

# PURDUE AGRICULTURAL ECONOMICS REPORT

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NEWS STRAIGHT FROM THE EXPERTS

## 2019 AGRICULTURAL OUTLOOK

DECEMBER 2019

| CONTENTS  | Page      |
|---|-----------|
| U.S. Economy Near Capacity Slows Growth Potential   | <u>2</u>  |
| The Administrations' Trade Policy: What It May Mean for the Future!                             | <u>5</u>  |
| Agricultural Policy Issues Make Some Progress   | <u>8</u>  |
| Retail Food Prices  | <u>10</u> |
| It's All Lower: Cow numbers, Total Milk Production, Forecasted Domestic Use and Milk Prices Too | <u>11</u> |
| Pork Industry Looking for a Better 2019   | <u>12</u> |
| Corn Prices Have Bullish Potential  | <u>14</u> |
| Soybean Prices Depend on China  | <u>16</u> |
| 2019 Purdue Crop Cost & Return Guide  | <u>18</u> |
| Cash Rents and Farmland Values Remain Under Downward Pressure                                   | <u>21</u> |

### EDITOR'S WELCOME NOTE

#### *2019 Agricultural Outlook*

*The 2019 farm economy is going to be influenced by several ongoing issues. Those include the global trade war; strong U.S. and world economies; favorable 2018 weather with record crop yields; and a new farm bill covering the 2019 to 2023 crops.*

*Trade disputes have been the top news issue in agriculture. Trade tensions have cooled somewhat but uncertainty remains with potential large implications in 2019. Conflicts with three of our largest Ag customers China, Mexico and Canada had negative impacts on several farm commodities. An agreement has been reached with Mexico and Canada (USMCA) but still needs to be approved in each country.*

*Chinese tariffs on U.S. Ag goods continue to have the biggest impact on the farm economy. There is currently an agreement to stop escalating the conflict at least for a few months. Trade concerns with China involve the fundamental way each country does business so will not be easy to resolve. Yet, both countries have strong*

*incentives to make progress toward a framework for working on these differences. Failure to resolve trade issues will be painful for U.S. agriculture. On the other hand a negotiated settlement could involve China buying even larger quantities of U.S. Ag products and be friendly to farm incomes in coming years.*

*The U.S. and world economies have provided a solid foundation for buying Ag products with low unemployment, rising wage rates and strong consumer confidence. There are already expectations for slowing income growth in the U.S. and the world. Agriculture will face higher costs for inputs like fertilizer, labor costs, machinery and buildings and higher interest costs.*

*While weather is still largely an unknown for 2019, the favorable 2018 weather provided record corn and soybean yields. Sales from the 2018 crops will lap over into 2019 and provide a foundation for stronger cropping income. Corn prices are expected to be higher as well and the government trade assistance on soybeans was a meaningful addition to farm revenues in late 2018.*

*Farmers and agribusiness managers will spend time in 2019 learning about the new farm bill and the decisions they will need to make. That legislation largely continues the last farm bill with safety net programs of crop insurance and commodity support by either revenue guarantees or price guarantees.*

*In these articles we provide you with the driving forces that will determine the 2019 farm economy.*

**- Chris Hurt, Editor and Professor of Agricultural Economics**

## U.S. ECONOMY NEAR CAPACITY SLOWS GROWTH POTENTIAL

**LARRY DEBOER, PROFESSOR OF AGRICULTURAL ECONOMICS**

Since March 2018 there have been more job openings in the U.S. economy than there are people searching for work. The limit on job growth is the availability of potential employees, not job opportunities. The U.S. economy has reached capacity.

Real GDP growth is limited by the growth of the labor supply and the growth of labor productivity. Both have grown slowly since the Great Recession ended. Baby boomer retirement has reduced average labor force growth to 0.5% per year, though it's been somewhat faster over the past year, at 1.0%. Productivity, measured as real gross domestic product per worker, has grown 0.9% per year since the recession. Productivity also has been edging upward lately, averaging 1.1% in the past year.



At capacity, employment can only grow as fast as the labor force plus productivity. So, we should expect real GDP growth of 1.4% based on rates of growth since the recession, or 2.1% using more recent growth rates.

Real GDP has grown faster than that, 3.0% over the past year. That's the highest annual growth rate during this expansion. The drop in the unemployment rate from 4.1% in December 2017 to 3.7% in November 2018 made this possible. When unemployment falls, employment grows faster than the labor force.

Consumer demand and the Federal budget deficit are the main reasons for the faster growth. Consumers increased their spending by 3% above inflation. Pay rose (modestly), home values in-

creased and taxes were cut. The Federal budget deficit increased from 3.4% to 4.7% of GDP. The increase is due to the December 2017 tax cut, and rising Social Security and Medicare spending for retired boomers.

Businesses stepped up their hiring to meet the added demand, driving the unemployment rate to a 50-year low. It's unlikely that the unemployment rate can fall much further and therefore employment growth will be limited by the growth in the labor force.

The labor force grows faster if labor force participation increases, and it has been rising. Participation has increased from 59.6% of the population last December to 60.6% now. This is lower than the 63.4% participation rate at the peak of the last expansion, and lower still than the 64.7% peak at the end of the 1990's.

Labor force participation has been trending lower. Women's participation peaked in 2000 at 60.3% of the population. It's down to 57.2% now. Men's participation peaked in 1949 (yes, during the Truman administration), at 87.4%, and it's down to 69.0% now. In each successive expansion, men's participation has never regained the previous expansion's high, in almost 70 years and 11 expansions. It would be news if it happened in this expansion. Labor force participation may edge upward with improving job opportunities, higher wages and lower income taxes, but this is unlikely to be an important source of growth.

Productivity has grown more slowly in the last ten years than at any time in the past century. Explanations are many. Perhaps we've reached the physical limits of many technologies. Perhaps the domination of high tech industries by a few big firms is inhibiting the spread of innovation. Perhaps it's an overhang from the financial crisis of the Great Recession, with both lenders and borrowers still reluctant to make loans and investments in risky projects. Perhaps slower population growth means that businesses see less need for innovations to expand capacity.

The December 2017 tax cut was intended in part to address this problem. The cut in corporate income taxes should increase returns on investment. Added investment would add to the capital stock, which would raise productivity. Investment as a share of GDP has lagged in this expansion. It peaked at 20.3% in the 1990's, and at 19.9% in the 2000's, but it's been up and down between 17% and 18% since the end of 2013. The rate has moved up a little since December, from 17.4% to 18.0%, so perhaps the tax cut is having some effect. The growth rate of capital goods orders has dropped since January, though, so an investment boom seems unlikely in the near future.

Federal Reserve policy is working at cross-purposes to the tax cut. The economy is already pressing against capacity limits, which risks higher inflation. Additional spending on investment increases this risk. The Fed has responded by raising interest rates, but this may partially offset the higher return on investment. The tax cut is expansionary. Federal Reserve policy is contractionary.



The Fed has increased the federal funds rate eight times since the end of 2015, with another quarter-point increase expected in mid-December. The rate is 2.2% now. The Fed is likely to take a "wait and see" attitude in 2019, judging whether to increase the federal funds rate three or four times based the direction of economic indicators. Lower unemployment and higher inflation would make for more increases. If

unemployment and inflation are stable, and financial markets are not, we'll see fewer rate hikes. The Fed regards a federal funds rate between 3% and 3.5% as neutral—neither expansionary nor contractionary. We'll hit that range with three quarter-point increases in 2019.

The Fed's target inflation rate is 2%, and inflation is near that target. The all-items consumer price index has increased 2.2% over the past year, the same as the "core" CPI, which excludes energy and food. Inflation is not a problem yet, which gives the Fed room to pause rate hikes if needed.

An economy straining at capacity should see rising inflation, but this depends in part on rising wages. Wages have increased by about one percent per year above inflation since the beginning of 2016. This is much slower than the 1.5% to 2.5% increases in the past two expansions. Perhaps slow productivity growth makes businesses reluctant to raise wages, even in the face of labor shortages.

An economy at capacity, contractionary monetary policy, a bigger Federal budget deficit and somewhat higher inflation explain rising interest rates. The yield on three month Treasury bills moves in lock-step with the federal funds rate, so it has risen from 1.3% last December to 2.3% in November. The 10-year Treasury bond yield has increased from 2.4% last December to 3.1% in November. Both interest rates are likely to trend upward in 2019.



Note that the shorter-term Treasury yield has risen more than the longer-term yield. The difference is narrowing. Recently financial markets were alarmed to see the yield on the 5-year Treasury bond drop slightly below the yield on the 3-year bond. Such yield curve inversions have been leading indicators of recessions in the past. The interest rate on the 3-month Treasury bill rose above the rate on the 10-year bond in advance of the last two recessions.

Our expansion is 114 months old this December. If it lasts through July 2019 it will be the longest expansion in U.S. history, surpassing the 10-year expansion during the 1990's. Expansions die of shocks, not old age, but shocks are by definition shocking—hard to predict. Possible shocks include a heightened trade war, weaker growth in China, a government shutdown or other political turmoil in the U.S., too-rapid interest rate increases from the Fed, a disorderly Brexit, or the bursting of some as yet undetected financial market bubble. It probably would take more than one shock to cause a recession. Leave an oil price hike off this list. Now that the U.S. is a major oil producer again, higher oil prices might help as much as hurt.

**What to expect in 2019?** If the labor force grows as it did in 2018, and productivity continues its slow upward trend, we could see real GDP grow 2.3%. The unemployment rate is unlikely to fall much further, especially as the effects of the tax cut wear off. Leave unemployment at 3.7% by the end of 2019. Inflation should increase, but with wages growing slowly and the Fed ever vigilant, core inflation should tick upward to 2.3%, with the all-items rate a little higher if OPEC and Russia cut oil production and oil prices rise. Interest rates are going up. The Fed likely will raise the federal funds rate above 3.0% by the end of 2019, with three, not four, quarter-point increases. The 3-month Treasury interest rate will rise by the same amount. The 10-year Treasury interest rate will rise less than that, but the guess here is it will not invert. Put the 3-month Treasury interest rate at 3.3% and the 10-year rate at 3.8% by this time next year. Slower growth, but no recession, so by mid-summer our expansion should become the longest in U.S. history.

## THE ADMINISTRATIONS' TRADE POLICY: WHAT IT MAY MEAN FOR THE FUTURE!

**RUSSELL HILLBERRY**, PROFESSOR OF AGRICULTURAL ECONOMICS

USDA is projecting agricultural exports of \$141.5 billion in fiscal year 2019, down from \$143.4 billion in 2018. (Cooke and Jiang, 2018) Much of the expected decline in total exports is attributable to soybeans and cotton. Declining sales to China are expected to affect soybeans, while the lower forecast for cotton exports is linked to slowing growth in global demand.

