

export commodities and may lead to USDA lowering current export volume estimates even more for corn and soybeans.

Two important factors contributing to this weak agricultural export outlook are weak economic performance abroad and the extremely strong exchange rate of the dollar. While IMF projections of the U.S. economy are for somewhat faster growth in 2015 and 2016, projections for other advanced economies as well as for emerging and developing economies were mostly lower (IMF, 2015). Their projection is for Chinese economic growth to be only 6.8% in 2015 and 6.3% in 2016.

This economic outlook has contributed to the rising dollar. Relative to the Euro, the dollar appreciated 19% in the past year and is expected to appreciate another 1.7% in 2016 (by USDA). From November 2014 to November 2015, the dollar appreciated 8.6% in real, inflation adjusted terms. The dollar also strengthened relative to other currencies. According to the USDA agricultural exchange rate index, weighted by U.S. trading partners and competitors, the dollar appreciated 9.4% from November 2014 to November 2015 (ERS, 2015e). Over this same period, the dollar has appreciated relative to the Brazilian real by 40% after adjusting for inflation.

In its October Economic Outlook Update, the International Monetary Fund (IMF) highlighted the longstanding relationship between exchange rates and commodity prices (IMF, 2015). This relationship is well known to the U.S. agricultural community: When the dollar is strong, U.S. agricultural prices tend to be low. The strong dollar is likely an important factor contributing to weak agricultural exports. While prices may seem low to U.S. farmers, they are not as low for overseas customers or competitors.

Will the recently negotiated trade agreement immediately improve the trade outlook? The U.S. just concluded negotiations for the Trans Pacific Partnership (TPP) in October. There is a WTO Ministerial meeting in Nairobi, Kenya in December,

and the U.S. is continuing to aggressively negotiate the Trans-Atlantic Trade and Investment Partnership (T-TIP) with the European Union. There is much excitement and strong support for TPP by the U.S. agricultural community. According to USDA, the greatest potential agricultural benefits from free trade among TPP members are in dairy, meat, feed and rice, with concession by Japan and Canada being especially important.

Like any recent trade agreement, TPP falls short of free trade, as tariff rate quotas and other "side deals" limit the extent of liberalization. Work remains to accurately evaluate the complex agreement, and more importantly, the agreement must be ratified by Congress as well as by legislatures in other TPP member countries. Even limited concessions can be politically contentious, and the provisions of TPP do not go into force until at least six countries have ratified the agreement. Early indications are that these agreements can be positive for several U.S. Ag segments, but passage is not assured and generally, implementation of changes is slow, perhaps over a number of years.

In summary, weak export demand is key to recent agricultural price declines and lower farm income forecasts. Global economic weakness and a strong dollar mean agricultural trade will not turn around quickly. In spite of lower prices and good crops this year, agricultural exports are likely to remain weak for the coming year. Moreover, new trade agreements will probably do little to immediately raise export prospects.

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IS THE 2014 FARM BILL WORKING?

Roman Keeney, Professor of Agricultural Economics



High farm income and deep federal budget deficits set the stage for the 2014 Farm Bill negotiations. Two objectives were voiced in that process – eliminating fixed direct payments and contributing to deficit reduction. Now, weak farm income has brought the policy focus back asking if the new commodity programs which replaced direct payments will suitably support the farm sector. A recent [Policy Pennings by Schaffer and Ray](#)¹ claims the 2014 Farm Bill is failing to deliver adequate assistance in the time of greatest need, noting that farm payments are forecast only slightly higher in 2015 than in 2013's record farm income year, yet farm income is down over 50% (farm income dropped \$67.4 billion from 2013 to 2015). That article concludes that for all their faults, at least direct payments did not decline in years of low farm income.

Any discussion of the effectiveness of the 2014 Farm Bill must begin with the budget environment. Beginning with 2011's super-committee budget reform process, the Senate and House Agricultural committees were tasked with finding deficit reductions from federal farm and nutrition programs. The final score of the Farm Bill identified some \$1.7 billion (approximately 2%) in annual savings relative to continuing previous farm and nutrition programs. In some respect, success of the 2014 Farm Bill will have to be judged on whether real spending on farm and nutrition declines over the life of the bill. Current projections indicate that

commodity program spending will exceed the baseline forecast for payments, thus eroding the contribution to deficit reduction that were calculated at time of passage.

Federal budget reform remains a significant issue and continues to pressure agricultural spending, with crop insurance serving as the new target for cuts². Current legislation under debate [would trim nearly \\$2 billion dollars per year](#) in projected spending through elimination of the harvest price option, cutting premium subsidies and limiting guarantees to insurers. While the prospects for that particular legislation is uncertain, the message is clear – agriculture continues to be a target for spending reduction. With this level of attention to the budget in Washington DC, it should be acknowledged that agricultural support might be lower than under previous legislation even as farm income falls precipitously.

However, this does not appear to be the case. Low farm crop incomes in 2015 are set to trigger large farm payments in late 2016, when the marketing year for 2015 crops ends and national average prices can be determined. This lag in support may stress cash-flow management, but income support is increasing as income falls.

The increased government spending on agricultural support in 2015 and 2016 is set to occur because of the 2nd consensus objective of the farm bill process,

¹ Schaffer, H.D. and D.E. Ray. 2015. "Farm income expected to plummet—current mix of farm programs of limited help," *Policy Pennings* (Oct 23 issue). Agricultural Policy Analysis Center, University of Tennessee, Knoxville.

² Brownfield Ag News. "New cuts to crop insurance proposed." November 5, 2015. <http://brownfieldagnews.com/2015/11/05/new-cuts-to-crop-insurance-proposed/>

eliminating direct payments. All of the programs newly created to replace direct payments are counter-cyclical, meaning that payments tend to increase as income falls. The Agricultural Risk Coverage – County Option (ARC-CO) program dominates Midwest signups for corn and soybeans and makes payments using recent revenue (specifically, a five year Olympic moving average of price and yields) as a benchmark. The swap of a fixed direct payment for a counter-cyclical revenue program that may incur large spending runs counter to the first objective of deficit reduction. Current farm programs function as supports that are not subject to annual appropriations and thus budget goals may be undercut by economic conditions that trigger larger payments than expected.

