

DECEMBER 2020



# PURDUE

## AGRICULTURAL ECONOMICS

### REPORT

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#### FROM THE EDITOR:

*Brady Brewer Assistant Professor of Agricultural Economics*

Welcome to the annual outlook issue of the Purdue Ag Econ Report (PAER), where take a look back over the previous year and also a look ahead at the economic conditions we can expect for the agricultural sector for 2021.

This past year was filled with a lot of uncertainty in the agricultural markets. A lingering trade war, weather issues, and the COVID-19 pandemic, impacted prices and brought change to all parts of the agricultural value chain. These issues continue to impact the markets now and likely into 2021.

In the following PAER articles, Agricultural Economics Faculty at Purdue University provide insight on the critical issues facing farmers and the agricultural value chain in 2021.

To view previous articles or for more information about the Purdue Ag Econ Report, visit <https://purdue.ag/paer>.



# PURDUE

## AGRICULTURAL ECONOMICS REPORT

**Title:** Farmland Values and Cash Rent  
**Author:** Todd H. Kuethe  
**Series/Article ID:** *Ag Outlook for 2021; PAER-2020-19*  
**Date:** December 3, 2020  
**Tags:** Farmland prices, cash rent  
**Summary:** There are number of signs of optimism for farmland prices, yet continued economic uncertainty remains. Cash rental rates are likely to see upward pressure despite recent low or negative returns on rented land.

### Farmland Values

Indiana farmland prices increased in 2020, following several years of modest declines from the 2014 peak. The 2020 [Purdue Farmland Values and Cash Rent Survey](#) indicated that high quality land values increased by 4.5% to \$8,579. Average quality land values increased by 3.2% to \$7,236, and poor quality land values increased by 6.3% to \$5,746. It is important to note that the price increases between June 2019 and June 2020 were concentrated in last half of 2019, and prices moderated slightly from December 2019 to June 2020 (Kuethe and Dobbins, 2020). The majority of Purdue Land Values and Cash Rent Survey respondents anticipated the modest declines to continue through the remainder of 2020.

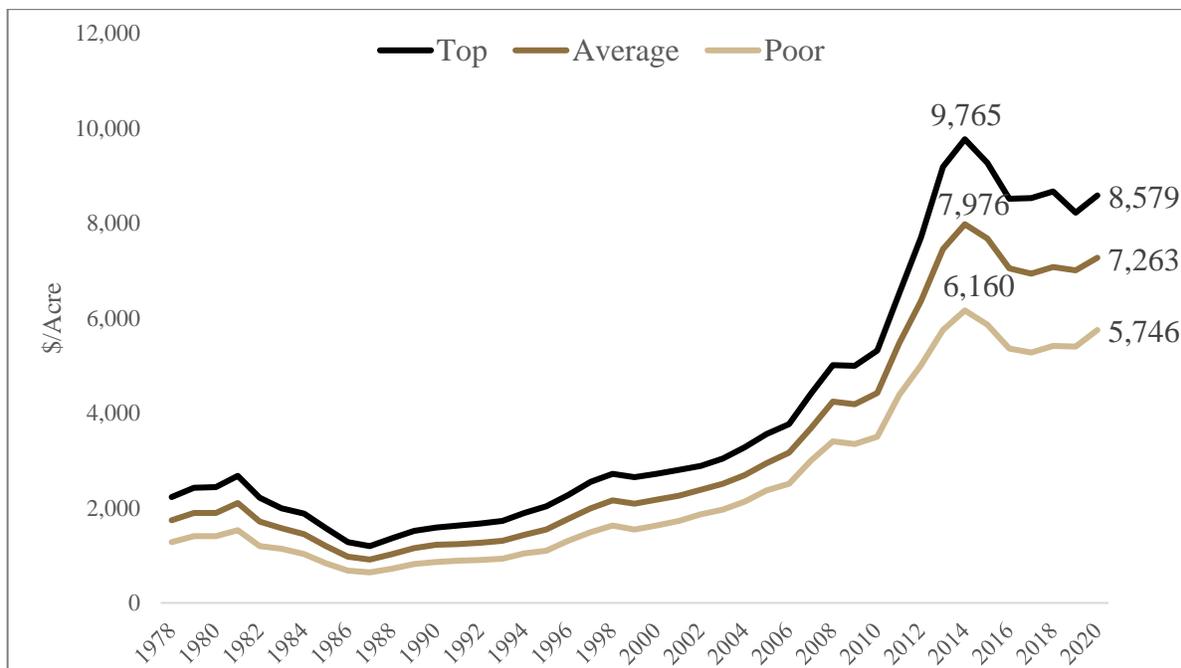


Figure 1 Purdue Farmland Value Survey, 1978-2020

Farmland prices are determined by a complex set of economic forces, including expected returns from agricultural production, the cost of borrowing (or interest rates), and potential growth in future returns. As of this writing, recent results from the [Purdue University-CME Group Ag Economy Barometer](#) suggest farmers are optimistic for both current and future expectations of the agricultural economy which should place positive momentum on farmland values. In addition, the current economic certainty should ensure that interest rates and the costs of borrowing remain low. Low interest rates also provide support to farmland prices. Finally, given the high levels of uncertainty, many prospective buyers may choose to hold current farmland investments and delay potential sales. For several years, the limited supply of farmland on the market has bolstered sales prices. Thus, a number of forces are expected to provide positive support for farmland prices which may result in higher values in 2021.

However, one of the key lessons of 2020 is that many expectations will go unrealized and economic conditions can change quickly. The high degree of economic uncertainty will likely remain as long as the nation and our economy struggles with COVID-19. In addition, a change in Presidential Administration and Congress in early 2021 may impact a number of important policy decisions related to agriculture, the environment, energy, and trade. It is still far too early to tell how these changes will work their way through the land market.

There is a belief that farmland is the residual claimant of the farm sector. That is, the economic returns to agricultural production accrue to farmland. As shown in Figure 1, farmland prices rise and fall according to general trends in commodity prices and the cost of production. If our relationships with major trading partners and the demand for fuel, food, and fiber provided by agricultural commodities continues to improve, farmland prices will capture these changes. However, if trade and consumption patterns are adversely affected by broader economic uncertainty, farmland prices would also be expected to decline.

## **Cash Rental Rates**

Over the last decade, cash rental rates across Indiana increased dramatically during the commodity price boom but then moderated as operating margins tightened. Since 2016, cash rental rates have held relatively steady, yet the most recent Purdue Land Values and Cash Rent survey reported an increase in cash rental rates from 2019 to 2020 (Kuethe and Dobbins, 2020). When 2020 cash rental rates were set, many farmers and landowners justified higher rental rates given decreasing variable costs of production and an optimistic view of the agricultural sector going into the 2020 growing season. For example, the [Purdue Ag Barometer](#) suggested more optimistic future expectations coming out of the 2019 growing season. However, as we all know, the economic conditions of 2020 were made surprisingly difficult following the emergence of COVID-19 in early Spring.