Under normal circumstances, one might expect macroeconomic conditions to be the central focus of an annual agricultural trade outlook like this one. But in 2019, as in 2018, international trade policy will likely affect agricultural trade more than economic conditions alone. Figure 1 shows how trade policy can matter. After tracking closely for more than a decade, the prices of soybeans in the U.S. (yellow line) and Brazil (red line) diverged sharply this spring, as China responded to U.S. tariffs with their own 25% tariff on U.S. soybeans. The price gap between Brazilian and U.S. soybeans rose to as much as U.S. \$89/metric ton in October (\$2.42 per bushel

lower U.S. prices). This meant that U.S. producers were bearing the full burden of the 25% Chinese tariff. The two price series have converged since then at a lower level, reflecting a variety of economic responses that one would expect in such a situation.

The trade policy environment in 2018 was extremely volatile. While 2019 should be somewhat calmer, it seems unlikely that all the damage done in 2018 will be undone. In circumstances like these, a review of the trade policy landscape is probably most informative for understanding the agricultural outlook for 2019.

The Administration's trade war can be described as having three fronts: 1) Canada and Mexico, 2) China, and 3) much of the rest of the world (notably the European Union). Aside from the back and forth with individual countries, another big issue for 2019 involves the President's actions to limit the effectiveness of the global system designed to defuse trade wars. We briefly review each front in the trade war, and then discuss the global dispute system and the President's actions there.



Figure 1. Soybean prices in Paranagua Brazil (red line) and Chicago (yellow line) in USD/metric ton

### Trade war front 1: Canada and Mexico

At this time last year, there was considerable uncertainty about the ongoing renegotiation of the North American Free Trade Agreement (NAFTA). Together with his Canadian and Mexican counterparts, the President signed an updated version of the agreement on December 1, 2018. The agreement, now named the “U.S. Mexico and Canada Free Trade Agreement” (USMCA), is substantively very similar to the original NAFTA agreement. What remains to be determined in 2019 is whether or not the new agreement will be ratified by the U.S. Congress. Democratic control of the U.S. House of Representatives may pose a political hurdle to passage of the agreement (Rodriguez 2018). The President has threatened to leave the NAFTA agreement if Congress refuses to ratify the USMCA. Last year we reviewed the open legal question of whether the president has the authority to withdraw without the consent of Congress (Hillberry 2017).

*Outlook:* Trade relations with Canada and Mexico appear much less likely to hurt American farmers in 2019 than they did in 2018, but the situation is not fully back to normal yet.

### Trade war front 2: China

Chinese exports were affected by a series of U.S. trade policy actions in 2018. U.S. “safeguard” tariffs on washing machines and solar panels were applied in January; Tariffs on aluminum and steel that were rationalized under the national security provisions of U.S. trade law were announced in March. These provisions affected Chinese exports, but also other countries that export the affected products. But another salvo in the trade war was aimed specifically at Chinese exports. \$50 billion of tariffs on Chinese imports were announced in June and applied in July. China responded with retaliatory tariffs of 25% on 659 items, including soybeans. Another round of tit for tat followed in September and further escalation threats were issued. The U.S. announced subsidies for U.S. soybean growers to account for some of the losses related to the Chinese tariffs (Bown and Zhang 2018). Recent negotiations between the President and the Chinese premier seem to have halted further escalation for now, but there seems to be lit-

tle progress on the removal of trade barriers that were put up this year. (Rugaber and Nicholson 2018)

*Outlook:* While further escalation seems less likely than de-escalation, prospects for a return to normalcy are quite low. U.S. soybean farmers will continue to bear a significant share of the costs of the trade war with China.



### Trade war, front 3: Rest of world

The U.S. aluminum and steel tariffs announced in March are the primary reason for ongoing disputes with countries other than China and our NAFTA partners. The European Union retaliated against the aluminum and steel tariffs by applying tariffs on a range of U.S. products. U.S. food and agricultural products facing higher tariffs were cranberries, orange juice and peanut butter (Bomey 2018)) Subsequent high profile negotiations stopped a further round of tit for tat, and generated an announcement that the European Union would buy more U.S. soybeans. But the agreement offered no substantive progress back towards the initial situation. “Simply put, the EU offered what it was already going to do. And in exchange, the U.S. agreed not to do what it hasn't done yet” Livingstone and Oroschakoff (2012). Russia, India and Turkey also imposed retaliatory tariffs in response to the U.S. Steel and Aluminum tariffs.

*Outlook:* U.S. tariffs and retaliatory tariffs remain in place with these countries, though the cycle of escalation seems to have stopped. Perhaps the most likely outcome for 2019 is that things stay where they are on this front. For agricultural producers, no change is probably the most likely outcome, and the best that

might be expected.

### **WTO reform and/or the undermining of the dispute settlement mechanism**

While the headlines have been dominated by the U.S. tariffs, the world's reaction to them, and the economic consequences of both, a potentially much more important systemic issue has been brewing at the World Trade Organization (WTO). One of the most important functions of the WTO is to referee trade disputes among its members, a process known as the dispute settlement mechanism (DSM). Until recently, the DSM had been quite successful in limiting the damage done by international disputes like those discussed earlier in the article. Motivated (they say) by a desire to reform the system, President Trump and his team are threatening to break the DSM if it is not reformed in the ways that they wish. Another possibility is that President Trump is seeking to break the DSM because the DSM is likely to find that the President's tariffs violated U.S. obligations under its WTO commitments.

The actions the president has been taking along these lines is to block the appointment of new judges to oversee appeals to the initial decisions of the DSM (Miles 2018). When the number of appellate judges becomes too small, the WTO will no longer be able to sanction retaliation against a member country that violates its commitments to follow WTO rules. It will be difficult, in those circumstances, to use the world's international trade rules to constrain U.S. actions, or those of any other country that wishes to violate its WTO commitments. This is a time of unprecedented danger for the DSM, which had been viewed as an important achievement of the international community, and with U.S. leadership of that community.

*Outlook:* The president is unlikely to waiver in his refusal to allow new judges to be seated in the DSM appellate body. A recent G20 summit passed a resolution pledging to reform the DSM, but it is unclear

how soon this will occur (or whether the President would be satisfied by the reform that did occur). The DSM will be barely functional after Sept 30, 2018. After December 2019, it cannot operate as designed without the appointment of new judges. The DSM is critical to a rules based trading system. American agricultural interests have long argued that a rules-based system is enormously important to U.S. farmers.



### **References**

- Bomey, Nathan 2018, "European Union tariffs take effect in Trump fight: How they will hit American products", June 22, USA Today, accessed at <https://www.usatoday.com/story/money/2018/06/22/european-tariffs-donald-trump/725672002/>
- Bown, Chad and Eva Zhang 2018, "First tariffs, then subsidies: Soybeans illustrate Trump's wrongfooted approach on trade," July 30, Petersen Institute for International Economics, Trade and Investment Policy Watch, accessed at <https://piie.com/blogs/trade-investment-policy-watch/first-tariffs-then-subsidies-soybeans-illustrate-trumps>
- Cooke, Bryce and Hui Jiang, 2018, "Outlook for U.S. Agricultural Trade", November 29, U.S. Department of Agriculture, accessed at <http://usda.mannlib.cornell.edu/usda/current/AES/AES-11-29-2018.pdf>
- Hillberry, Russell (2018) "NAFTA Uncertainty Looms Over U.S. Ag", December, Purdue Agricultural Economics Report, accessed at [https://ag.purdue.edu/agecon/Documents/PAER%20December%202017\\_2018%20Outlook%20Final.pdf](https://ag.purdue.edu/agecon/Documents/PAER%20December%202017_2018%20Outlook%20Final.pdf)
- Livingstone, Emmet and Kalina Oroschakoff (2018) "Trump and Juncker: The art of the no-deal", July 26, Politico, accessed at <https://www.politico.eu/article/donald-trump-jean-claude-juncker-trade-the-art-of-the-no-deal/>
- Miles, Tom (2018) "U.S. blocks WTO judge reappointment as dispute settlement crisis looms." August 27, Reuters, <https://www.reuters.com/article/us-usa-trade-wto/u-s-blocks-wto-judge-reappointment-as-dispute-settlement-crisis-looms-idUSKCN1LC190>

Rodriguez, Sabrina (2018) “Pelosi casts doubt on passage of Trump's new NAFTA without changes”, December 6, Politico, accessed at <https://www.politico.com/story/2018/12/06/pelosi-casts-doubt-on-trumps-usmca-passage-without-changes-1014361>

Rugaber, Christopher and Blake Nicholson (2018) “White House hails China trade truce as skeptics raise doubts”, December 4, Associated Press, accessed at <https://wset.com/news/nation-world/white-house-hails-china-trade-truce-as-skeptics-raise-doubts>

## AGRICULTURAL POLICY ISSUES MAKE SOME PROGRESS

**ROMAN KEENEY, PROFESSOR OF AGRICULTURAL ECONOMICS**

Headed into 2018 three policy areas stood out as critical developments with potential to significantly impact the farm economy – international trade negotiations, immigration reform policy, and replacement of the 2014 Farm Bill. The 2018 calendar year saw significant political activity on all three issues, though only the Farm Bill replacement seemed to be firmly resolved.

In our 2018 PAER Outlook article on farm policy we identified some objectives that new farm policy could pursue within the relatively tight budget constraints for farm support (p. 6). Those items focused on giving farmers flexibility to update their program participation to match changing activities of their farm. With all commodity support programs in the 2014 Farm Bill being counter-cyclical (i.e. payments increase as markets falter) it makes little sense from an income safety net perspective to lock farmers into a five-year payment program that may poorly match farm activities as annual planting adjustments take place.

As 2018 closes, all signs point to the 2018 Farm Bill passage that will provide ample opportunity for farmers to update how programs work for them during the 2019 to 2023 crop years. The key changes to commodity support policy featured in the conference report that was delivered for passage include:

- Maintaining PLC (Price Loss Coverage) and ARC (Agricultural Risk Coverage) program options with farmers given opportunity to move base acres between programs.
- Yields calculated in the ARC program are no longer required to be calculated at the county level

for the largest counties, producing a more representative measure of yield.

- PLC reference prices keep their statutory basis from the 2014 Farm Bill (e.g. \$3.70 for corn) but may be adjusted upward by as much as 15% using an Olympic average formula for the previous five years.
- Marketing loan guarantee prices are increased significantly (10 – 25%) from their 2014 Farm Bill levels.
- Removes the federal ban on hemp production.