However, the nature of a program like ARC-CO is that persistent low revenues will deliver payments only for a short term (2 to 3 years). In this manner, they are designed to provide transition income to farmers as they adjust to new market realities. A recent [FarmDocDaily blog post](#) highlights this feature of the program, and encourages farm managers to begin planning for a declining stream of farm payments³. It will be important for policymakers to understand that farm program payments will likely rise for the 2015 crops but decline in the longer run. This may help to dilute some of the interest in cutting crop insurance or making major changes in the next farm bill.

So, we are left with the question of whether the 2014 Farm Bill's crop programs are working. The

preceding discussion does not identify any unintended or unforeseen consequences of new farm bill programs. Thus, at this early stage the simple answer is "yes", commodity programs are working for traditional Midwest and Indiana crop farms. Specifically, the ARC-CO program by design: a) provides growing support as income falls; and b) delivers that income support with a lag of approximately one year following harvest. As discussed in Zulauf and Schnitkey, farm management within the new program designs will require adjustments in planning and communicating those adjustments to associated lenders, landlords, etc.

The only qualification to answering "yes" is the likelihood of increased agricultural spending relative to the baseline forecast for the 5 years the 2014 farm bill is in effect (2014 to 2018 crops). The 5 and 10 year baseline forecasts are never correct, so the immediate realization is that any set of programs where spending depends on market outcomes can differ dramatically. Ironically, only the old direct payment program would succeed against the objective of matching baseline spending. The real test of the 2014 Farm Bill programs will be whether they deter the ad hoc supplemental support that so often accompanied direct payments in times of farm income stress. Will these programs provide enough support for farmers to adequately transition from higher to much lower incomes? This question will take longer to answer even as we assert that for now, the 2014 Farm Bill's crop programs appear to be "working as designed."

FOOD PRICE INFLATION REMAINS IN CHECK

Corinne Alexander, Professor of Agricultural Economics

Food shoppers are seeing a period of below average food price inflation, with overall food price inflation averaging about 2.0% in 2015, which is at the

bottom of the normal range between 2.0 and 3.0%. One major driver of the low food price inflation is the strong U.S. dollar that has several impacts: 1) food

³ Zulauf, C. and G. Schnitkey. 2015. "Understanding ARC-CO: Transition Assistance vs. Support Assistance." UIUC, FarmDoc Daily (5):220.

<http://farmdocdaily.illinois.edu/2015/11/understanding-arc-co-transition-support-assistance.html>

imports are much less expensive and this is evident for fresh fruits which are down between 1% to 2%; 2) exports of U.S. agricultural products are slowing which increases domestic supplies and puts downward pressure on prices. A second major driver of low food price inflation is ample global inventories for major cereal crops due to a favorable growing season in the United States and globally. Favorably high crop production and low feed prices lower prices for cereals and vegetable oils. In addition, lower feed prices are stimulating livestock expansion thereby helping to moderate retail animal product prices.

In October 2015, overall food price inflation was up 1.6% over the last year. Food price inflation is composed of expenditures at the grocery store and restaurants. Grocery store prices are much more sensitive to commodity prices. As of October, grocery store price inflation was a very low 0.7%, which reflects the lower prices for cereals, some of

the meats and fresh fruits. Restaurants price inflation was much higher at 2.9%, which is being driven by wage pressures since labor is the largest cost for restaurants.

Turkey and eggs are two notable food items that have had much higher prices this year due to supply challenges from avian influenza. By contrast, retail chicken prices are down about 1% on record domestic supplies because while avian influenza had a limited impact on chicken flocks, many countries instituted import bans on U.S. chicken due to the disease concerns. In addition, the pork sector is also experiencing deflation with retail pork prices down about 4% as the sector has recovered from the 2014 PED virus. While the beef sector is in an expansionary phase, consumers are seeing lower inflation for beef at the end of 2015 because of competition from the lower prices of both chicken and pork. Retail beef prices recently have only been about 1% higher than year-ago levels.

APPLYING THE BRAKES TO DAIRY PRODUCTION GROWTH

Nicole Olynk Widmar, Professor of Agricultural Economics & Michael Shutz, Professor of Animal Sciences

Total U.S. milk production in September 2015 was up only 0.4% over September 2014. This level indicates dairy markets in the U.S. have begun to realize some “braking” in production growth. Production growth was slower for September 2015 (0.4%) than it was for either July (1.3%) or August (0.9%). Thus, a slowdown in growth is a response to softer milk prices. The lower growth of production in September has led USDA to adjust fourth quarter 2015 production downward by 0.2 billion pounds. Milk cow numbers, as well as milk-per-cow projections were also lowered. ERS-USDA is now projecting the national milk cow herd at 9.310 million head (down 15,000 cows) and milk-per-cow at 5,525 (down 5 pounds).

The export outlook for U.S. dairy is not optimistic at this point. Numerous factors are negatively impacting dairy trade, including (but not limited to) the strong U.S. dollar, the slowing of the Chinese economy,

migration in Europe and the Middle East, and general political and the economic uncertainty in the Middle East and North Africa. Competition from producers in the rest of the world is intense. Especially difficult competition is coming from the European Union due to the embargo on sales to Russia and where the Euro has fallen 11% relative to the U.S. dollar in the past year making their products more price competitive. These factors are providing a pessimistic forecast for U.S. dairy exports.

Looking to the domestic market, USDA Agricultural Marketing Service reported average national wholesale prices for cheese, nonfat dry milk, whey, and butter from September to October. Cheddar cheese prices fell (from \$1.715 to \$1.697 per pound), as did the whey price (24.4 to 23.1 cents per pound). On the other hand, nonfat dry milk prices increased from \$0.801 to

\$0.895 per pound and butter rose from \$2.445 to \$2.573 per pound.

Relatively high stocks for cheese, butter, and nonfat dry milk have led to reductions in the 2016 price forecasts in the ERS-USDA November report. Stocks have risen substantially over the past year. September 2015 ending stocks were 23.1% higher for butter, 10.7% higher for American cheese, 17.8% higher for other cheese, 24.6% higher for nonfat dry milk, and 22.3% higher for dry whey than September 2014.

Milk prices have been falling. The all-milk price forecast for 2016 is currently \$15.95 to \$16.75 per cwt. compared to about \$17 in 2015 and near \$24 per cwt. in 2014.

Lower feed costs will be positive for margins. The ERS-USDA 2015/16 forecasted U.S. corn price is between \$3.35-\$3.95 per bushel, the soybean meal price is down to \$290 - \$330 per short ton, and the national average alfalfa hay price fell to \$157 per short ton. Thus, while milk prices are down, lower feed costs will help somewhat as dairy producers are currently staring down tight margins for 2016.