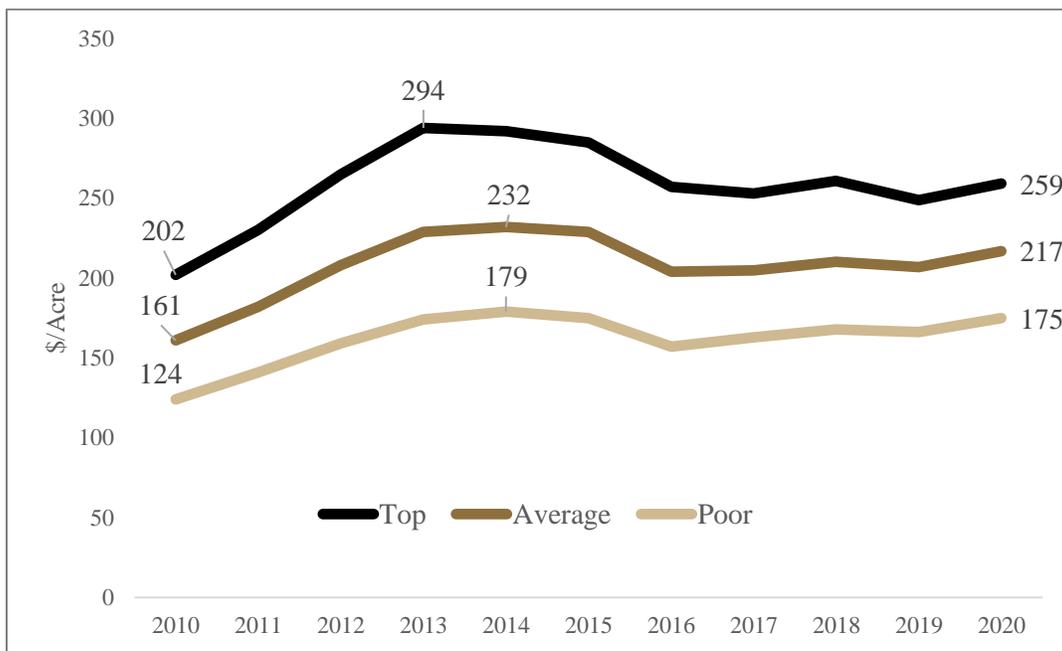


Figure 2 Indiana cash rents from the Purdue Farmland Value Survey for 2010 - 2020 by land quality

Cash rental rates are typically negotiated well in advance of the growing season, and as a result, rental rates reflect the *expected* costs and returns to production. For 2021, Purdue’s [Crop Cost and Return Guide](#) suggests an expected corn yield of 180 bushels per acre for rotation corn on average quality farmland. With an expected harvest price of \$3.65, the anticipated market revenue is \$657 per acre. The Guide also reports expected variable costs of \$403 per acre. The difference between the market returns and variable costs is called the contribution margin or operator and land return. Thus, for 2021 the expected contribution margin for rotation corn on average quality farmland is \$254 per acre. Thus, farm operators are expected to obtain \$254 per acre to allocate to unpaid labor, investment in machinery and facilities, and cash rent. For average productivity farmland, rotation soybeans are expected to provide a contribution margin of \$286 based on expected yield of 55 bushels per acre, \$9.45 harvest price, and variable costs of \$234 per acre.

As shown below, the expected 2021 contribution for both (rotation) corn and soybeans is above those of 2020. The contribution margin for rotation corn is 41% higher than 2020 and for soybeans is 32% higher than 2020. Increasing margins generally signal an upward pressure on cash rental rates, as farm operators will have additional revenues to allocate to labor, investment, and land. However, the figure also shows that for a number of years, the contribution margin for corn has been below the cash rental rate for average quality land. In addition, the 2020 cash rental rate of \$217 per acre was above the contribution margin for both corn (\$180 per acre) and soybeans (\$216 per acre). As a result, farm operators will likely seek to reduce cash rental rates for the coming year, based on the experiences of 2020.

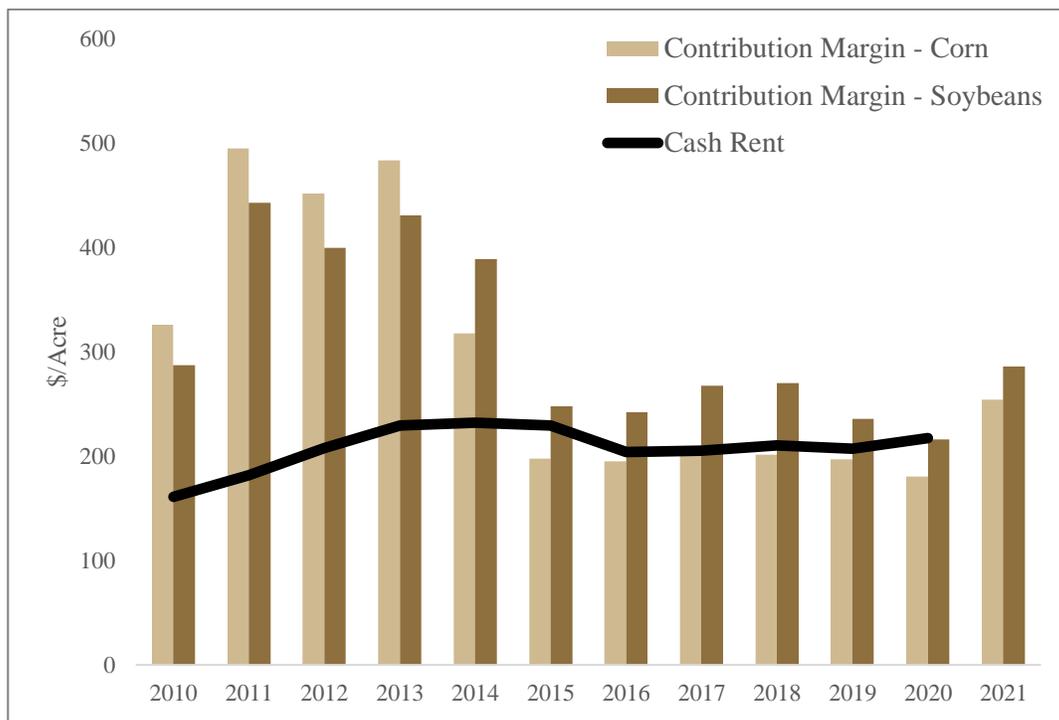


Figure 3 Cash rental rate and contribution margin for corn and soybeans for average quality land, 2010-2021

It is important to note that cash rental rates are determined by the marketplace. Thus, an agreement must be reached by the competing interests of landowners and farm operators. Both landlords and tenants should consider the potential for variation in costs and returns of agricultural production given current uncertainties. It is likely that in the current environment differences in contribution margins across farms will be significant. Reaching an agreement will take open and frank discussions on both sides of the lease agreement.