This set of changes fit into a Farm Bill that is otherwise very similar to its immediate predecessor, including a nutrition title that is expected to continue to account for 80% of total Farm Bill spending. SNAP eligibility requirements that were prioritized in the House of Representatives version of the Farm Bill and anticipated to significantly reduce participation were largely excised from the conference report that was voted on by the full House and Senate. Efforts in the Senate to curb eligibility for farm subsidy payments were soundly rejected as the final form of the legislation offers an expansion of recipients with an interest in the farm operation. Finally, the legislation passed in the Senate and House keeps crop insurance programs

fully intact, heeding agricultural interests' 'do not disturb' demands for this component of the farm safety net.



In agricultural trade, a replacement agreement for NAFTA has been negotiated and the U.S. has increased engagements with China on de-escalating the trade war that has limited Chinese imports of U.S. soybeans and depressed U.S. prices. An appropriate question to ask is how the new Farm Bill might insulate U.S. farmers from market volatility linked to any new trade actions. Increased price support (marketing loan rates and reference prices for PLC/ARC) certainly provide stronger income protection against any international market effects that depress U.S. producer prices. The Farm Bill also increases farmer options for setting their payment parameters, allows the domestic hemp market to develop, and promotes U.S. exports to new markets through market promotion programs. These all provide a counter to potential negative impacts of the U.S. engaging in tariff protection to try and lower trade deficits.

Trade assistance payments for agriculture were enacted in 2018 but were not adopted as a formal mechanism in the Farm Bill due to the budget requirements that constrain Farm Bill spending. This means that the largest direct policy for mitigating farm income losses due to trade will continue to work on an ad hoc basis, leaving farmers uncertain on whether any assistance might be forthcoming. From agriculture's perspective, it is imperative that trade disputes with North American and Asian trade partners come to a quick resolution to guarantee the market access that has fostered U.S. agricultural ex-

ports. A new divided government with the Democratic Party controlling the House of Representatives represents a wild card in pursuing the administration's trade agenda and finalizing any trade deals.

The effect of a divided Congress may be most evident in immigration policy, with a Democratic congress able to extract some policy concessions that favor undocumented immigrants in the U.S. workforce, a significant source of U.S. agricultural labor. Immigration reform has proved elusive for better than a decade and attempts to reach a resolution have proven costly in advancing other legislation, including a failed Farm Bill vote in the middle of 2018 when agreement to vote on an immigration reform package couldn't be reached. A Democratic congress that prioritizes the economic policy concerns of immigration reform may have some success if economic growth suffers in 2019, though the beginning of a presidential election cycle would seem to indicate continued difficulties in reaching broad agreement that could ease labor shortages and uncertainties for agriculture.

In 2019, the policy fortunes of agriculture will be largely determined by accomplishments that move away from trade protection and instead increase market access for U.S. exports. This is a tenuous position for agricultural interests, as the Farm Bill is often seen as the concession made to agriculture for any negative impacts arising from an industrial focused trade policy, even though the 2018 case shows the Farm Bill has limited ability to offset any damages.



## RETAIL FOOD PRICES

**JAYSON LUSK**, DEPARTMENT HEAD & DISTINGUISHED PROFESSOR OF AGRICULTURAL ECONOMICS

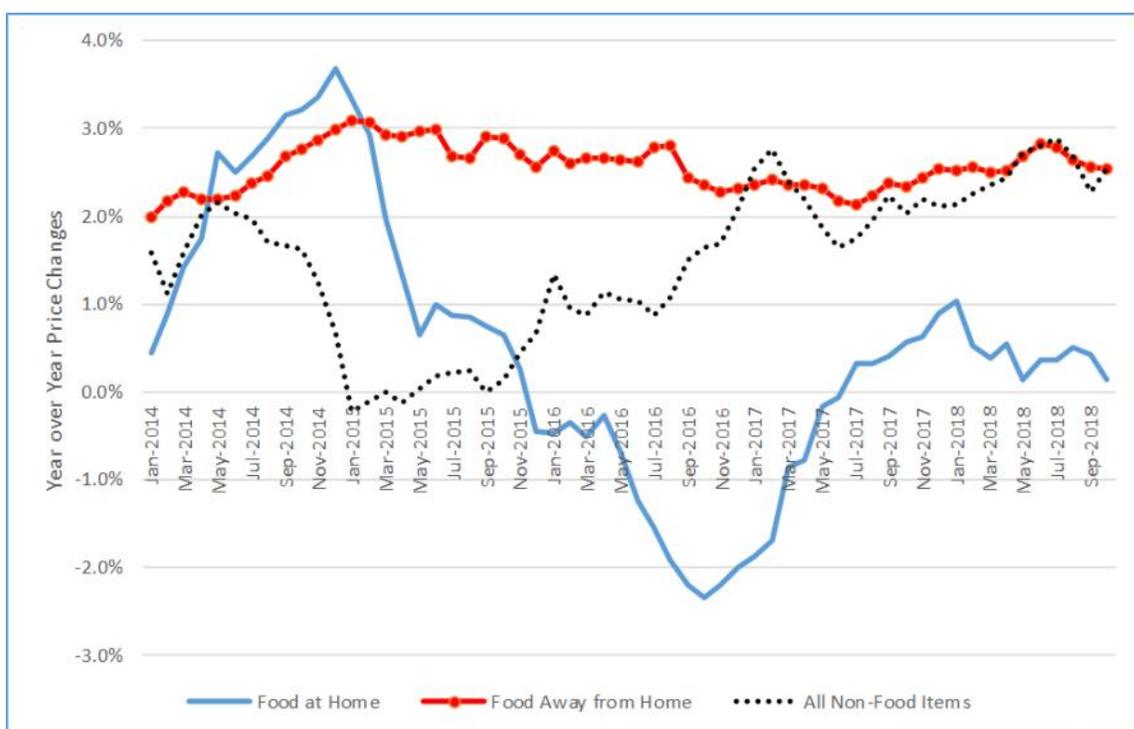
During 2018, changes in the retail price of food at home have remained low, averaging just 0.5% year-over-year growth over the past five years and 0.4% year-over-year growth thus far through 2018 according to data from the [Bureau of Labor Statistics](#). Inflation of food prices away from home, by contrast is higher, but has remained fairly stable over time at about 2.6% year-over-year increases. Since 2016, prices of food at home have grown much more slowly than overall prices in the economy, implying food at home is becoming cheaper in real terms. Since 2017, changes in prices of food away from home have been at about the same level as price changes in the rest of the economy.

The U.S. Department of Agriculture, Economic Research Service (ERS) [projects](#) annual food price inflation, for combined food at home and away from home, of between 0.75% and 1.75% for the year 2018, increasing to 1.5% to 2.5% for 2019. In 2018, low agricultural commodity prices helped keep downward pressure on food price inflation. Several

commodities, such as pork, dairy, and processed fruits and vegetables experienced overall price declines, or deflation, over 2018. A few commodities have experienced more significant retail price increases over 2018, including beef (expected to increase about 1.75%) and eggs (expected to increase more than 9% from 2017 to 2018).

As the foregoing suggests, food price affordability is driven in part by where consumers choose to buy their food. ERS [calculations](#) indicate that since 2010, consumers have been spending more money on food away from home than they are on food for at-home consumption. In 2017, consumers spent almost \$870 billion on food away from home and about \$747 on food at home, implying 54% of food expenditures were for food consumed away from home.

Even for food consumed at home, consumers are changing their purchasing habits. Two decades ago, 71% of food for at-home consumption was bought at grocery stores; today the figure is only 58%. Consum-



ers have shifted food purchases away from grocery stores toward warehouses clubs and superstores. For food away from home, there has been a slight shift toward more food spending at limited-service restau-

rants over the past two decades, but overall the share of meal spending at full service restaurants compared to other outlets has remained steady at about 36% of all food away from home spending.

## IT'S ALL LOWER: COW NUMBERS, TOTAL MILK PRODUCTION, FORECASTED DOMESTIC USE AND MILK PRICES TOO

**COURTNEY BIR, PH.D. CANDIDATE AND RESEARCH ASSOCIATE**

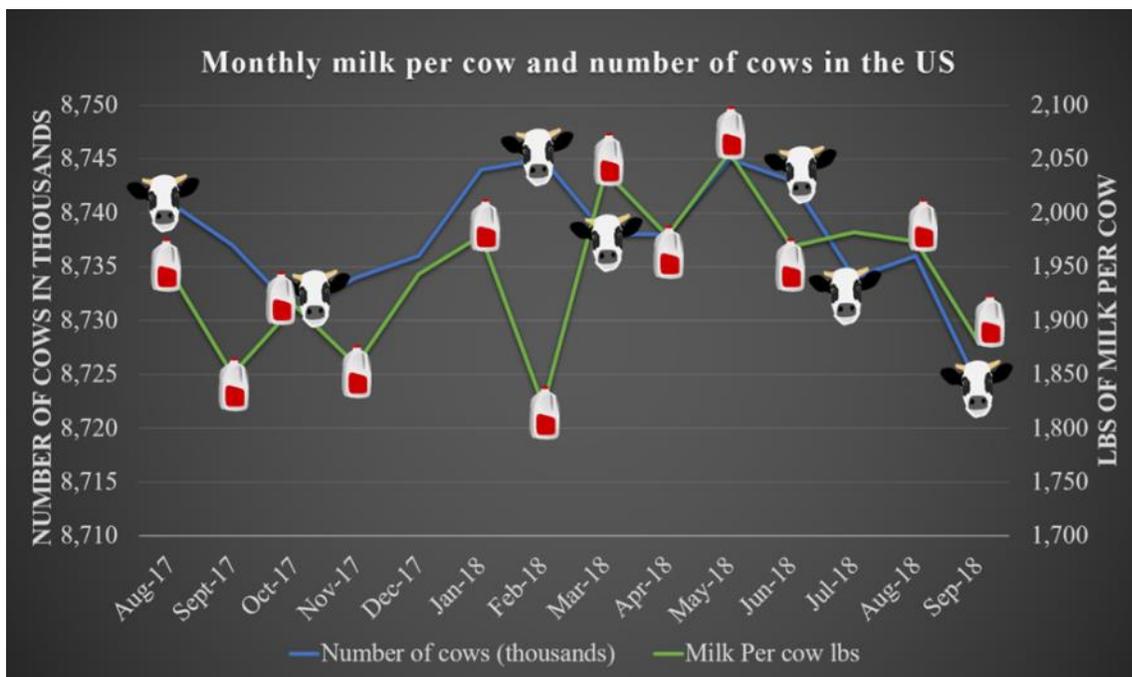
**NICOLE OLYNK WIDMAR, PROFESSOR OF AGRICULTURAL ECONOMICS**

Milk price trends make reaching break-even look bleak for many farms. Recent news media related to dairy farming in the U.S. has been difficult to even see or hear, let alone to actually live though on the farm. Untimely and delayed harvests in many parts of the U.S. make predicting feed costs difficult, in addition to the lingering questions about quality. As of now, the verdict is still out on the quality of the new crop in many parts of the country. While not the focus here, continued developments with respect to grain trade, tariffs, and the Farm Bill also infuse uncertainty into grain markets. Grain markets necessarily impact livestock markets through feed prices, although the added stress of feed price uncertainty in a particularly tight margin situation for dairy farmers today seems to be ratcheting up concerns to

(seemingly endless) market news. Prior to harvesting difficulties, feed prices had been down. The cost of hay is not necessarily a bright spot for U.S. dairy farmers in 2019. The price of Alfalfa hay in August of this year was \$177 per short ton, up \$30 dollars from August of last year (USDA, 2018). However, forage markets are notoriously localized. So, changes of the national average in hay prices can be interpreted on the aggregate as pointing towards higher

forage costs, but individual locales may face different price scenarios.