HOG PRODUCERS FACING LOSSES

Chris Hurt, Professor of Agricultural Economics



After low production in 2014 due to baby pig death losses from the PED virus, pork supplies rebounded upward by 7% in 2014. Producers have expanded the breeding herd by 1% in the past year, and thus pork production is expected to rise again in 2016 by an additional 2%.

Demand has been weak in late 2015 and 2016 as well. The strength of the U.S. dollar is encouraging increased imports of pork and live hogs from Canada, and exports have weakened as well. Greater imports and lower exports both contribute to greater supplies of pork for U.S. consumers. Secondly, the announcement by the World Health Organization in which they linked bacon and processed meat consumption to human cancer in late October seemed to negatively affect pork demand.

Live hog prices averaged about \$52 per hundredweight for the first three quarters of 2015, but dropped substantially in the final quarter to about \$44. Prices are expected to remain in the low-to-mid \$40s in the winter and then move upward to the low \$50s for the second and third quarters of

2016. Prices in the final quarter of 2016 are expected to be in the mid-to-upper \$40s.

On the positive side, costs of production for 2016 are expected to be the lowest in six years dating back to 2010. Total cost of production is estimated at around \$50 to \$51 per live hundredweight. This is in sharp contrast to 2012 when costs were estimated at \$67 per hundredweight. Lower feed prices are the driver of lower costs. Annual U.S. corn prices dropped from \$6.67 per bushel in 2012 to \$3.69 in 2015. Soybean meal has dropped from an average of \$440 per ton in 2012 to an estimated \$310 per ton for 2016.

Returns turned negative in November of 2015 as hog prices fell to six-year lows. Losses in the last quarter of 2015 were estimated at \$18 per head. The industry is expected to experience losses of about \$20 per head this winter. Very small profits are anticipated for the second and third quarters of 2016, before returning to losses once more in the last quarter. For the entire year of 2016, modest losses of \$6 to \$8 per head are expected.

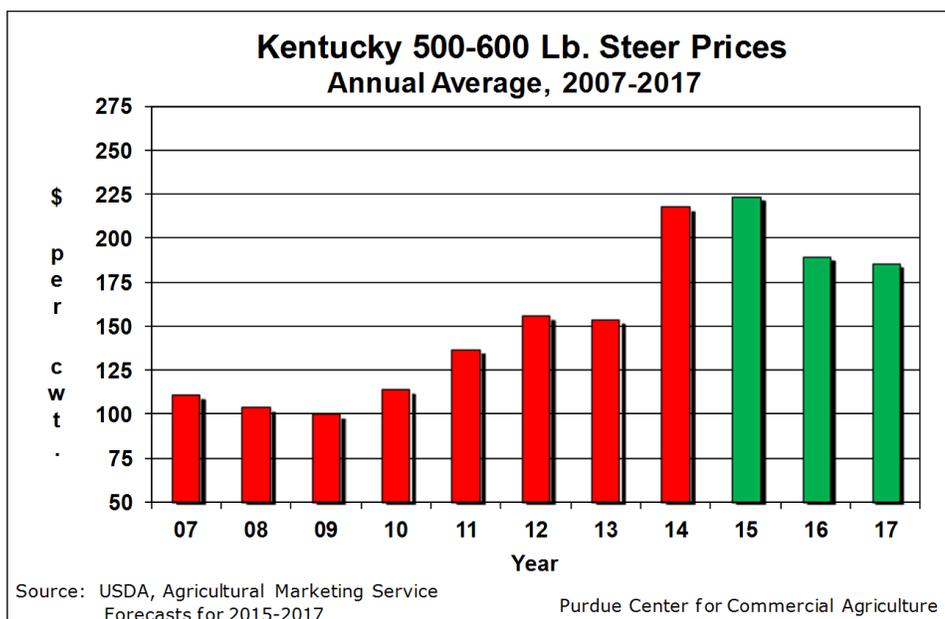
The industry needs to avoid any further expansion in 2016. Hog production is already large enough to

have driven hog prices below costs. Total meat supplies will continue to move up 3% in 2016 with chicken production up 2% and beef production surging by 5%. This means pork will face a lot of

competition in the meat case and the current anticipation is that the strong dollar will continue to be a negative for all meat prices.

BEEF CATTLE: A TUMULTUOUS YEAR

James Mintert, Director of the Center for Commercial Agriculture



It is an understatement to say that it has been a tumultuous year in the cattle markets. Weekly average slaughter steer prices in the Southern Plains started 2015 at \$170 per cwt. (live weight), but dipped into the low \$120's in late summer and early fall. The nearly \$50 per cwt. price decline was the largest within-year price decline on record. Steer calf prices also declined precipitously during the course of the year. Kentucky prices reported by USDA for 500-600 pound steers averaged \$251 per cwt. during 2015's first quarter, but the 2015 fourth quarter average (through the end of November) was just \$186 per cwt., a decline of \$65 per cwt.

The slaughter cattle price decline led to a bloodbath for cattle feeders. Iowa State Extension's estimates of Corn Belt cattle feeding returns indicate that a

program of routinely placing a 750 pound steer on feed each month and then marketing it approximately 150 days later yielded an average loss during 2015 of over \$200 per head. A cattle feeder following this simulated feeding regime would have absorbed losses during the fourth quarter of the year that were much worse than the annual average, approaching \$500 per head.

What led to the across the board decline in prices and, what are the implications for 2016?

Not surprisingly, more than one factor was behind the change in the cattle market during 2015, but the fact that meat supplies in the U.S. turned out to be larger than expected at the start of the year was key. Meat supplies in the U.S. have been declining for most of the last decade as animal agriculture responded to the loss of profitability arising from sharply higher feed costs by reducing inventories and production. During 2014, domestic per capita meat supplies dropped to about 202 pounds (retail weight), down from over 220 pounds as recently as 2007. A modest uptick in meat supplies was expected during 2015 as producers started increasing production in response to 2014 profits and to declining feed costs, but surprisingly meat supplies actually increased sharply. Total domestic retail weight meat supplies now look likely to exceed 210 pounds per capita during 2015, a year-to-year

increase of nearly 5%. Part of the increase in meat supplies was attributable to larger domestic production, especially of chicken, but that did not explain all of the change.