### References

Kueth, T.H. and C.L. Dobbins (2020) "[Indiana farmland values increase but signal concern of potential COVID-19 slump](#)" *Purdue Agricultural Economics Report*.



# PURDUE

## AGRICULTURAL ECONOMICS REPORT

Title: 2021 Trade Policy Outlook: What should we expect from a Biden Administration?  
Author: Russell Hillberry  
Series/Article ID: *Ag Outlook for 2021; PAER-2020-20*  
Date: December 3, 2020  
Tags: Trade, policy, international trade  
Summary: U.S. international trade policy played a surprisingly small role in the presidential election campaign. What changes to trade policy should we expect from President-elect Biden?

### **2021 Trade Policy Outlook: What should we expect from a Biden Administration?**

The near absence of a debate over U.S. international trade policy in the recently concluded Presidential election campaign was surprising. President Trump, the self-proclaimed “Tariff Man,” broke sharply with a decades-long, bipartisan approach to U.S. international trade policy. By contrast, President-elect Biden has a long history of support for this broad consensus, which has favored US leadership of allied countries in the creation of a mutually interdependent and more prosperous world. Given their sharp differences over trade policy - both in style and in substance - one might therefore have expected trade policy to play a bigger role in the election campaign.

In the trade policy outlook for 2021, the primary question is, “what should we expect President Biden’s trade policy to look like?” This question is not all that easy to answer. As a candidate, Biden made some commitments on trade policy, but these specific promises may be difficult to implement without unified Democratic control of Congress. On the more pressing issues of how to manage the trade policy situation left by President Trump, Joe Biden the candidate offered some generalities, but avoided specifics. This review is therefore somewhat speculative, and based on my own reading of the situation.

Perhaps the key thing to understand about President Trump’s trade policies is that most were implemented without the participation of Congress. This means that these policies should be rather easy for President Biden to reverse, at least from a legal point of view. Although President Biden should be expected to reverse many of President Trump’s policies over the course of his administration, it is unlikely that he will undertake the whole of this task immediately. He has other priorities that will take precedence over trade policy. He also has an opportunity to exploit the flexibility that President Trump has left him in this area.

## **U.S. tariffs on goods from Europe and other traditional allies**

International trade policy is not only an economic policy, it is also an important component of U.S. Presidents' foreign policy toolbox. One of the sharpest departures President Trump took from the pre-existing U.S. trade policy consensus was the 2018 decision to use a national security exception in US trade law to impose taxes on imports of aluminum and steel.

Controversially, traditional U.S. allies were included in the list of countries whose exports would be taxed. The European Union, among others, responded to these tariffs by placing retaliatory tariffs on US exports, including exports of agricultural products. While longstanding trade frictions between the US and EU will remain (e.g. the appropriateness of subsidies paid to Boeing and Airbus), President Biden has made it clear that he plans to seek a rapprochement with the EU and other allied countries. It is likely that negotiations to reduce the tariffs imposed during the Trump administration – in both directions – will be one of the earliest significant trade policy changes undertaken by the Biden Administration. Reducing frictions with traditional US allies would also facilitate other trade policy actions that President Biden hopes to undertake.

## **Rebuilding US influence at the World Trade Organization (WTO)**

In the case of international trade policy, President Trump's general hostility towards international institutions manifested itself as a unilateral US effort to hamstring the WTO's mechanism for resolving trade disputes among its members. More recently, the administration has delayed the selection of a new Director General for the WTO, despite the leading candidate's widespread support from countries that are often aligned with the U.S. Traditional American thinking on the subject sees the multilateral trading system, now represented by the WTO, as an important achievement of both US foreign and economic policy. In his long Senate career, President-elect Biden showed a keen interest in US foreign policy issues, and was typically a backer of the broad bipartisan consensus on US international trade policy. It is likely that he will take a much more cooperative approach than President Trump did at the WTO. That said, there are a number of issues regarding WTO operations that US policymakers had sought to address even before President Trump took office. Expect President Biden to pursue similar WTO reforms as President Trump did on these issues, but to use a much more cooperative approach in his pursuit of these changes.

## **Trans-Pacific Partnership**

The most substantial trade policy goal of the Obama administration was the negotiation of the "Trans-Pacific Partnership (TPP)," a preferential trade agreement involving the United States and 11 other countries from North and South America and Asia. The economic objectives of the agreement included increased access of US ag products to large markets in Asia, among other things. The agreement also provided a strategy for reducing the influence of China, and/or encouraging China to change its trade policy stance (if it wanted to accede some day). Despite these benefits, President Trump decided not to submit the negotiated agreement to Congress. The other 11 members of the agreement went ahead with a slightly modified agreement, and remain open to US accession to this group.

As a member of the Obama Administration, then Vice-President Biden supported the TPP. As a Presidential candidate, he said that he supported the overall concept, while also saying that he would want to renegotiate specifics. Accession to the TPP is perhaps the most straightforward way that President Biden could significantly expand US agricultural exports. But the domestic politics of joining the TPP are likely to be quite tricky. It is unlikely that there will be much

support for such a move on the Democratic side of the aisle; and President Trump's fierce hostility to the deal may also make it difficult to assemble Republican votes. It is therefore unlikely that US accession will happen early in Biden's term, if it happens at all.

## **China**

For the foreseeable future, the most difficult trade policy issue facing US Presidents will be China. Officials in the Trump Administration shared many of the same concerns about China as earlier administrations. These concerns included China's failure to abide by commitments it had made to protect intellectual property rights, and the significant ongoing role of state-owned enterprises in the Chinese economy. The concerns are shared by leaders of many countries, especially leaders of other prosperous countries. President Trump decided to try to change China's behavior without the help of those allies, unilaterally imposing U.S. tariffs on Chinese goods. Those tariffs generated retaliation from China, including tariffs on US exports of soybeans and other agricultural goods. President Trump's "phase-one" agreement with China was mostly a face-saving exercise that offered China a cease-fire in exchange for purchase commitments that went unmet.

Expect President Biden to eventually refocus attention on the issues that initially motivated the dispute: intellectual property rights, state owned enterprises, etc. While President-elect Biden's goals might be quite similar to President Trump's initial rationale for the trade war, the strategic approach to addressing these issues will be very different. Biden will almost certainly abandon Trump's go-it-alone strategy; seeking instead to coordinate an international response, possibly through the WTO. But it is also likely that a President Biden will use the existing tariffs as leverage to pursue his agenda. The key change in this regard might be that a President Biden will be less focused than President Trump was on using this leverage to increase sales of agricultural products. He is more likely to focus on the initial sources of friction: intellectual property protection and state-owned enterprises.