Although the dairy cow herd size is decreasing, improvements in lbs of milk-per-cow is offsetting any potential decrease in milk production. Increased culling, while effectively reducing cows in production, should yield improvements in efficiency and improve overall milk production on a per-cow basis, as low-producers are eliminated from herds. As of September 2018 the dairy herd has decreased to 8.7 million, down from the record high of 9.4 million last year (USDA, 2018). However, production is up approximately 30 pounds per cow compared to September 2017 to 1,880 pounds (USDA,



A look at the changing number of cows in the U.S. cowherd and pounds of milk produced per cow on a monthly basis. Data source: United States Department of Agriculture Economic Research Service, Dairy Data 2018. Graphic developed by Courtney Bir, 2018.

2018). The predicted total milk production for 2018 is 217 billion lbs (LMIC, 2018).

Consumption of last year's (dairy products) shining stars, butter and cheese, is remaining steady (USDA). The price of Grade AA butter on the Chicago Mercantile exchange has averaged \$2.25 a pound as of September this year. On the Chicago Mercantile exchange 40 lb blocks of cheddar cheese have averaged \$1.58 a pound as of September this year while 40 lb barrels have averaged \$1.44 (USDA). Both butter and cheese prices have weakened compared to last year. Oceania export prices for butter have been trending downward, with a

28% decrease in price this October compared to October of 2017. Nonfat dry milk Oceania export prices have fared slightly better, trending upward with an 8% increase in price this October compared to October 2017.

The all-milk price remains low. The USDA last forecasted lowered Class III prices at \$15.15-\$16.05 per cwt and unchanged Class IV at \$14.35-\$15.35 per cwt. The results of the lowered Class III was an all-milk price for 2019 that was lowered 15 cents at the midpoint from the previous estimate, set in the November outlook at \$16.70-\$17.60 per cwt.

## PORK INDUSTRY LOOKING FOR A BETTER 2019

**CHRIS HURT**, PROFESSOR OF AGRICULTURAL ECONOMICS

The year of 2018 did not turn out so well for pork producers as estimated losses were about \$12 per head for farrow-to-finish operations. These were the largest losses since 2012 when high feed prices prevented positive returns. Pork production was up 3% in 2018. That was record high production as the industry has been in expansion since 2014.

Trade conflicts directly affected the U.S. pork industry in 2018. The two most important countries that put tariffs on U.S. pork were Mexico and China. Exports to Mexico in 2017 totaled 7% of U.S. production and exports to China represented 2% of U.S. production, or 9% combined. Markets reacted negatively to the fears of lost pork exports resulting in low hog prices in the late-spring and summer. Live prices in the third quarter of 2018 were \$44 compared to near \$56 for the same quarter in 2017. This reduction in price was far more than could be explained by higher supplies alone.

The Trump administration did provide trade assistance to pork producers as Market Facilitation Payments through USDA FSA offices. The payment was \$8 per head of inventory on August 1, 2018. This is roughly equivalent to about \$2 per head on annual production and there were payment limits that restricted larger producers. So, the trade assis-

tance helped smaller producers, but was not sufficient to cover the estimated \$12 per head of losses in 2018.

Now, at the end of 2018, we observe that the damage to exports was not as severe as feared. Pork export volume to China is down 19% for this calendar year and most of the decrease has been since the summer when Chinese tariffs on U.S. pork were put in place. While sales to Mexico also decreased relative to the same months a year-ago once tariffs were in place, total 2018 year-to-date sales to Mexico are still up 1%. Thus, Mexico largely did not reduce purchases as much as feared. There are at least two reasons. First Mexico wanted to avoid conflicts with the U.S. and quickly realized that the big trade battle was between the U.S. and China. Secondly, the U.S. probably remained near the lowest costs source of pork, even with the tariffs in place because of the close location and favorable transportation costs.

Turning to 2019, prospects look somewhat better. Producers are expected to continue to provide record supplies with another increase of 3%. Market inventories in the September *Hogs and Pigs* report were about 3% higher and represent the hogs to be marketed this winter. Farrowing intentions were also up about 2% and with higher pigs per litter will provide about 3% higher hog numbers next spring and summer. The supply of hogs in the fall of 2019 will come from the spring

2019 farrowings and those may only be up 1% given the losses in 2018.

Demand continues to look favorable for 2019 with a continuation of U.S. and World economic growth, but at a slowing growth rate. Low unemployment in the U.S. and rising wage rates will be supportive to domestic meat demand.

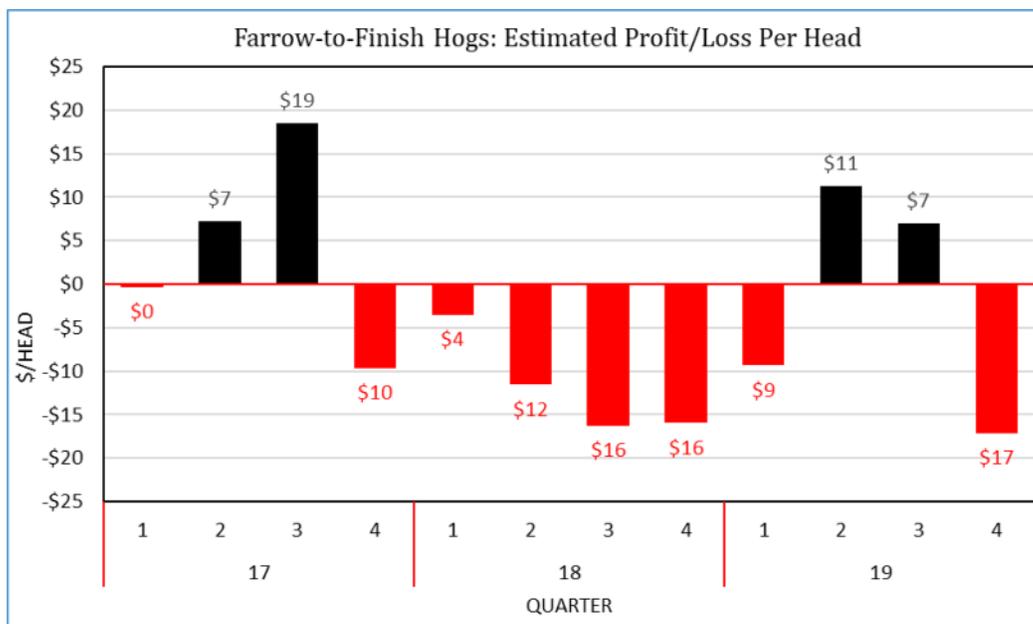
Global demand for 2019 has turned more optimistic for multiple reasons. First, total pork exports to all destinations in 2018 will be up 6%. While China did buy less in 2018, this was more than made up by other countries buying more. USDA analyst estimate that U.S. pork exports will grow again by a strong 8% in 2019. Second, the signing of the USMCA calms trade conflicts with Mexico and Canada. That trade agreement still needs approval in each country. In addition, it leaves in place the U.S. tariffs on steel and aluminum. It was these tariffs that caused Mexico and Canada to place restrictions on U.S. pork. Those tariffs still need to come off. Third, there appears to be progress toward cooling of the trade conflicts with China. If there is a grand bargain for China to buy more U.S. goods then pork will be one of those named Ag goods. Fourth, African swine fever in China is not under control and China may import more pork and other meat products to compensate for lost hogs due to the disease. China produces 97% of the pork they consume and imports only 3%. So, a loss of just 1% of their hogs due the disease could

result in one-third more pork imports.

What are hog price prospects for 51% to 52% lean carcasses on a live weight basis? Hog prices in 2018 averaged about \$46. Current prospects are for prices to average near \$50 in 2019. Winter prices are expected to be in the mid-\$40s and then move to the mid-\$50s for averages in the second and third quarters. Then prices will likely drop seasonally back toward the mid-\$40s in the final quarter of the year.

Feed prices have been low and fairly steady in recent years. This has helped to stabilize costs of pork production around my estimated total costs of \$50 per live hundredweight. For 2019, corn prices are expected to be about 20 cents per bushel higher while soybean meal may be around \$20 per ton lower. Pork producers can expect slightly higher total costs of production due to higher corn prices and higher labor, interest, and building costs. With current prospects for hog prices to average near \$50, this means 2019 would be a year near breakeven for farrow-to-finish producers. Losses would be the norm in the first and the fourth quarter with profits in the second and third quarter roughly offsetting.

The bottom line is that the U.S. industry will be producing record pork supplies in 2019 and will need more open export markets and strong demand support. If not, another year of losses might result.



# CORN PRICES HAVE BULLISH POTENTIAL

**CHRIS HURT**, PROFESSOR OF AGRICULTURAL ECONOMICS

Surprise! Corn prices are expected to be at their highest level in three years. The potential strength in prices is being led by record usage and declining inventories.

Supplies are high, but usage is higher. U.S. yields reached record levels at 178.9 bushels per acre. The 2018 crop at 14.6 billion bushels was the second largest ever. The good news for growers is that usage is expected to exceed 15 billion bushels. As a result of usage exceeding production, ending stocks of corn will decrease by over 300 million bushels.

The major categories of usage will be at-or-above records. That starts with exports where USDA expects a 1% increase over last year's crop to 2.45 billion bushels. So far this marketing year, which began in September, export commitments (loadings plus unshipped sales) are off to an outstanding start which is up 16% from last year at this time. Weekly export sales are reported by USDA, so the market will watch the trend on exports closely this winter.