How did domestic meat supplies turn around so quickly? Meat supplies available to U.S. consumers consist of meat produced in the U.S., plus imports, minus exports. A change in the foreign trade balance had an unusually large impact on domestic meat supplies during 2015. A strengthening U.S. dollar made exports of U.S. products, including meat, more expensive to consumers in importing nations, encouraging them to look elsewhere for meat imports. At the same time, relatively high prices in the U.S., combined with the strength of the U.S. dollar, made the U.S. an attractive market for meat exporters around the world. As a result, net imports (imports minus exports) of beef into the U.S. are now projected to increase by nearly 1 billion pounds during 2015 compared to 2014, thereby boosting supplies available to U.S. consumers.

Added imports and reduced exports increased domestic beef supplies and heavy weights added to the tonnage. Through early fall, dressed cattle carcass weights averaged 826 pounds, nearly 3% heavier than a year earlier. The widely anticipated reduction in the number of cattle slaughtered during 2015 was partially offset by unexpectedly heavy carcass weights. Through November, cattle

slaughter was down more than 5% from 2014, but the increase in cattle weights meant that beef production declined by only 3%. When the impacts of increased imports and fewer exports are included, the amount of beef available per person was actually unchanged in 2015.

What is ahead in 2016? It seems clear now that the cyclical peak in both fed cattle and calf prices is behind us. Although the peak is behind us, odds favor prices remaining at historically high levels in 2016. Cattle slaughter is expected to start increasing cyclically during 2016 as producers have been holding back females to increase herd size, but cattle weights should stabilize, resulting in beef production that is 3% to 4% larger than in 2015.

Using USDA's publicly reported prices for Kentucky as a basis for comparison, the annual average price for 500-600 pound steer calves in 2016 is expected to average between \$170 and \$190 per cwt., which would still be the third-highest price average on record. Although calf prices in this range will be profitable for most Corn Belt cow-calf operations, the fact that we are in the expansionary phase of the cattle cycle provides a cautionary signal that calf prices will likely move lower in each of the coming years (see chart). This means cow-calf managers need to budget closely as they evaluate expansion plans, and they will obviously need to pay close attention to production costs.

GRAIN PRICES REMAIN DEPRESSED

Chris Hurt, Professor of Agricultural Economics



Two years of high U.S. yields for both corn and soybeans have contributed to low grain prices that are below total costs of production for many producers. More importantly, world annual corn and soybean production has exceeded annual consumption for the past four years. As a result, world inventories have been growing such that world

corn and world wheat inventories are expected to be at the highest level of the past 14 years. World soybean inventories are near the highest levels of the past 15 years.

In addition, the strength of the U.S. dollar is weakening grain and soybean price prospects. There are two ways the strong dollar is weakening U.S.

grain prices. First, a strong dollar means that the currencies of our foreign buyers are weak and have reduced buying power for U.S. farm products. China's currency has lost 4% of its buying power in the U.S. over the past year. More dramatically, Japan's buying power has dropped 12% and the Korean currency has dropped 15% in the past year. Secondly, the currencies of our export competitors are weak and this makes their corn, soybeans, and wheat more price competitive. As an example, the Brazilian currency has dropped 40% relative to the U.S. dollar in the past year and this makes their soybeans and corn much more price competitive compared to U.S. origin bushels.

Odds favor a sideways price pattern into the winter or at least until some event changes the overall excess supply situation. However, the price pattern and marketing strategies vary for corn and soybeans.

Corn prices are expected to increase in the winter and next spring by at least enough to cover on-farm storage costs. Eastern Corn Belt basis levels are expected to remain very strong especially in Indiana where low yields were dominant in the northern 2/3rds of the state. Cash prices are expected to be in the higher \$3's or lower \$4 range this winter. Spring and summer highs could then move to the very low \$4 to maybe around \$4.40 at ethanol plants. Farmer holding is expected to remain tight until cash prices reach, or exceed the \$4.00 per bushel mark.

Current corn bids suggest that the gain in price to next spring and early summer will be more than on-farm storage costs. This signal favors continued storage. When one decides to price, they should probably price for next summer delivery. The principal is to price for the delivery period that provides the most return above storage costs. This is called earning the carry in the market and is generally one of the best marketing strategies in periods of excess supplies.

Soybean price bids do not show much gain into next spring and summer. Current forward bids for winter

or spring do not cover the added on-farm storage costs to store that long. Cash bids in the Eastern Corn Belt are expected to be in the very high \$8's to about \$9.40 this winter. Then prices are expected to weaken in the late winter and spring, assuming South America has average or better yields. So, soybean price premiums for storage into late winter and spring are generally not enough to cover interest costs of on-farm storage. Strategies that tend to work well in markets where there are small price premiums for later delivery are to sell the cash grain now or at least into the early winter. Also, selling the soybeans now, or into January, and then re-owning those bushels in the futures market or with call options tend to be good strategies. The simplest strategy is to just hold beans in storage in anticipation of some price recovery. That works well for short term storage into this winter.

Weather in South America can affect prices this winter and depending on the nature of that weather can increase or decrease U.S. prices. The biggest impact would generally be on soybean prices, with corn moving in the same direction, but with a smaller magnitude of price change as compared to soybeans.

Current economic indicators favor less U.S. corn and wheat acreage in 2016 and more soybean acres. The reduction of corn acres is expected to increase 2016 corn prices by about 20 cents a bushel over 2015 crop prices. However, expected government payments for the 2016 crop will be lower. If so, this means that total revenues from the 2016 corn crop will be similar to the 2015 crop, and thus the best way to narrow the negative margins is to strive to drive costs lower.

Greater soybean acreage in 2016 may keep soybean prices depressed, maybe at levels that are not much different from for the 2015 crop. Soybean prices are thus also expected to stay below total production costs for the 2016 crop as well.

The current negative crop margin period is expected to last several years. Producer strategies in these tight margin periods include watching closely for any

price rally to sell more bushels. The current tight storing pattern suggest many producers are doing this. Secondly, striving to drive costs per bushel downward is always an important strategy. Generally, costs adjustments take time and producers should prepare for tight margins at least through the 2018 crop. Hopefully some progress will

be made each year in narrowing the current negative margins. By late this decade, producers will have adjusted their costs to be in better alignment with revenues. If so, U.S. agriculture will have worked through a cycle of boom, and then moderation, spanning from 2006 to 2020.