## **Market Facilitation Program payments**

Exporters of agricultural products to China suffered collateral damage as a result of the trade war. A key way that President Trump sought to mitigate this damage was to use discretionary powers to channel funds from the U.S. government's Commodity Credit Corporation to make payments to farmers of crops that faced increased Chinese tariffs. Although these payments are not a trade policy, *per se*, President Trump clearly linked this policy to the trade war and so we include it here. These payments were made under the President's discretion, which would seem to leave the decision to reduce or eliminate these payments in the hands of President Biden. It seems likely that a President Biden will reduce or eliminate these payments, relative to their current levels. Reduced payments under the program, together with a reorientation away from domestic ag exports as the focus of short-term policy toward China, will be a double-edged sword for producers of the affected commodities.

## **Buy American**

The most prominent of Presidential candidate Biden's trade policy proposals was a plan to increase the share of US-produced content in US government purchases. The proposal is likely to conflict with existing US commitments, at the WTO and in other US trade agreements. If implemented on a significant scale, the Buy America plan may complicate Biden administration objectives mentioned earlier, especially the more collaborative approach he plans to take with US allies. It is unclear whether such a proposal would have significant direct effects on US

agriculture; it is likely to have its biggest impact on US infrastructure investments. If implemented, and found to be inconsistent with WTO rules, a change to the Buy America program might draw retaliatory tariffs that once again hit US agriculture. It does seem, however that this plan is a Biden priority; he mentioned it prominently in the first presidential debate. Expect the Biden administration to pursue this policy almost immediately, but significant changes will likely require Congressional approval.

### **Carbon tariffs**

Another trade policy area that was prominent in the Biden campaign was a plan to impose tariffs on exports of countries that lack carbon taxes or other limits on carbon emissions. This kind of plan would make most sense only after the US put in place a comprehensive plan to address climate change; something that may be unlikely to happen if Republicans control the Senate. An interesting aspect of the issue surrounding carbon tariffs is that the same “national security” clause that President Trump used to implement tariffs on Aluminum and Steel might offer President Biden the authority to impose carbon tariffs without Congressional approval. It does seem that addressing climate change is a high priority for the Biden administration. He may seek to use this authority as part of those efforts, though carbon tariffs would be most effective as part of a comprehensive plan to “price” carbon emissions, which would require action by Congress.



# PURDUE

## AGRICULTURAL ECONOMICS

### REPORT

Title: 2021 Agricultural Credit Outlook  
Author: Brady Brewer and Todd H. Kuethe  
Series/Article ID: *Ag Outlook for 2021; PAER-2020-21*  
Date: December 3, 2020  
Tags: Agricultural lending, interest rates, market outlook  
Summary: Low interest rates, low demand for loans, high repayment rates, and fund availability suggest agricultural credit markets well positioned for 2021.

Despite an otherwise tumultuous 2020, the agricultural credit markets continued many prior trends. Specifically, interest rates, loan demand, and farm loan delinquencies continued to decrease through 2020. These are positive signs for the agricultural credit market, for lenders and farmers alike. Although under pressure from both trade disruptions and the COVID pandemic, government support payments to the agricultural sector bolstered farm cash flows. This support helped farmers seeking to lower loan balance and to repay a higher percentage of existing lines of credit. This article examines the trends in three key parts of the agricultural credit markets: interest rates, the demand for loans, and non-performing loans. We examine data obtained from the two Federal Reserve banks that serve Indiana. As shown in Figure 1, 68 counties in northern and central Indiana are part of the Federal Reserve Bank of Chicago region, and the remaining 24 counties in southern Indiana are part of the Federal Reserve Bank of St. Louis.

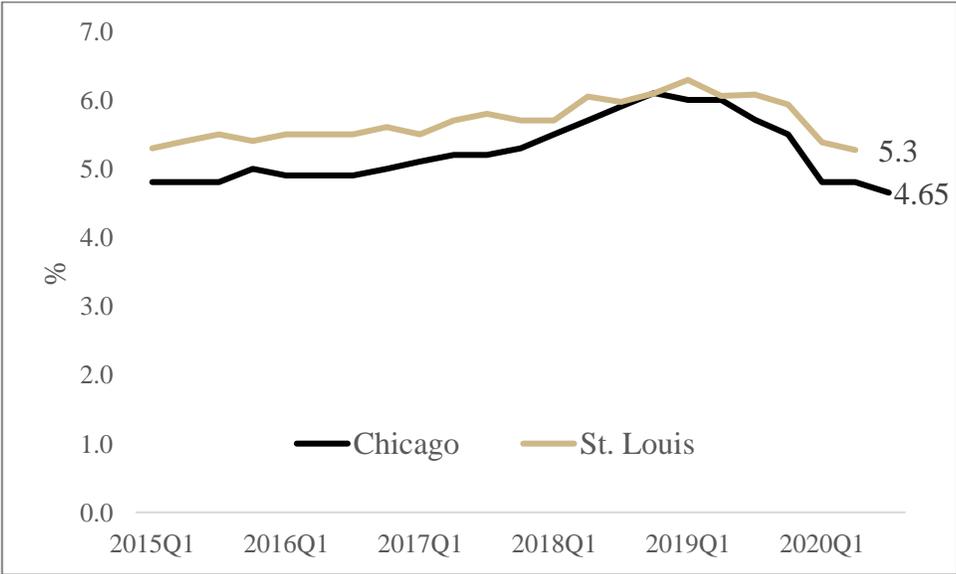


*Figure 1: Chicago and St. Louis Federal Reserve Districts*

Both Federal Reserve banks conduct quarterly surveys of agricultural bankers in their region. The surveys address important issues in farmland and agricultural credit markets. It is important to note that both Federal Reserve regions cover a large areas with diverse agricultural sectors. Thus, local conditions may deviate from broad, regional trends. At the time of writing, data for the St. Louis Federal Reserve district were available through the second quarter of 2020 through the Federal Reserve Bank of Kansas City’s [Agricultural Finance Updates](#), and data for the Chicago Federal Reserve district were available through the third quarter of 2020 through the bank’s [AgLetter](#) publication.

**Interest Rates**

In 2020, interest rates continued the downward trend that started in 2019. Figure 2 plots the average interest rate on farm operating loans since the first quarter of 2015 for both Chicago and St. Louis Fed districts. Farm operating loans are defined as those used primarily to finance current crop production expenses and the care and feeding of livestock (including poultry). The most recent survey results suggest an average interest rate of 5.3% for the St. Louis region and 4.65% for the Chicago region. The rates are the lowest recorded in more than 50 years.



*Figure 2 Average Fixed Interest Rate on Operating Loans, 2015Q1 - 2020Q3*

Figure 3 similarly plots the average fixed interest rates on long-term farm real estate loans. The most recent survey results suggest an average farm mortgage rate of 4.8% in the St. Louis Fed district and 4.24% in the Chicago Fed district. Again, the rates are at the lowest recorded in more than 50 years.