Corn use for feed is expected to reach 5.5 billion bushels the largest since the 2007 crop. This will be the largest feed use in the ethanol era. As the use of corn for ethanol grew over the past decade, the feeding of ddgs increased and tended to reduce the volume of corn fed directly to animals.

Finally, corn use for ethanol is expected to be nearly the same as last year's record near 5.6 billion bushels. So far this marketing year, corn use for ethanol is up by 1%. However, ethanol plant margins have been running in the negative with low energy prices (oil and gasoline). These weak margins likely mean there will be some plant slowdowns or closings in coming months and that corn use for ethanol may be somewhat lower for the 2018 crop.

Corn ending stocks are lower for both the 2017 crop and now the 2018 crop. The stocks-to-use ratio has dropped from 15.7% for the 2016 crop to 11.8% currently anticipated for this year (chart). This is a meaningful tightening of inventory and provides bullish price opportunities if usage is stronger than currently anticipated, or if weather in South America or the U.S. turns adverse in 2019.

Higher prices are expected! U.S. marketing year average (MYA) prices were \$3.36 per bushel for both the 2016 and 2017 crops. Current estimates are for the 2018 crop to be \$3.60, a 7% increase. Indiana corn prices have averaged about 15 cents higher than the U.S. so an expected Indiana price for the 2018 crop would be \$3.75.



In Indiana, record yields and stronger prices will contribute to an important income boost relative to the 2017 crop. Yields in the state at 194 were 14 bushels higher than 2017 and corn prices are expected to be about 20 cents higher. Revenue per acre will rise by \$88 per acre over 2017. Assuming costs were \$10 per acre higher, this leaves an estimated net return that is \$78 per acre higher than 2017. Over the states 5.2 million harvested acres, corn returns potentially add an estimated \$400 million to farm income compared to 2017. These higher corn returns will be split between 2018 and 2019 as Indiana farmers will sell about 40% of the 2018 crop in calendar year 2018 and the remain-

ing 60% in 2019.

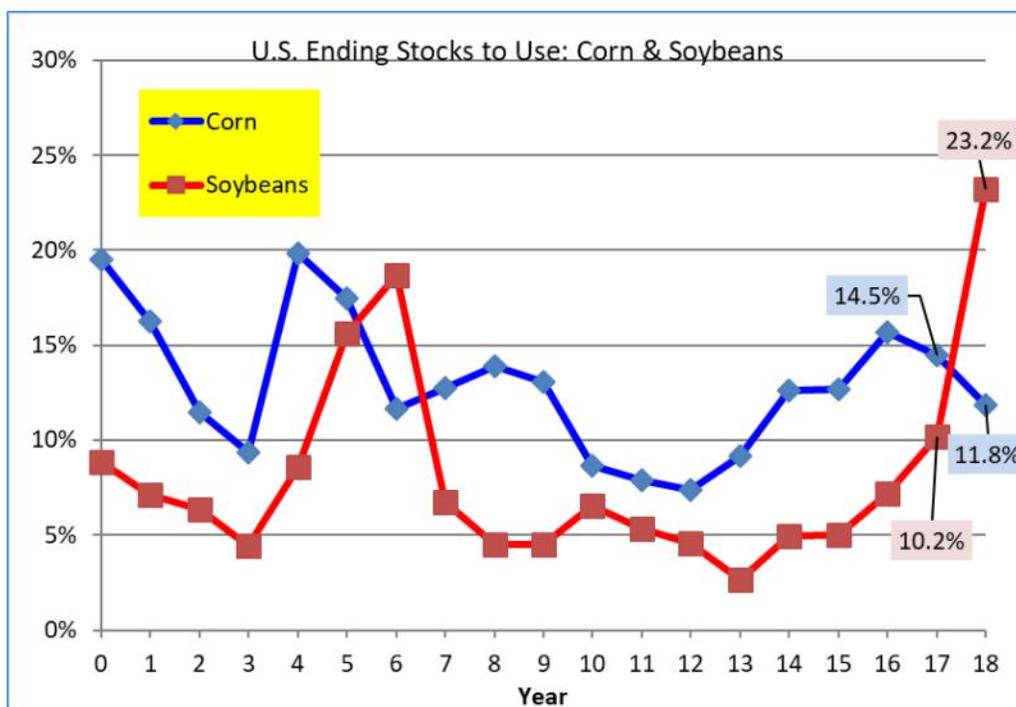
Storage continues to be an important strategy. Current cash bids tend to have good premiums for later delivery. Bids for June/July 2019 delivery tend to be 15 to 25 cent premium to nearby bids (depends on location). Those with on-farm storage consider forgone interest returns as their primary storage costs. Depending on each individual’s interest rate, this amounts to 1.0 to 1.5 cents per bushel per month, or 5 to 8 cents for storage into the early summer. If one can gain 20 cent higher prices for 5 to 8 cents of cost, that is a handsome additional return to storage. The point is that pricing and delivery can occur at two different times. When you get ready to price, also consider the returns for pricing for later delivery.

Those using commercial storage will probably find that the monthly storage charge along with forgone interest costs is higher than the premium bids for later delivery. For example assume the 5 to 8 cents of forgone interest costs to store into the early summer, and also add 3 cents per month of storage costs for commercial storage. Five months of storage adds an additional 15 cents added to 5 to 8 cents for total costs of 20 to 23 cents. These costs often exceed the premium bids for later delivery.

Short term upside targets are \$3.90 to \$4.00 on the March futures and \$4.10 on July futures. The next objectives above these would be \$4.20 to \$4.30. These are levels that will provide around \$4.00 or higher cash bids at processors and ethanol plants.

Corn acreage will increase in 2019, but maybe not by as much as the early estimates. Price relationships for new-crop 2019 can still change based on what happens to the U.S./China trade dispute and to the final corn and soybean yields in South America. In addition Purdue budgets for 2019 using current new-crop prices are still suggesting that soybeans are favored over corn in the Eastern Corn Belt. Market developments (China/South America, etc.) will cause new crop prices to “bid” for the acres that are needed. The trade conflicts with China and the current easing of those tensions makes it difficult to predict how new-crop price relationships will unfold this winter. For this reason, it is suggested that farmers try to maintain some flexibility on some of their 2019 acres. This may also imply not forward buying all inputs such as seed.

Keep an eye on new crop pricing opportunities with the potential for December 2019 futures to reach \$4.25.



## SOYBEAN PRICES DEPEND ON CHINA

**CHRIS HURT, PROFESSOR OF AGRICULTURAL ECONOMICS**

With a record amount of soybeans to sell from the 2018 crop it is a bad year to jeopardize our largest buyer. The U.S. had record soybean yields and record total production in 2018 and also lost the opportunity to sell to China, our largest customer during their peak buying season.

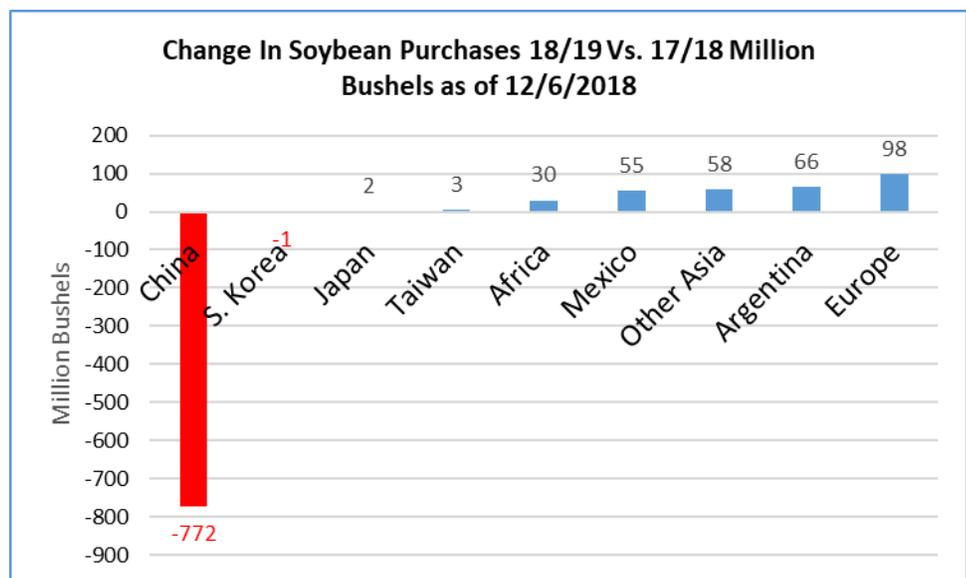
China's biggest purchases of soybeans from U.S. farmers are in October-November-December. The biggest purchases tend to come in October (our peak harvest month). In the previous two harvest of 2016 and 2017 we sold China about 250 to 300 million bushels each year in October. This year we sold them merely 10 million bushels in October.

The 25% tariff on U.S. soybeans going to China largely made U.S. origin beans uncompetitive in China in the last-half of 2018. These tariffs caused a reshuffling of soybean flows across the globe adding additional transportation costs and creating logistic issues.

What are the impacts of the Chinese soybean tariff on U.S. soybeans sales so far this marketing year which started in September? Total sales are down 467 million bushels from the same period for the previous marketing year. Soybean sales are currently down 1/3 this marketing year versus last.

Chinese purchases of U.S. beans this year (through December 6, 2018) are down 98% as they have made good (so far) on their threat to avoid buying U.S. origin. The reduction in Chinese purchases is 772 million fewer bushels, which has not been offset by 305 million bushels of greater purchases by the rest of the world. The chart shows the enormous decrease

in Chinese purchases as well as several regions buying more beans including Europe, Argentina, Mexico and Africa. Argentina sold many of their soybeans to China and then purchased cheaper U.S. origin beans for their own crushing plants. U.S. soybean prices at the Gulf of Mexico dropped to as much as \$2.50 a bushel under Brazilian port prices at times this past fall. The rest of the world has purchased more U.S. beans largely because U.S. beans were lower priced this past fall than South American sources. Brazil as an example sold their beans to China and this gave an opportunity for the U.S. to sell more beans to Europe, but at low prices.



There is a lot of uncertainty on how many bushels of soybeans the U.S. will export from the 2018 crop. Of course how the trade conflict with China evolves is the primary source of that uncertainty. The U.S. has already missed the prime shipping months for the Chinese market. China still needs some of our 2018 beans but it is unclear how many and when those will be shipped. This could mean it will be our 2019 crop before tariff distortions can work their way through the global markets. If so, it is likely that large inventories of U.S. beans and low prices could

extend to the 2019 crop.