2016 PURDUE CROP COST & RETURN GUIDE

Michael Langemeier and Craig Dobbins, Professors of Agricultural Economics



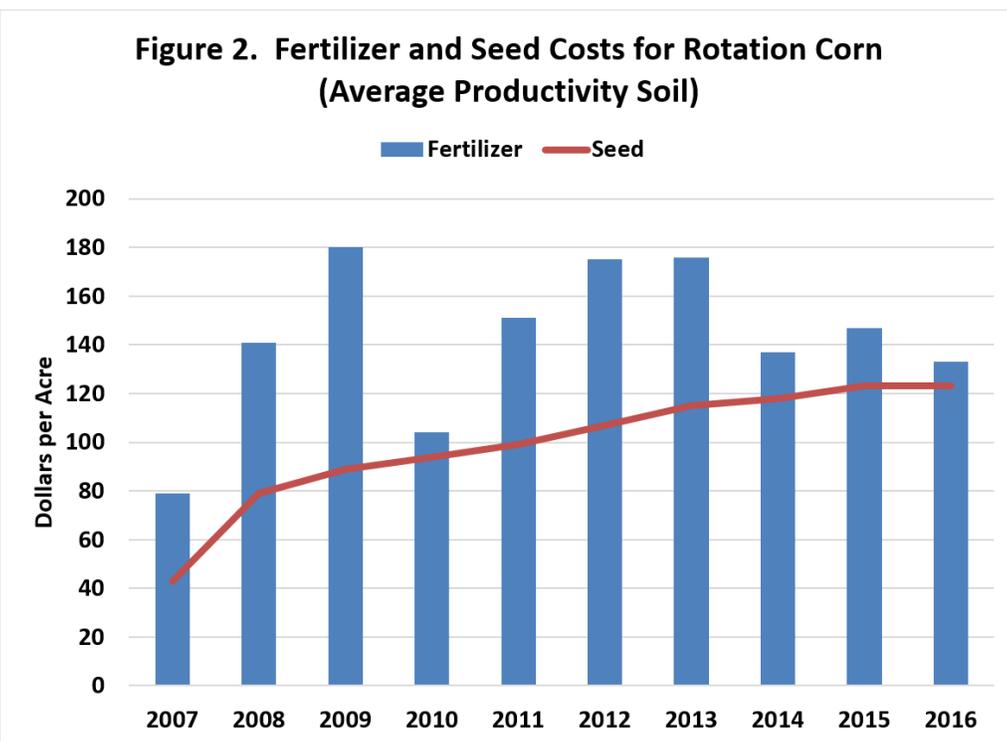
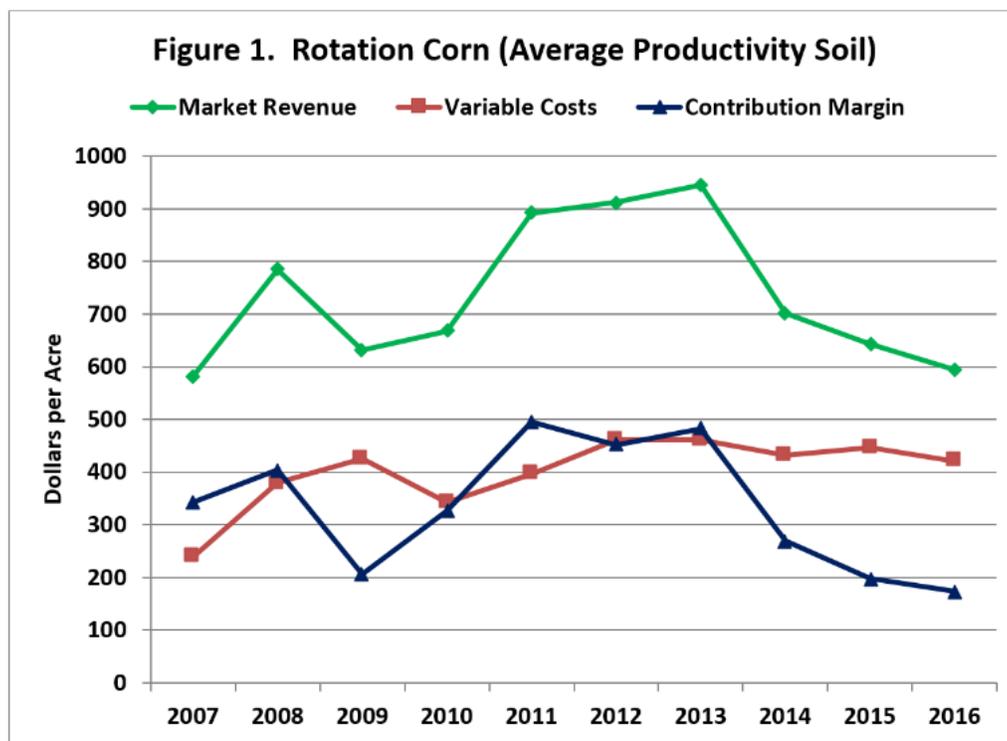
The 2016 Purdue Crop Cost and Return Guide, which is available free from the Center for Commercial Agriculture website, gives estimated costs for planting, growing and harvesting a variety of crops, as well as estimated contribution margins and

earnings. The guide is updated frequently as grain futures prices change and the costs of inputs, such as seed, fertilizer, pesticides and fuel, fluctuate. This paper discusses estimates made in late November 2015.

Table 1. 2016 Purdue Crop Budget for Average Productivity Soil.

	Continuous Corn	Rotation Corn	Rotation Soybeans	Wheat	Double-Crop Soybeans
Expected Yield per Acre	155	165	50	71	35
Harvest Price	3.60	3.60	8.60	4.60	8.60
Market Revenue	\$558	\$594	\$430	\$327	\$301
Less Variable Costs					
Fertilizer	148	133	52	75	38
Seed	123	123	74	44	85
Pesticides	42	42	26	12	25
Dryer Fuel	28	23	0	0	4
Machinery Fuel	16	16	10	10	7
Machinery Repairs	22	22	18	18	15
Hauling	16	17	5	7	4
Interest	12	12	6	5	6
Insurance and Miscellaneous	32	33	23	3	4
Total Variable Costs	\$439	\$421	\$214	\$174	\$188
Contribution Margin	\$119	\$173	\$216	\$153	\$113

See ID-166-W for more detail, November 2015 Estimates.