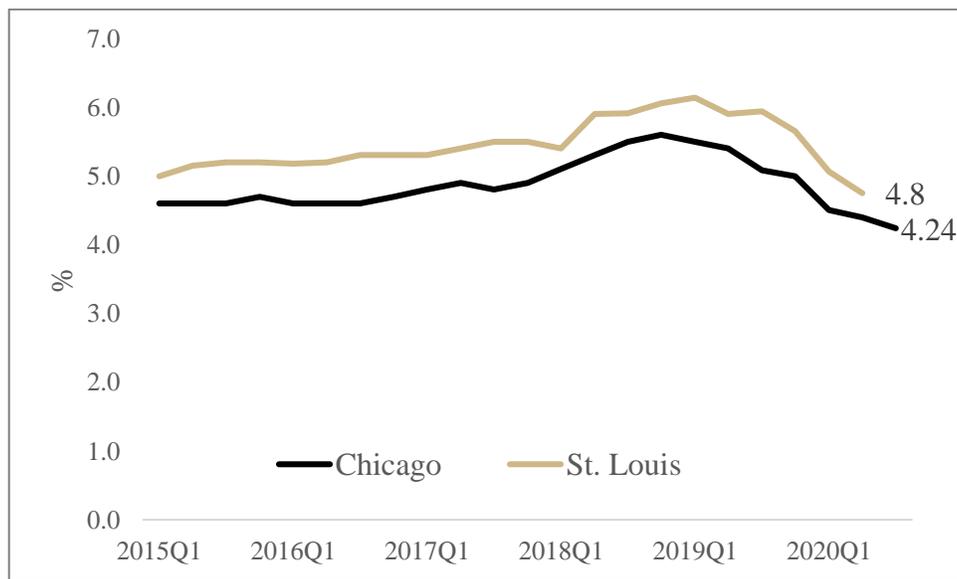


Figure 3 Average Fixed Interest Rate on Long Term Farm Real Estate Loans, 2015Q1 - 2020Q3

The decline in interest rates through 2020 was aided by the Federal Open Market Committee (FOMC)’s decision to cut the federal funds rate in response to spiking unemployment rates at the onset of the COVID pandemic. The FOMC sets the federal funds rate, the rate at which commercial banks borrow and lend their excess reserves to each other overnight, in an effort to control unemployment and inflation. Previously, the Fed has held an inflation target of 2%. However, the Fed recently changed its stance on inflation and is willing to allow inflation to rise above 2%. At the conclusion of the most recent FOMC meeting, Federal Reserve Chairman Powell reiterated that the fed funds rate would remain at current levels until the overall economy reached maximum employment and reached the inflation target. This provides a relatively robust signal that low interest rates will likely continue in 2021.

### Demand for Loans

The Federal Reserve Bank surveys ask agricultural bankers to rate the demand for loans at their institution relative to a year earlier. Respondents report whether the demand for loans is “higher,” “lower,” or the “same.” These responses are summarized by a loan demand index, calculated as the share of lenders reporting “higher” minus those reporting “lower” plus 100. Thus, when the loan demand index is less than 100, the demand for agricultural loans is decreasing. Figure 4 shows that the demand for agricultural loans decreased in 2020 relative to 2019. This is the first period of declining loan demand since 2013. This finding is consistent with aggregate financial information reported by the USDA ERS’ [Farm Income and Wealth Statistics](#), which showed lower levels of capital purchases, such as equipment and land.

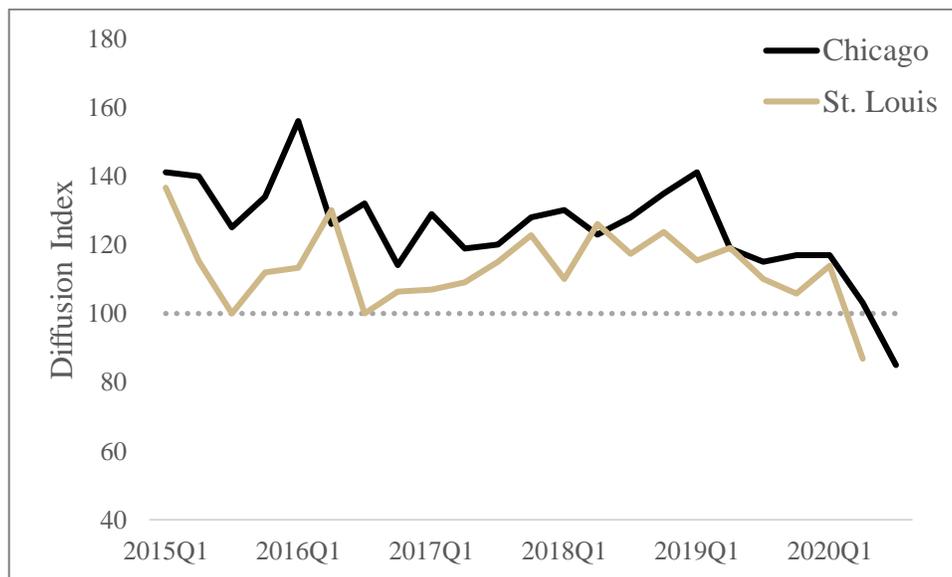


Figure 4 Demand for Agricultural Loans, 2015Q1-2020Q3

It should be noted that agricultural banks are well positioned for an increase in loan demand as agricultural lenders are reporting a higher amount of available funds to loan than in previous years. The similarly constructed funds availability index for both Federal Reserve Banks is plotted in Figure 5.

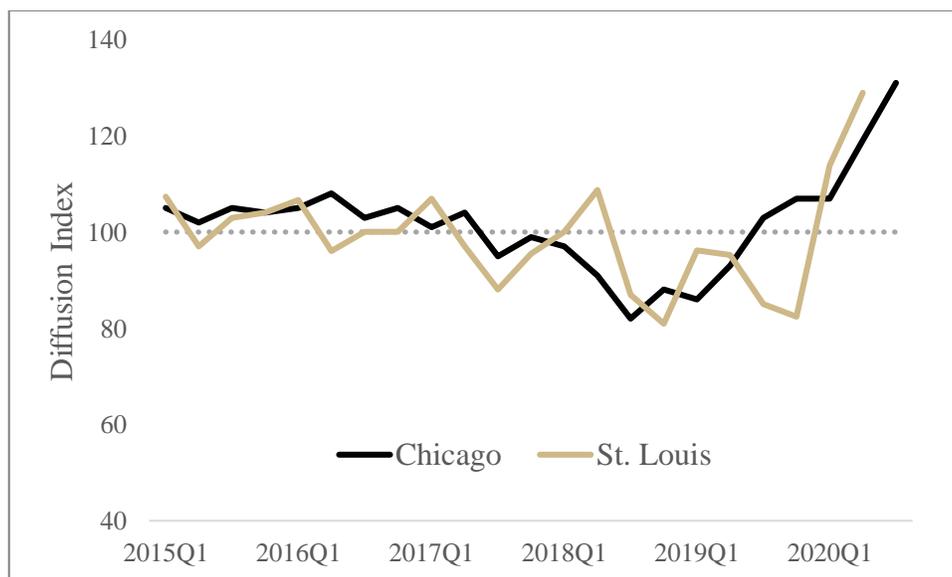


Figure 5 Availability of Funds at Agricultural Banks, 2015Q1 - 2020Q3

### Non-Performing Loans

Farmers' rate of loan repayment also improved in 2020, continuing a trend that began in 2013. The index is similarly constructed based on lenders reported repayment rates relative to the same quarter of the previous year. Given that the loan repayment rate indexes for both Chicago and St. Louis Fed surveys is below 100, the indexes suggest that farmers were able to pay off a greater portion of their debt. While the index is remains below 100 in Chicago, the repayment index is at

the highest level since 2012. This suggests that repayment rates may be slowing across the region.