There is a bullish possibility however. That would be a negotiated settlement with China in which they agree to buying larger amounts of U.S. Ag goods. China has already said they are willing to increase the amount of U.S. goods they purchase and Ag goods are one of the categories they have listed. In 2017 we sold them about \$26 billion of Ag and food products. If a negotiated settlement increased that by \$10 billion, that would represent about a 40% increase. New purchases of U.S. Ag goods in that magnitude would be bullish for a host of commodities, but soybeans and animal protein would likely be favored.

Soybean exports were moved downward to 1.9 billion bushel for the 2018 crop by USDA analyst. That is a decline of 11% from last year. Keep in mind that no one knows how export numbers will evolve (China). While USDA is using an 11% reduction actual sales so far are down 33% and thus pointing to a much lower export total, at least at this writing.

The contrast between the fundamentals for corn and soybeans could not be more stark. Corn inventories are coming down as usage is greater than production for the second year. On the other hand, soybean inventories are likely to be at burdensome levels (see chart in corn section).

On December 1, the U.S. and China agreed to have a cooling period of 90 days to freeze threats of additional tariffs, open some trading opportunities, and to start to develop a framework to resolve the trade issues. On December 13, 2018 the first announcement of Chinese purchases of 2018 crop U.S. soybeans was made.

The marketing year average price (MYA) for the 2017 crop was \$9.33 per bushel. With the potential for burdensome inventories, USDA lowered their 2018 crop estimate to \$8.60. It is important to recognize that if inventories are this large, then prices certainly could be lower.

Soybean prices rallied on the prospects of opening

some soybean trade with China and on the possibilities of a longer term road map to settle trade disputes. March futures in the \$9.20 to \$9.40 range have been targets for beans that need to be sold in the short run. Most will want to hold some inventory for the possibility of a favorable negotiated settlement with China and/or for some harmful growing weather in South America in the next few months. These possibilities could result in March 2018 futures testing \$10.

Like corn, soybean bids show premiums for delivery into the summer. These are 35 to 50 cents for summer delivery compared to current delivery and depends on location. Foregone interest costs to store until early summer might be 15 to 18 cents. So, those with on-farm storage can generate favorable returns from selling for early summer if premiums are 35 to 50 cents.

Unlike most years, early summer premiums may be high enough to cover foregone interest costs and commercial storage charges. This is unusual but encourages those with beans in commercial storage to examine their potential added revenues and added costs of selling for early summer delivery.

New crop pricing might be considered if November 2019 futures reach or exceed \$10.

Like corn, Indiana returns for 2018 soybeans will be much higher (on average) than from the 2017 crop. Record yields at 60 bushels per acre were 6 bushels higher than 2017. While prices are expected to be down 73 cents (U.S. \$9.33 dropping to \$8.60), the market facilitation payment for trade assistance on the first-half of production was the equivalent of \$.825 on each bushel produced. So prices from the market plus trade assistance were \$9.425. This is higher than the \$9.33 price for 2017. Indiana soybean estimated revenues from the 2018 crop are up \$59 per acre from the 2017 crop and if \$8 per acre is taken off to account for higher costs, then returns are about \$50 per acre



higher. On 5.9 million harvested acres, this is around \$300 million more estimated income than the 2017 soybean crop.

On December 17, 2018, USDA announced trade as-

sistance for the second-half of production. Additional soybean payments of \$.825 per bushel will result in nearly \$50 per Indiana acre on average. This adds another \$300 million of income to the 2018 Indiana soybean crop.

## 2019 PURDUE CROP COST & RETURN GUIDE

**MICHAEL LANGEMEIER**, PROFESSOR OF AGRICULTURAL ECONOMICS

**CRAIG DOBBINS**, PROFESSOR OF AGRICULTURAL ECONOMICS

The 2019 Purdue Crop Cost and Return Guide, which is available for free download from the Center for Commercial Agriculture website ([here](#)), gives estimated costs for planting, growing, and harvesting a variety of crops, as well as estimated contribution margins (revenues minus variable costs) and earnings (revenues minus total costs). Total costs include accounting and opportunity costs. Examples of opportunity costs are the interest charge on the investment in machinery, buildings, and land, and depreciation on machinery and buildings. 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 early December 2018.

The guide presents cost and return information for low, average, and high productivity soils. The discussion in this paper 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. 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. It is important to note that crop yields have been modified in this year's guide. The current yield estimates reflect trend yields for Indiana for each crop. The contribution margin, obtained by subtracting total variable cost from market revenue, ranges from \$170 per acre

**Table 1. 2019 Purdue Crop Budget for Average Productivity Soil.**

|                             | Continuous<br>Corn | Rotation<br>Corn | Rotation<br>Soybeans | Wheat  | Double-Crop<br>Soybeans |
|-----------------------------|--------------------|------------------|----------------------|--------|-------------------------|
| Expected Yield per Acre     | 164                | 174              | 54                   | 77     | 38                      |
| Harvest Price               | \$3.80             | \$3.80           | \$9.20               | \$5.00 | \$9.20                  |
| Market Revenue              | \$623              | \$661            | \$497                | \$385  | \$350                   |
| Less Variable Costs         |                    |                  |                      |        |                         |
| Fertilizer                  | 137                | 126              | 51                   | 81     | 38                      |
| Seed                        | 111                | 111              | 67                   | 44     | 78                      |
| Pesticides                  | 58                 | 58               | 50                   | 30     | 45                      |
| Dryer Fuel                  | 39                 | 31               | 0                    | 0      | 5                       |
| Machinery Fuel              | 20                 | 20               | 12                   | 12     | 9                       |
| Machinery Repairs           | 22                 | 22               | 18                   | 18     | 15                      |
| Hauling                     | 16                 | 17               | 5                    | 8      | 4                       |
| Interest                    | 12                 | 12               | 7                    | 6      | 7                       |
| Insurance and Miscellaneous | 38                 | 38               | 34                   | 9      | 9                       |
| Total Variable Costs        | \$453              | \$435            | \$244                | \$208  | \$210                   |
| Contribution Margin         | \$170              | \$226            | \$253                | \$177  | \$140                   |

See ID-166-W for more detail, December 2018 Estimates.

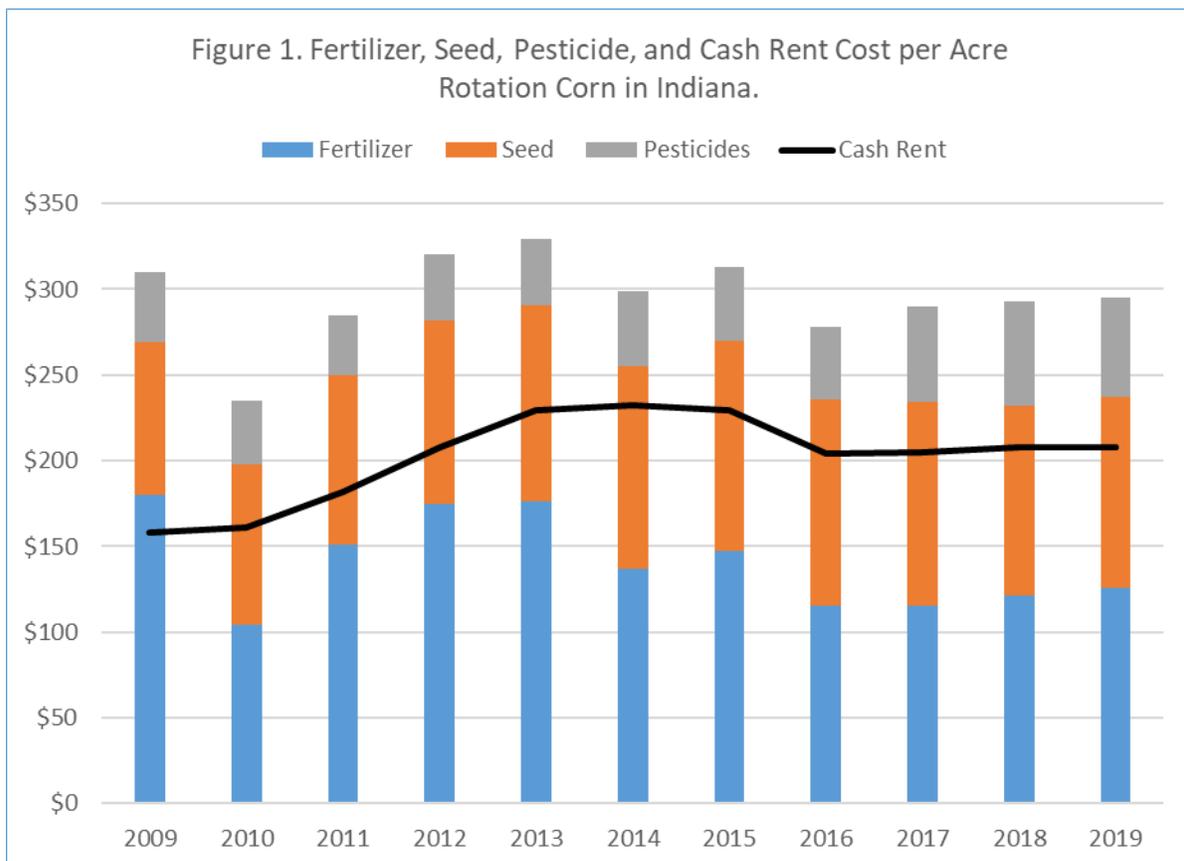
for continuous corn to \$317 per acre for wheat/double-crop soybeans. The contribution margins for rotation corn and rotation soybeans on average productivity soil are \$226 and \$253 per acre, respectively. It is important to note that the contribution margin is used to cover overhead costs such as machinery costs, family and hired labor, and rent. Failure to adequately cover these overhead costs typically puts downward pressure on cash rent.

From 2007 to 2013, the average contribution margin for rotation corn was higher than the contribution margin for rotation soybeans by \$38 per acre. The situation since 2014 has been considerably different. The average difference in the contribution margin since 2014 has been an advantage to soybeans of \$72 per acre. However, with the decline in soybean prices, the projected difference in 2019 is only \$27 per acre.