The guide presents cost and return information for low, average, and high productivity soils. The discussion here will focus on the estimates for average productivity soil. Table 1 presents crop budget information for continuous corn, rotation

corn, rotation soybeans, wheat, and double-crop soybeans for average productivity soil in Indiana. Double-crop soybeans are typically planted after wheat so it is typical to combine the contribution margin for these two crops when comparing to continuous corn, rotation corn, and rotation soybeans. The yield estimates in Table 1 reflect trend yields for Indiana for each crop. The contribution margin, obtained by subtracting total variable cost from market revenue, ranges from \$119 per acre for continuous corn to \$266 per acre for wheat/double-crop soybeans.

Figure 1 illustrates the trends in market revenue, total variable costs, and the contribution margin for rotation corn from 2007 to 2016. Market revenue in 2016 is expected to drop approximately 8%, due to the decline in corn prices. Variable costs are expected to decrease approximately \$25, primarily due to lower fertilizer and fuel costs. The trend in fertilizer and seed costs over the last ten years is illustrated in Figure 2. Fertilizer costs are based on price estimates in late November. The contribution margin for 2016 is expected to drop \$25 per acre (approximately 12%) and is expected to be the lowest since 2006. It is important to note that the contribution margin is used to cover overhead costs such as machinery

costs, family and hired labor, and rent. The inability to cover these overhead costs typically puts downward pressure on rents.

Trends in market revenue, total variable costs, and the contribution margin for rotation soybeans are illustrated in Figure 3. As with rotation corn, the

market revenue for rotation soybeans is expected to drop. Due to relatively lower fertilizer and fuel costs, total variable costs are expected to decline approximately \$10 per acre. The trend in fertilizer and seed costs for rotation soybeans is illustrated in Figure 4. The contribution margin for rotation

soybeans is expected to decline \$32 per acre (approximately 13%). The contribution margin for rotation soybeans is the lowest it has been since 2009.

From 2010 to 2013, the contribution margin for rotation corn was higher than the contribution margin for rotation soybeans. The average difference in the contribution margin was approximately \$50 per acre during this period. The relative attractiveness of corn during the last few years, encouraged many producers to plant relatively more corn than soybeans. The situation in 2014, 2015, and 2016 is considerably different. Soybeans had a relatively higher contribution margin in 2014 and 2015. For 2016, rotation soybeans are expected to have a contribution margin that is approximately \$45 per acre higher than the contribution margin for corn. Given the expected change in the relative attractiveness of corn and soybeans, producers should carefully budget both crops.

In the long-run, in addition to covering variable costs, producers need to cover the overhead costs associated with

Figure 3. Rotation Soybeans (Average Productivity Soil)

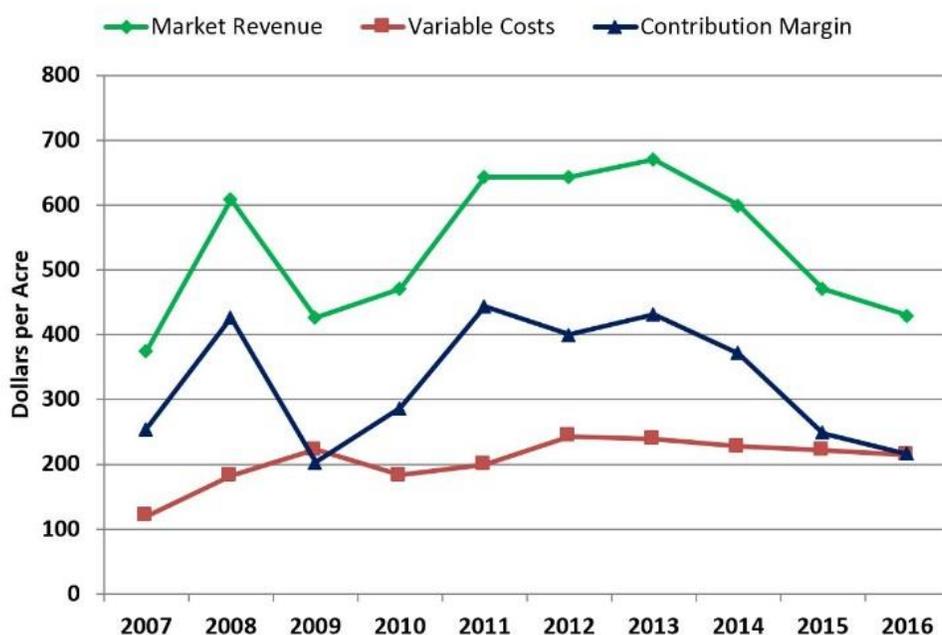
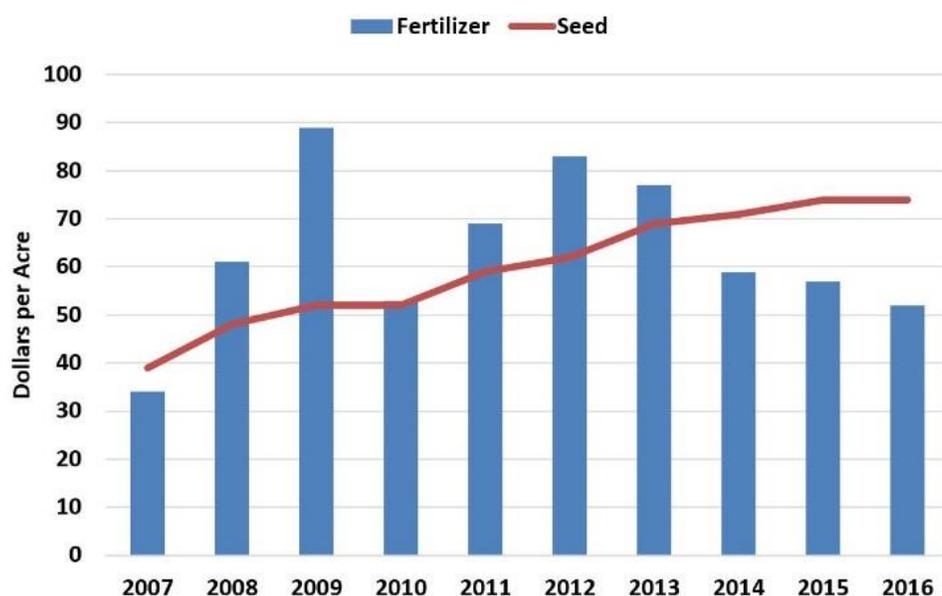


Figure 4. Fertilizer and Seed Costs for Rotation Soybeans (Average Productivity Soil)



machinery, family and hired labor, and rent. Even if a producer does not hire labor or rent land, they need to consider the opportunity costs associated with these items, which can be estimated by answering the following questions. What is the value of family labor if it was employed off the farm? Similarly, what could the land that I own be rented for?