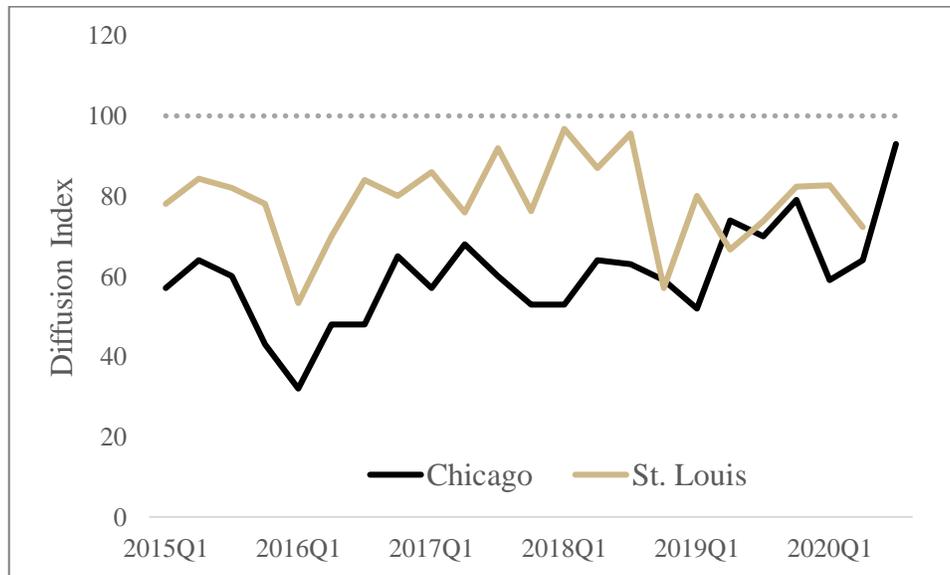


Figure 6 Loan Repayment Index, 2105Q1 - 2020Q3

A key component of loan repayment is net farm income. According to the USDA ERS, as much as 40% of a farmer’s 2020 income will come from direct government payments. This represented a 64% increase in the proportion of a farmer’s income that comes from government sources from 2019. The degree to which farmers can expect (or require) similar payments in 2021 is uncertain. The uncertainty is a result of many factors, most notably the lingering impacts of the COVID pandemic across the agricultural sector. Obviously, there is always a possibility that a decrease in revenue is not matched with an *ad hoc* program payment, but in a time of lower working capital, it could have an impact on a farmers ability to repay their debts.

Overall, the agricultural credit market is riding several positive trends into 2021. Farmers are likely optimistic that interest rates will remain at or near all time lows, which supports the acquisition of new capital assets. If farm loan demand increases, banks appear to have a sufficient stockpile of funds available to loan. Lenders will also be encouraged by the farmers’ loan repayment rates. While there is a high degree of uncertainty in commodity markets due to a number of factors, including the COVID pandemic and continued trade disruptions, the credit markets look to be well positioned in 2021.

## References

Oppedahl, D. (2020) “[Farmland Values and Credit Conditions](#)” *AgLetter* No. 1990, Federal Reserve Bank of Chicago.

Federal Reserve Bank of Kansas City (2020) “[Ag Finance Updates](#)” Second Quarter Federal Reserve District Ag Credit Surveys.



# PURDUE

## AGRICULTURAL ECONOMICS REPORT

Title: An uncertain horizon for farm policy  
Author: Roman Keeney  
Series/Article ID: *Ag Outlook for 2021; PAER-2020-22*  
Date: December 3, 2020  
Tags: Farm policy, agricultural policy  
Summary: Agriculture enters 2021 with uncertainty about not only the markets they will be supplying but the policy options that will comprise the safety net for farm incomes.

### **2021 Outlook – Agricultural Policy**

Economic policy for 2021 is set to be dominated by efforts to respond to the COVID-19 pandemic, both in terms of economic recovery and continued response to mitigation. Efforts to enact new stimulus and safety net extensions during the [second half of 2020 made little progress](#) as election positioning interceded and limited opportunities for negotiating legislation. The election itself yielded a change in the presidential administration and a Senate that remains undecided until runoff elections can be completed in January. All of this sets the stage for an uncertain year in economic policy in which agriculture's short term economic interests will be tied to the objectives of COVID recovery and a new presidential administration that has signaled interest in reversing course on the [trade](#), [immigration](#), [energy](#), and [environment](#) actions of its predecessor. In this outlook piece we first consider the larger economic policy environment and how actions may indirectly affect agriculture. That is followed by a consideration of agricultural policy agenda items and what we might expect to see in terms of signals, actions, and policy developments in 2021.

The international economic response to COVID-19 will determine the economic outlook for 2021 and performance of the agricultural sector is no exception. How countries manage the pandemic (i.e., limiting economic activity and adopting stimulus actions) will play a key role in the level and pattern of food demand around the world and by extension the market potential for US production. A new presidential administration eager to reverse trends on some isolationist economic policies is likely to see COVID-19 mitigation as an opportunity for international cooperation. Whether it is in international assistance for food and nutrition or in promulgating treatment, vaccination, and other health services around the world one would expect the new presidential administration to position the United States as a leader coordinating efforts.

Aside from international health and disease measures, the incoming Biden administration has already signaled a desire to re-engage the United States into international [climate policy by rejoining the Paris climate agreement](#). The [carbon targets of Paris](#), while voluntary and not [particularly ambitious](#), could present [opportunities for incentive policies in agriculture](#) that foster

carbon sequestration and in the production of renewable energy (e.g. feedstock for fuels, wind or solar farming). Finally, re-entry into international cooperation is likely to be partnered with efforts to [redress strained economic relations with China](#), an important importer of US agricultural products. A phase one deal with China was reached early in 2020 that brought a [commitment to significantly increase Chinese imports](#) of US products including crops but the entire phase one agenda has been impacted by COVID-19 which first closed much of China's economy and then did yield the same result in the United States. Post-COVID economic relations with China, and particularly the market access for US farm products will be a key signal to how the new presidential administration views agriculture's importance in commodity trade and their willingness to make concessions to ensure market access for agriculture.