Figure 1 illustrates the trends in fertilizer, seed, pesticide, and cash rent costs for rotation corn on average productivity soil from 2009 to 2019. Fertilizer cost peaked in 2013 at \$176 per acre (\$1.08 per bushel). In 2019, fertilizer cost per acre is projected

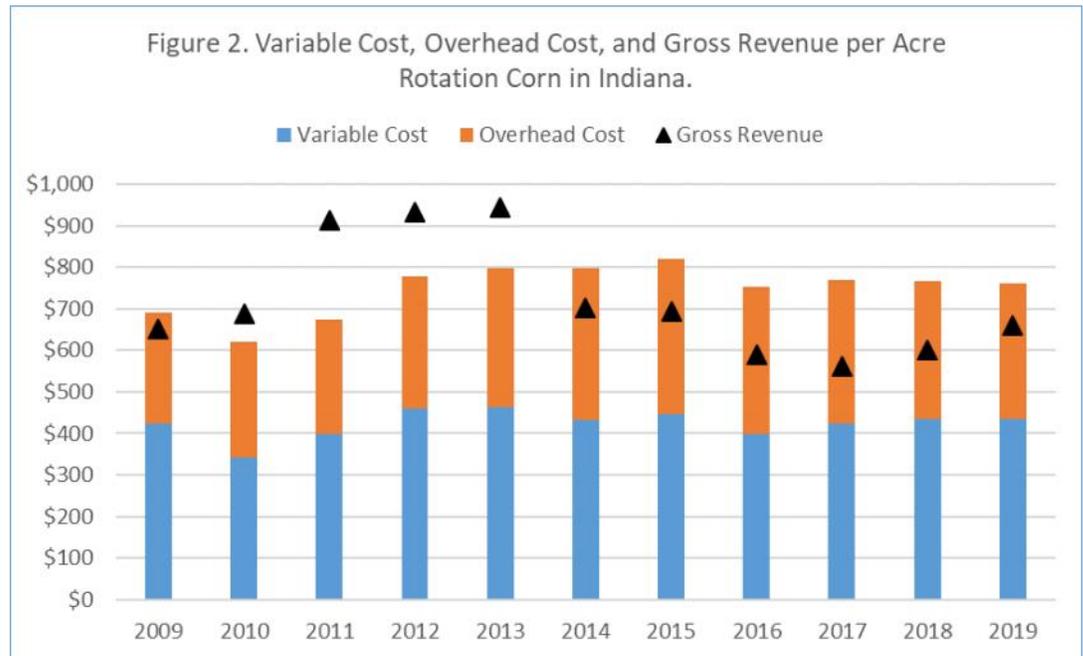
to be \$126 per acre (\$0.72 per bushel). Cash rent per acre peaked in 2014 at \$232 per acre (\$1.42 per bushel). At \$208 per acre (\$1.20 per bushel), projected cash rent is \$24 per acre (\$0.22 per bushel) lower than it was at the peak in 2014. Partially due to resistant weed problems, pesticide cost per acre in 2019 is expected to be higher than its level in 2013 and 2014, the peak cost years for fertilizer cost and cash rent.

Gross revenue (market revenue plus government payments), variable cost, and overhead cost per acre for rotation corn on average productivity soil is illustrated in figure 2. Variable cost per acre peaked in 2013 at \$462 per acre (\$2.83 per bushel), and is projected to be \$435 per acre (\$2.50 per bushel) in 2019. Fixed cost (overhead cost) per acre peaked in 2015 at \$375, and is projected to be \$330 per acre in 2019. The breakeven price needed to cover variable and fixed costs varied from \$4.77 to \$4.98 per bushel from 2012 to 2015. In 2016 and 2017, the breakeven price declined to approximately \$4.55 per bushel. In 2018, the breakeven price dropped to \$4.45 per bushel. The projected breakeven price for 2019 is \$4.40 per bushel. Gross revenue for rotation corn has declined from \$945 per acre in 2013 to \$661 per acre in 2019. The



expected earnings per acre for rotation corn in 2019 is a loss of \$104 per acre.

Figure 3 illustrates the trends in fertilizer, seed, pesticide, and cash rent costs for rotation soybeans from 2009 to 2019. Fertilizer cost and cash rent have declined since their peaks in 2013 and 2014. Resistant weed problems have put upward pressure on pesticide cost for rotation soybeans.



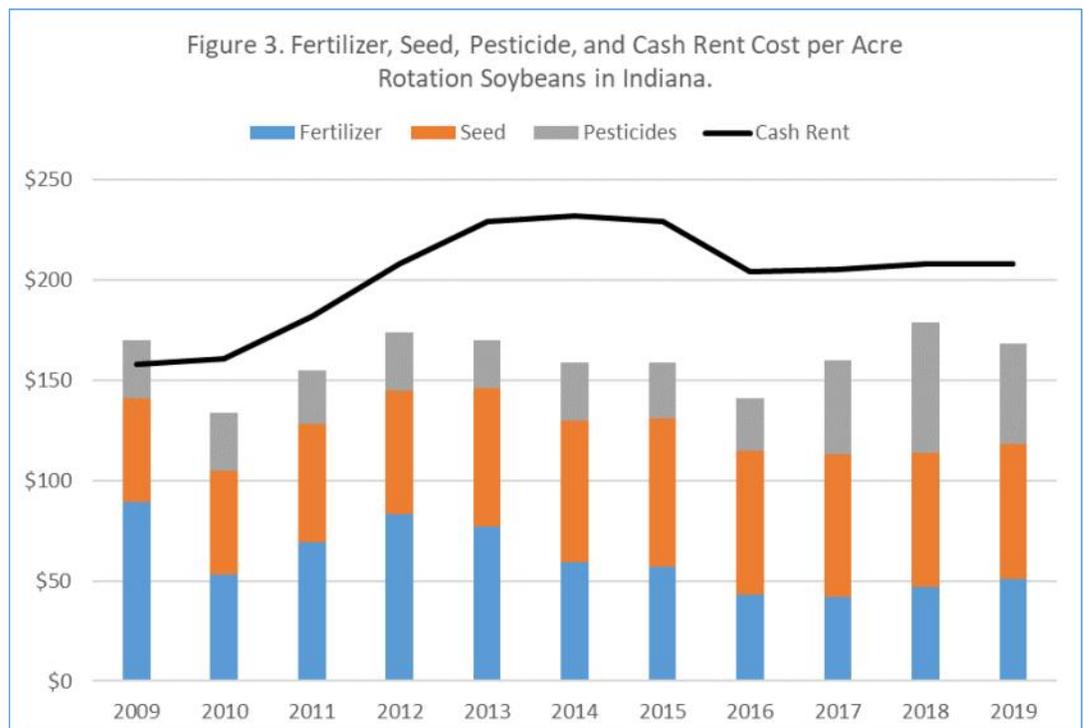
Gross revenue (market revenue plus government payments), variable cost, and overhead cost per acre for rotation soybeans on average productivity land is illustrated in figure 4. Primarily due to higher herbicide cost, variable cost per acre in 2019 is projected to be \$244 (\$4.52 per bushel), which is higher than the variable cost per acre in 2013 (\$239 or \$4.43 per bushel). Like corn, fixed cost per acre peaked in 2015 at \$375, and is projected to be \$330 per acre in 2019. The breakeven price needed to cover variable and fixed costs declined from \$11.94 per bushel in 2015 to \$10.63 in 2019.

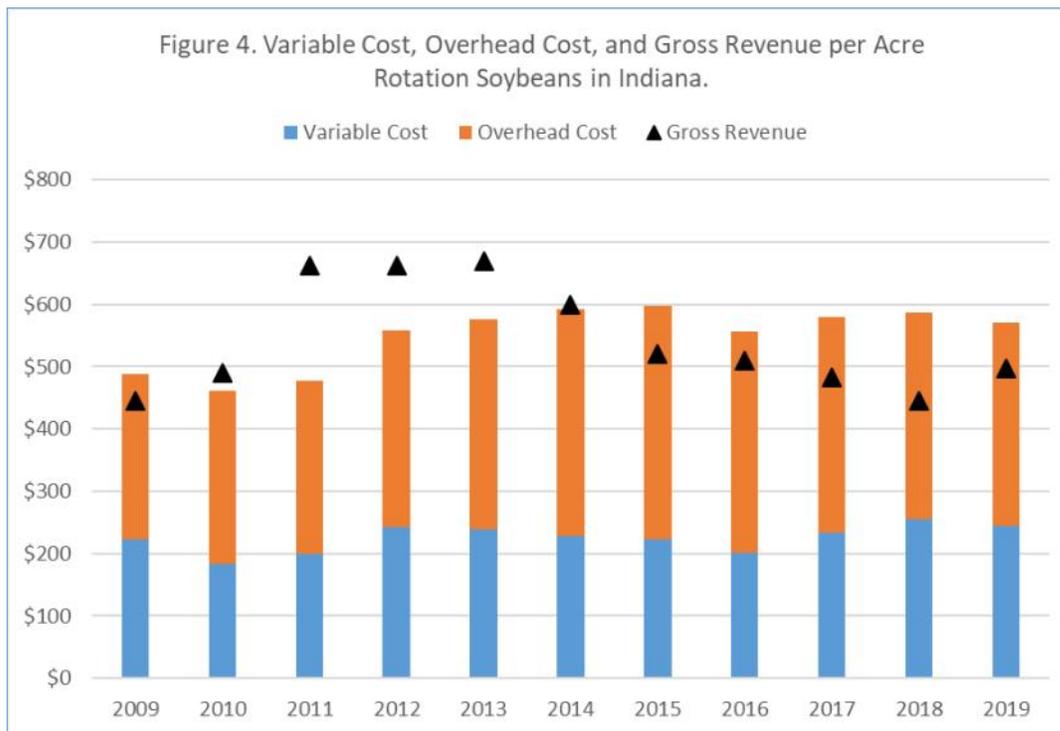
Gross revenue for rotation soybeans has declined from \$670 per acre in 2013 to \$497 per acre in 2019. The expected 2019 earnings for rotation soybeans is a loss of \$77 per acre.

The breakeven prices for rotation corn and rotation soybeans discussed above were for average productivity land. For high productivity land, the breakeven prices for rotation corn and rotation soy-

beans are expected to be \$4.03 and \$9.86 per bushel, respectively. The breakeven prices for low productivity land are expected to be \$4.88 and \$12.02 per bushel for corn and soybeans, respectively. Thus, unless prices rise above \$4.03 per bushel for corn and \$9.86 per bushel for soybeans, earnings per acre will be negative for low, average, and high productivity levels.

In summary, margins will remain tight in 2019. Budgeted earnings per acre have been negative for corn since 2014 and for soybeans since 2015. Though





smaller in 2019, the projected difference in margins between rotation corn and rotation soybeans still favors soybeans. The difference is small enough this year that this relationship could easily switch between now and next spring.

Tight margins increase 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 impact a farm's liquidity position and financial performance.