The residual remaining after subtracting variable costs and overhead costs, which include the opportunity costs associated with family labor and owned land, from market revenue and government payments is called "earnings" in the Purdue Crop Cost and Return Guide. Over the long-run, we would expect the average earnings per acre to gravitate

towards zero. Figure 5 presents earnings per acre for a farm with 3000 crop acres that utilizes a corn/soybean rotation. From 2007 to 2015, earnings per acre ranged from a negative \$102 in 2015 to \$212 in 2011. Earnings per acre are expected to be a negative \$135 per acre in 2016, well below the ten-year average of \$48 per acre.

In summary, margins will remain very tight in 2016. This increases the importance of carefully scrutinizing input and crop decisions. Producers are encouraged to create crop budgets and in general improve their record keeping. Lower crop margins will adversely affect a farm's liquidity position and financial performance.

TIMES REQUIRE FINANCIAL MANAGEMENT & A GREAT LENDER

Michael Boehlje, Michael Langemeier & Ken Foster, Professors of Agricultural Economics



USDA recently estimated 2015 net farm income to be \$56 billion, a 38% decline compared to 2014. Government payments are projected to account for almost 20% of total farm income. Income has declined over 50% since its recent peak of approximately \$123 billion in 2013.

Prospects do not look much better for 2016. Current Purdue estimates of crop returns suggest large losses per acre if all costs of production are included. Prices of animal products are also expected to drop in 2016 with tighter margins.

Certainly, government programs in the form of crop insurance and farm program payments will continue to buffer the risk in farming, but they will not be as effective in reducing the downside risk as in the past. In particular, crop insurance revenue guarantees are substantially lower than during the high grain price years.

Financially, many crop operations already had negative cash flows in 2015 in which cash out-flows exceeded cash in-flows. That situation is expected

to continue for 2016 and some livestock enterprises are also expected to have negative cash flows. In fact, this narrow margin period could last for several years. So what are the implications of this reduced income period for the financial position and vulnerability of ag businesses and the conversations they will have with their lenders this year?

It's All About Working Capital

Maintain your working capital! Given the lower incomes and potential losses farmers are facing, lenders will be particularly concerned about the working capital producers will have to buffer these losses.

Working capital is the liquid funds that a business has available to meet short-term financial obligations. The amount of working capital a business has is calculated by subtracting current liabilities from current assets. Numbers can be obtained from your balance sheet. Current assets

include cash, accounts receivable, inventories of grain and livestock, inputs or resources to be used in production such as feed, fertilizer, seed, etc., and the investment in growing crops. Current liabilities include accounts payable, unpaid taxes, accrued expenses, including accrued interest, operating lines of credit, and principal payments due this year on longer term loans.

So how much working capital do you need? The answer to this question depends on both the risk and size characteristics of the business, and the volatility of the business climate. Larger businesses need more working capital, so it is best to determine the amount of working capital buffer relative to either gross revenue or total expense. A frequently suggested goal is a 15-25% buffer, or working capital that is 15-25% of gross revenue or total expense. A firm facing more volatility in the business climate needs a larger buffer. When margins for the firm are negative, these operating losses are typically covered by the use of working capital, resulting in a reduction in working capital (the speed at which working capital is reduced is often referred to as the "burn rate"). If margins are expected to be negative for more than a year or two, the burn rate on working capital may be relatively high, leading to a dramatic increase in the vulnerability to financial stress. Given the margin pressures and increased uncertainty that farmers are facing today, some suggest the working capital buffer should be 35% or greater in relation to gross revenue or total expense.

Lenders today are increasingly concerned about the "burn rate" on working capital. Given the expected losses noted earlier, even those who currently have strong working capital positions might find it deteriorating quickly over the next couple of years. For example if crop operating losses approximate \$100 per acre for the next couple of years, a relatively strong working capital position of \$400 per acre today (which is approximately 50% of expected gross revenue) can deteriorate to \$200 which is close to the level (approximately 25% of gross revenue) that lenders would consider vulnerable.

How can you manage your working capital? Managing working capital involves maintaining an adequate portion of the asset base that can be easily converted to cash, and/or controlling the short-term drains on that cash resulting from debt service, capital expenditures, or cash withdrawals. So one of the easiest ways to manage working capital is to protect cash. When the business generates cash from the sale of products, it can be held in that form, committed to the purchase of inputs for the upcoming production season, or it can be used to purchase capital items or be withdrawn from the business. Purchasing assets or withdrawing cash from the business may be necessary in specific instances. However, it is extremely important in today's environment to carefully monitor these uses of cash because their use can significantly reduce the liquid financial reserves of the business. Other techniques to preserve cash are to lease capital assets or hire custom services; to reduce expenditures that do not increase production; to improve yield through timely operations; and to sell at higher prices. Maintaining a strong cash position is an important way to manage working capital.

In addition to the drain on cash and thus working capital from asset purchases or withdrawals, the repayment schedule on debt also has a significant impact on working capital. Shorter repayment schedules on debt used to purchase capital assets such as land and machinery results in larger annual principal payments and reduced working capital. Extending the repayment terms through refinancing can reduce principal payments and thus the pressures on cash flows, leaving more working capital to be available to buffer financial stress. If adequate collateral is available, the debt might be restructured with some of the operating line added to the term debt so that it can be repaid over more years, thus reducing current debt obligations and increasing working capital.

Finally, it may be necessary to improve the working capital position by selling some capital assets – those that are not a critical part of the business such as a secondary farmstead or a vacation home might be

first on the list. Maybe some less productive land has potential for development purposes. Alternatively, excess machinery and equipment could be sold. This strategy is often not the first strategy pursued, but in situations in which cash is relatively short, it should not be excluded from the toolbox. When selling capital assets, it is important to consider capital gains and losses, and depreciation recapture, which may trigger a tax obligation resulting from the sale of assets.