In terms of policies that have a more direct impact in the food and farm economy, much of the policy activity of the past three years has been directly carried out by the Department of Agriculture (USDA) with the Trump administration using existing appropriated funds and legal structures to distribute price supports to farmers and make direct purchases of commodities. Previously these payments were made on the [basis of damages of the trade war](#) and [more recently as a COVID-19 relief package](#). Similarly, USDA and the administration were working to reduce nutrition assistance (SNAP) to payments by limiting eligibility waivers that have been extended to households participating in other low-income assistance programs. The incoming administration may have an interest in using the executive authority in continuing the direct subsidization of agriculture to bolster the farm and rural economy using similar safety net provisions and attempt to expand temporary eligibility for SNAP benefits, a [policy action that was previously adopted during the Great Recession](#). It may be more difficult for the incoming administration to enact policy unilaterally in the same manner however as [Republican legislators have expressed concerns over deficit levels](#) in discussions of further COVID-19 economic recovery and relief actions.

The uncertain policy environment is nothing new for agriculture in the 21<sup>st</sup> century. The trade war actions of the past few years have left farm operators to plan for each year without a clear picture of what foreign markets would be available to them and whether the additional safety net measures beyond those legislated in the farm bill would be made available. An early sign of how the presidential administration sees spending in agriculture will come in the new administration's first budget publication (typically in late February or early March) that highlights spending priorities and areas targeted for reductions. While the executive branch's budget is more of an agenda outline than a firm policy proposal it does set the marker for where the White House is likely to weigh in when Congress reaches impasse. Of particular interest will be how trade assistance payments of the past few years are viewed by the incoming administration and whether they are even mentioned in that document as part of anticipated spending going forward.

Of course, farm policy is most closely associated with the writing and enactment of "Farm Bills", omnibus legislation that packages programs for nutrition, commodity support, crop insurance, conservation, and a number of other initiatives. The current Farm Bill is set to expire in October of 2022 (start of Fiscal Year 2023), so there is always the possibility that the legislative process for a replacement for 2018's law would begin in 2021. The midterm elections of 2022 would likely stall efforts to complete a large comprehensive package making an early start in 2021 with a passage in the first two quarters of fiscal 2022 the only path to replacing the Farm Bill prior to expiration. The role of trade and the lack of resiliency of the commodity programs to support incomes in the face of significant export shocks will be a key consideration when the Farm Bill is taken up again.

The guiding principle of farm program design following the elimination of direct payments has been to make commodity payments work alongside insurance products to dampen losses for farms when market revenues are weak yet limit outlays when incomes are deemed sufficient. The experience of the trade war indicates that the price and revenue support programs as written [do not eliminate the need or political impulse to direct emergency spending to support agriculture](#). While there is debate over the size of the transfer payments and [whether they were over-large relative to the trade losses](#) they were designed to counter-act, it is clear that programmatic tweaks would be necessary to protect against precipitous price and income changes in the sector. This means the key policy questions for the commodity title of the next Farm Bill will focus on what mechanisms are needed to provide policy assurance to farmers that unforeseen shocks and disruptions in the trading environment will be met with predictable safety net payments and whether the budgeting of these comes at the expense of government's investment in using the public private partnership of crop insurance as its primary safety net mechanism going forward.



# PURDUE

## AGRICULTURAL ECONOMICS REPORT

Title: The Dairy Marketplace: Reflections on 2020 & Factors to Watch in 2021  
Author: Nicole Olynk Widmar  
Series/Article ID: *Ag Outlook for 2021; PAER-2020-23*  
Date: December 3, 2020  
Tags: Agricultural markets, dairy, economics, outlook  
Summary: Dairy and milk markets started 2020 in a reasonably well balanced state. March 2020 began a significant period of turmoil instigated by COVID-19, which included unprecedentedly rapid supply chain adjustments and massive – sudden - shifts in consumption behavior.

Dairy markets, like many agricultural markets, have experienced significant volatility due to the COVID-19 pandemic, in addition to more ‘benign’ supply and demand factors. Typically, in November we are in the midst of watching holiday baking take off, and along with it, U.S. butter usage and home consumption. More broadly end of year market summaries typically cover factors such as cow numbers, milk production per cow, and seasonal versus atypical consumption and/or buying patterns. However, in 2020 the cascading series of events beginning with the U.S. societal impacts of COVID-19 in March and April of 2020 dominate most food market discussions.

### **Fundamental Dairy Industry Metrics**

Forecasted total milk production for 2020 has been moving upward, with some expectations of more cows in the fourth quarter combined with higher milk per head. Presently USDA, ERS has 2020 total milk production forecasted at 222.5 billion pounds, which is a 0.2 billion pound increase over their October forecast. Increased milk production itself would place downward pressure on prices, but taken with recent demand signals, there is some room for cautious optimism. U.S. dairy prices are competitive presently on the global market; we’re expecting higher exports of cheese, butterfat, and dry skim milk products. While U.S. butter prices have been the focus of attention for multiple years, they have lowered considerably and presently even U.S. butter prices are competitive on the World market.

Per the [November 2020 Livestock, Dairy, and Poultry Outlook from USDA, ERS](#) the 2020 all-milk forecast has been raised by \$0.25 to \$18.25 per cwt; embedded in that expectation is the fourth quarter significant increase by \$0.85 to \$19.75 per cwt. The overall 2020 milk price doesn’t look bad, but the path to getting here has been anything but stable. Figure 1 displays the U.S. All Milk Price on a monthly basis, with the severity of the impacts of the rapid market adjustments in mid to late March being evident in the rapid falling of prices into April and bottoming out in May, before rebounding rapidly during the summer months.