## CASH RENTS AND FARMLAND VALUES REMAIN UNDER DOWNWARD PRESSURE

**CRAIG DOBBINS**, PROFESSOR OF AGRICULTURAL ECONOMICS

### Cash Rent

Last year at this time, many forecasters indicated the worst of the margin pressure appeared to be behind production agriculture. Farmers had achieved some success in lowering per unit cost of production. In addition, supply and demand balance appeared to be improving. Unfortunately the hoped for improvements did not materialize when a trade war with China broke out in June 2018. The opinions quickly turned negative as tight margins became even tighter.

Comparing annual per bushel production costs from the Purdue Crop Cost and Return Guide indicates some progress has been made in lowering per unit costs. In 2013, per unit variable costs for rotation corn was \$2.83 per bushel on average farmland. In 2016, this cost was \$2.43 (Table 1), a decline of 16%. From 2016 to 2018, per unit cost has been relatively stable. An increase in the per unit production cost for rotation corn is expected for 2019, increasing from \$2.39 to \$2.50.

The change in per unit production cost for rotation

Table 1.

Estimated per bushel costs and earnings for a 3,000-acre corn and soybean farm - 2016, 2017, 2018, & 2019

|                                     | 2016    |         | 2017    |         | 2018    |         | 2019   |        |
|-------------------------------------|---------|---------|---------|---------|---------|---------|--------|--------|
|                                     | Corn    | Beans   | Corn    | Beans   | Corn    | Beans   | Corn   | Beans  |
| Yield (bu.)                         | 165     | 50      | 170     | 52      | 172     | 53      | 174    | 54     |
| Price per bu.                       | \$3.50  | \$8.40  | \$3.60  | \$9.50  | \$3.60  | \$9.70  | \$3.70 | \$8.80 |
| Variable Cost per bu.               | \$2.43  | \$4.12  | \$2.44  | \$4.48  | \$2.39  | \$4.72  | \$2.50 | \$4.52 |
| Contribution Margin per bu.         | \$1.07  | \$4.28  | \$1.16  | \$5.02  | \$1.21  | \$4.98  | \$1.20 | \$4.28 |
| Operator Labor & Machinery Overhead | \$0.86  | \$2.84  | \$0.82  | \$2.67  | \$0.80  | \$2.58  | \$0.70 | \$2.26 |
| Cash Rent                           | 1.24    | 4.08    | 1.21    | 3.94    | 1.22    | 3.96    |        |        |
| Crop Earnings                       | -\$1.03 | -\$2.64 | -\$0.86 | -\$1.60 | -\$0.81 | -\$1.56 |        |        |
| Average Rotation Earnings           | -\$1.83 |         | -\$1.23 |         | -\$1.19 |         |        |        |

soybeans has been a little different. In 2013, rotation soybean production costs were \$4.43 per bushel. These costs declined to \$4.12 in 2016, a decline of 7%. There have been increases in the per unit production costs for 2017, 2018, and 2019. The 2019 estimate is \$4.52, a cost 2% more than in 2013.

Subtracting per unit production costs from the price of corn and soybeans provides the contribution margin. This is the money left to pay the expenses associated with investments in machinery and facilities, for family and hired labor, and farmland. In 2016, the contribution margin was \$1.07 per bushel (\$176.55 per acre) for rotation corn and \$4.28 per bushel (\$214.00 per acre) for soybeans. The cash

rent for average farmland during this period has averaged \$207 per acre, more than the contribution margin. This means there are no earnings to pay for machinery and facility investments and family and hired labor. Cash rents from 1996 to 2018 are presented in Figure 1.

As one considers cash rent for 2019, it is important to know on which side of average you are on. Per unit production costs vary widely. If your costs are below average, you have an advantage. What will you do to make the most of this advantage? If costs are above average, what is the strategy for lowering them?

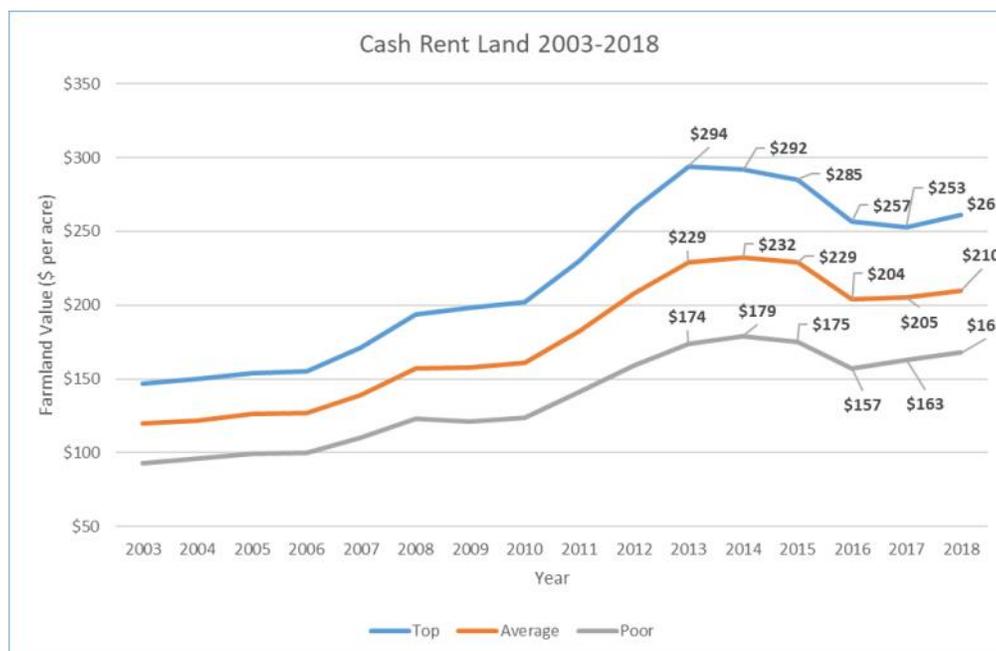


Figure 1. Cash rent values for Indiana farmland, 2003 - 2018

The bottom line message of these numbers is there is still a need to reduce costs, increase revenues, or both. What do these numbers mean for cash rent? In the average situation there is downward pressure on cash rent and other costs. Historically a decline in cash rent of 5% is a significant change in this extremely competitive market. The tight margins do not provide room for cash rents to increase. For next year, cash rents are more likely to be flat or down with a higher probability of stable cash rents than declining cash rents.

## Farmland Values

Average quality Indiana farmland reached a peak of \$7,976 per acre in 2014. The 2018 Purdue Farmland Value Survey indicated average quality farmland was valued at \$7,072 per acre, 11% less than the peak value and 2.1% more than the June 2017 value (Figure 2). While crop margins remain tight, the above trend yield of 2017 and prospects for better prices, helped lift farmland values in 2018. The optimism in the market was quickly lost with the shift in trade policy. The imposition of tariffs and the retaliatory response quickly dampened export demand. There was a hope that the trade war would be short lived, but instead we find ourselves in a 90 day cooling off period. This pause has postponed an increase in tariffs on Chinese imports. Over time trade flows

will adjust and the quantity of agricultural exports will likely rise, but this will take time.

Another important influence in the farmland market is the rise in long term interest rates. The Federal Reserve has been systematically raising short term rates. Long term rates have also been rising. Since the early 1980s, the economy has benefited from declining interest rates. If we are entering a period of rising interest rates, this will add another negative influence to the farmland market.

The major source of strength in the farmland market seems to be the reluctance of current owners to sell. There is not a source of objective data to determine if there is a smaller supply of farmland on the market now than previous, but there several antidotal indicators that point in that direction.

Tight margins, uncertainties about trade negotiations and tariffs, and rising long-term interest rates are likely to be negative enough to keep the farmland market from increasing in 2018. While there is continued concern about the financial strength of farmers, there is no pending crisis that is likely to force an increased supply of land on the market. It is expected that farmland values are likely to remain steady, with the possibility of a small decline if the trade news is negative.

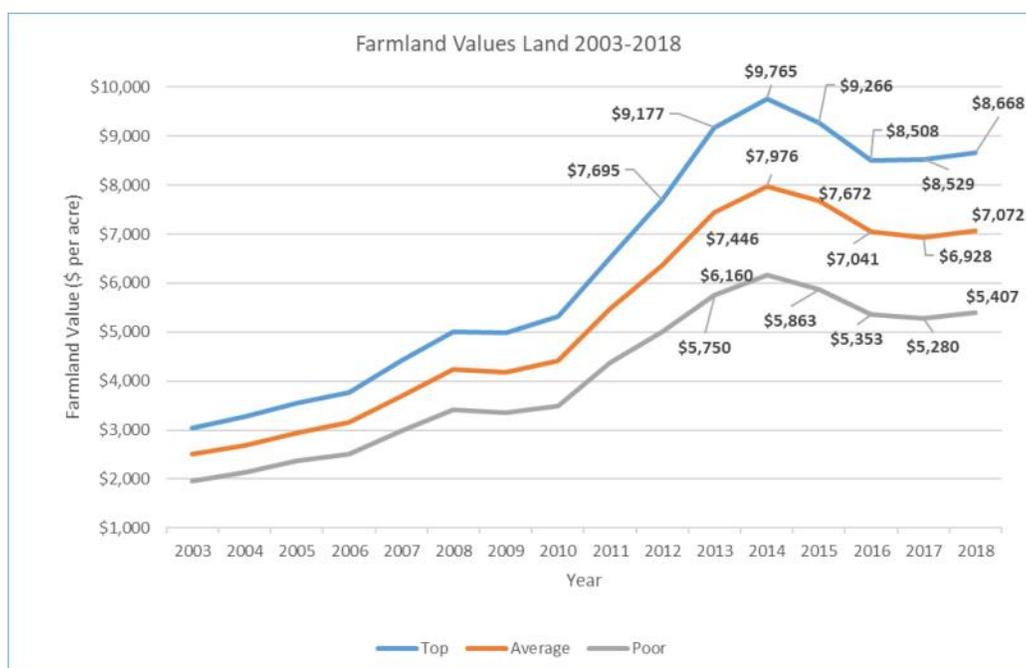


Figure 2. Farmland values for Indiana farmland, 2003 - 2018



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Registration for the Conference (January 11, only) is \$150 or \$50 for the Pre-Conference (January 10). Attend both days to receive a bundle discount and pay \$175. For more information, contact Sarah Zahn at [smithse@purdue.edu](mailto:smithse@purdue.edu), 765-494-7004, or visit <https://ag.purdue.edu/commercialag/Pages/Programs/Top-Farmer-Conference.aspx>.

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