Talking to Your Lender

Communicate—Visit early and often with your lender concerning any events that might have an impact on your ability to repay your debts. Often when things are not going well, there is a very human tendency to avoid confronting the problem. Producers under financial stress will often immerse themselves in the day-to-day operation of their farm and ignore the long-term decisions that must be made. This can manifest itself in not telling the lender that there is a problem until it is too late. Early warning will give you and your lender the opportunity to jointly explore alternative strategies. It will also establish a better relationship for future credit requests when the situation has improved.

Share Your Plans-- Share your plans to respond to financial stress, and have some evidence to support their expected success. A sound and convincing business strategy will increase your lender's willingness to extend additional operating credit, delay principal payments, or refinance existing debt.

Prepare Detailed Financial Statements-- Prepare detailed financial statements, and share them with your lender. At a minimum, this should include a current Balance Sheet, recent Income Statement, projected Income Statement for the next year, and Cash Flow projections. In this situation, it is important for the lender to be fully informed. The

lender has become a de facto partner in your operation. Advice that he or she might provide or changes in your loan arrangements will be conditional on your financial situation. In addition, evidence that you are hiding information will result in inflexibility of the lender and could jeopardize your relationship in the long term.

Discuss How You Will Control Risk-- Discuss the ways that you will control risk. A variety of risk-reducing marketing strategies exist which use futures, options, and forward contracts. While some of these limit the upside potential of price increases, they also can secure a steadier stream of income for farmers.

Other risk management strategies are contracts and joint ventures that share or transfer risk between multiple parties. It is important to note that no single party will be capable of bearing all of the risk in most cases. Thus, contracts should be written to allow re-negotiation of terms, should allow for variation in payments as market conditions fluctuate, or should share risk equitably between the participants. Such contract arrangements should be considered for leasing land as well as in producing livestock and crop products. Involvement in a contract where you shift all of the risk to someone else usually means that you have traded exposure to short-term price volatility for longer term risk of contract termination or default when price gets extremely low.

Agriculture is going through a period of downward adjustment that has important implications for the financial position of ag businesses. This period may last several years and managers need to understand their working capital position and how to manage it. Lenders will become increasingly important in helping firms to manage through these tight financial times. So communicate with your lender early, communicate with them in detail about your financial situation, and communicate with them about your plans to manage through these times.

WHY FARMLAND VALUES WILL DROP IN 2016?

Craig Dobbins, Professor of Agricultural Economics

Low or negative crop returns are exerting a negative influence on farmland values, but low interest rates, so far, have been a source of support. However, the Federal Reserve Bank has been positioning to raise interest rates and the odds seem quite high for them to start soon. If rates do move higher, this will be one more economic indicator that would cause weaker farmland values.

To show how falling returns and rising interest rates could impact land values, we use the simple capitalization model $V=r/((i-g))$ where V is the per acre value of farmland, r is the annual per acre net return to farmland, i is the interest rate, and g is the growth rate in the annual net return to farmland.

This simple model indicates a 10% decline in the net return to land will result in a 10% decline in farmland values if interest rates and the growth rate are unchanged.

To date, lower expected returns have likely been the major force weakening the farmland market. While there are still some reports of strong farmland prices, most broad surveys of farmland values in the Midwest consistently indicate that farmland values are declining. Because of different opinions in the marketplace, market values seldom adjust as quickly, or as precisely as the models forecast.

Purdue's Indiana Farmland Value Survey from June 2015 indicates that average Indiana cash rent for the 2015 crops was \$229 per acre. If we use .06 for interest rates and .03 for the annual growth rate (historical average), this model values average Indiana farmland at \$7,633 per acre ($\$229/ (.06-.03)$). However, if the interest rate were to rise by 10% to .066, then the model would suggest farmland would drop to \$6,361 per acre ($\$229/ (.066-.03)$). The 10% rise in interest rates, drops land values by 17%. This example illustrates that interest rate increases are likely to have a larger downward impact on farmland values than declines in expected net income.

More importantly, land values would be expected to fall more quickly in an economic environment of low returns in combination with rising interest rates. This appears to be the economic environment that agriculture will face in 2016.

Since there is a limited supply of farmland on the market, the downward adjustment process will continue to be slow. On a statewide basis, I expect farmland values to drop 5%-12% in 2016. Declines toward the top end of this range are more likely if interest rates begin to climb by early in 2016.

CASH RENTS CONTINUE TO ADJUST DOWNWARD!

Craig Dobbins, Professor of Agricultural Economics

What about cash rents? The Purdue Farmland Value and Cash Rent Survey reported a statewide decline in cash rents for the 2015 crop. This was the first statewide decline in our survey since 1987. In addition to the tight margins faced by farmers in 2015, the wet Indiana spring and summer weather in many areas of the state took its toll in the form of

lower yields. While some of the yield loss will be offset by crop insurance indemnities, these localized yield losses did not raise fall prices, and thus the crop insurance revenue floor was not nearly as strong as the 2012 Midwest drought. Even with normal yields, 2015 margins were very tight, or even negative. Those who suffered low yields are

generally facing an even more negative financial situation.

While fertilizer and fuel prices have declined from 2015 levels, inputs such as seeds and chemicals have remained steady. The Purdue 2016 Crop Cost and Return Guide indicates per acre direct costs for 2016 corn and soybean production will be a little less than 2015. These small reductions in direct costs, while helping to lower production costs are only a small fraction of the decline that has occurred in revenues.

It is also important to consider the implications of overhead costs. In the short-run, overhead costs are not tied to production levels. If production levels can be increased, this lowers per unit costs. A common strategy used for lowering overhead costs per unit is to spread fixed machinery and labor resources over more acres and thus more bushels of production.

The desire of farms to expand farm size by renting more land is one reason that the farmland rental market continues to be very competitive. It also makes farmers reluctant to give up leased farmland even when the current level of cash rent results in a loss.

Given expected low commodity prices next fall and the adverse weather events of 2015, the need to lower per bushel production costs in many regions of Indiana in 2016 is even greater than last year. In addition, grain futures markets are suggesting weak crop prices for multiple years. Given these commodity price expectations, it seems clear that there will not be sufficient revenue to sustain the high per unit cost of production that developed during the 2006 – 2013 period. Downward adjustments in input costs and cash rents occur slowly, but over time these adjustments do occur. Statewide, I expect 2016 cash rents to decline 4% to 8%.



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