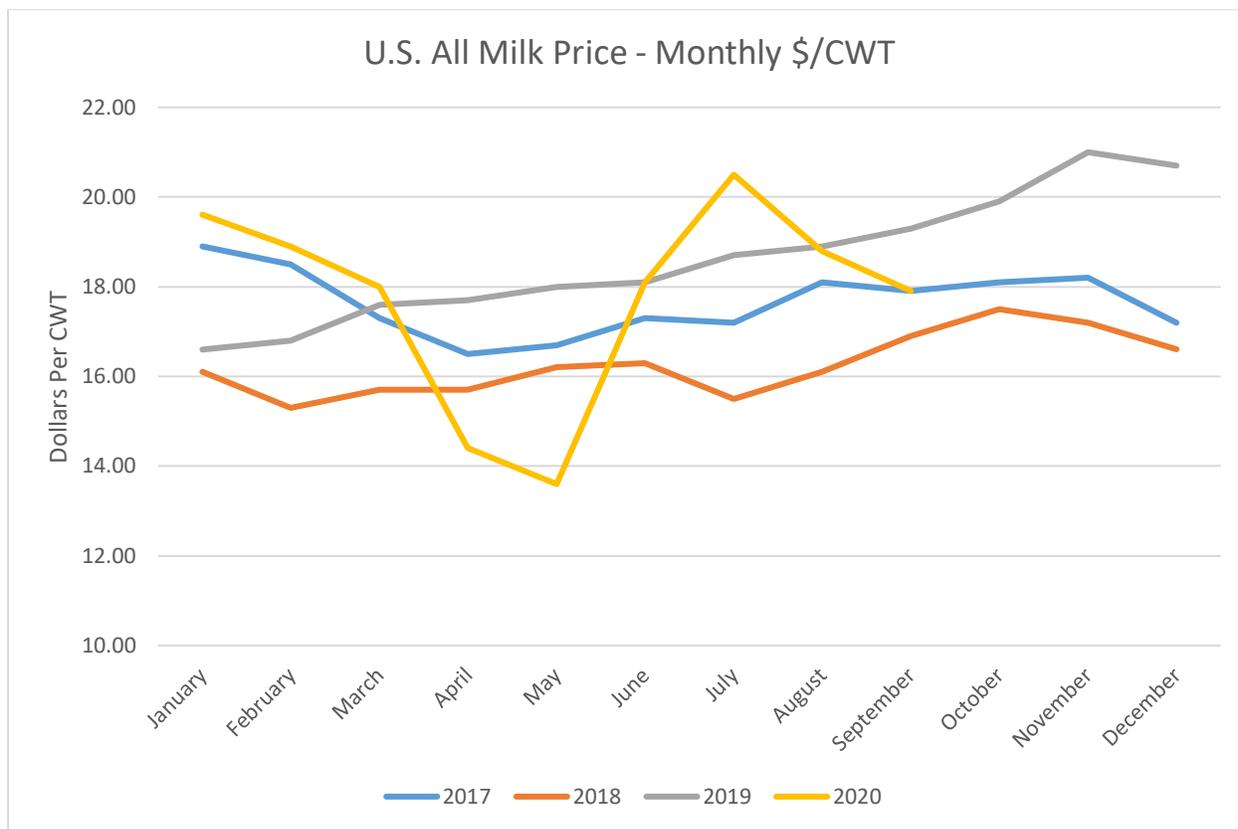


Figure 1. All Milk Price (Monthly; 2017-2020).

Data: All milk, fluid, and manufacturing milk prices from NASS Ag Prices monthly. Link is <http://usda.mannlib.cornell.edu/reports/nassr/price/pap-bb/>

### COVID-19 Adjustments: Reflections and Lingering Questions

The sudden transition to ‘stay at home’ in mid-March 2020 led to significant changes in shopping for food at home versus away from home, which impacted every food sector in the nation and most around the World. For dairy markets, however, there was the confounding issue of movement of children home from schools. Fluid milk in schools is a significant market; one can visually see consumption of fluid milk and a variety of dairy products move in synch with the school year. Fluid milk consumption declines reported currently are attributed at least in part to lowered school attendance during the pandemic.

Basically overnight the demand for milk in schools fell (to near zero) leaving raw milk without a home for processing, and [fueling national media stories](#) on milk dumping. While there was public outrage evident and the actual scale of milk dumping was drastically higher than usual, missing from much of the reporting was the relative localization of massive increases in dumping to the Northeast (and then Southeast, in that order).<sup>1</sup> Adding to the sting of dumped milk and (at the time) milk prices dropping rapidly, were the images of empty supermarket dairy displays as shoppers sought but could not find fluid milk. Undoubtedly dairy producers and the dairy

<sup>1</sup> For in-depth coverage of dumping in terms of % of production and by order/region, see <https://agmoos.com/2020/06/20/northeast-bore-brunt-of-huge-milk-dumping-in-april/>.

industry faced some dark times in March-May 2020, as did many industries and societies grappling with COVID-19.

Certainly, nobody wants to see milk dumped; there is an emotional response to seeing what we recognize as a wholesome, complete, food, often in the context of infants and children, wasted. However, what was largely missing from media coverage was the resilience shown by the milk supply and processing chain in the recovery/adjustments that followed. Considering the scale and speed of the adjustments necessary, the industry response was impressive. The duration when milk processing was unavailable for raw product was reasonably short-lived as the U.S. dairy industry worked to redirect product for processing, which includes a ‘heavy lift’ in terms of logistics of a perishable product requiring refrigeration combined with processing capacity and packaging availability. There was a brief period of time during which retail supermarkets struggled to keep fluid milk stocked on shelves as U.S. households moved home and stocked up on staple products. The transition to supplying more fluid milk for home consumption and less to restaurant and food service (including schools) was rapid and the supply chain showed resiliency, although admittedly not without some short-term adjustment pain.

Dairy consumption at home is simply different than in restaurants or food-service establishments for most U.S. consumers. Consumption of butter and cheeses are of particular interest in the food at home versus away from home discussion. Bread baskets with butter, cream and butter based sauces, and inclusion of items like cheeses and sour cream in dishes all tend to be more common in restaurant dishes or other ‘splurge’ type meals than every day at-home meals. In [a special report on eating out expenditures during COVID-19 by USDA, ERS](#) it was reported that, “In April and May 2020, food-away-from-home spending was down 50.8 and 37.2 percent, respectively, when compared to the same months one year ago.” Certainly the shift away from restaurant meals has changed how U.S. consumers eat. Butter stocks remain reasonably high presently, placing downward pressure on butter prices. Pizza is one of the biggest uses of mozzarella cheese in the U.S. marketplace, which is an interesting food category during the pandemic as it remained reasonably in-demand as a take-out item, even as households continue to stay at home and many continue to avoid in-person dining, even when it is available. Contrary to trends for a variety of cheese products, American-type cheeses have experienced an increase in demand during the COVID-19 era. Increased demand for American-type cheeses is fueled by at-home cooking and consumption, largely believed to be in conjunction with preparation of common comfort food items, such as macaroni and cheese.

### **Looking Forward to 2021**

USDA, ERS has released forecasted milk per cow for 2021 up 20 pounds (to 24,090 per cow) alongside a 10,000 head increase (to bring the national herd to 9.380 million head). While milk production is expected to be up in 2021, the many unknowns facing grain markets lead to questions about feed costs. Expectations of higher feed costs would place downward pressure on milk production growth, although there remains significant uncertainty surrounding costs of production and/or size of 2020 crops available for feed.<sup>2</sup> As of the [November 2020 Livestock, Dairy, and Poultry Outlook from USDA, ERS](#) the 2021 all-milk price forecast for 2021 had been

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<sup>2</sup> While milk price expectations have been bumping upward in recent forecasts, the cost of production is another key factor on producers minds as one looks ahead to their expected 2021 margins. Assistance in visualizing forecasted margins, taking into account expected milk prices and key input costs, such as feed, can provide useful insight for decision making purposes. See [Dairy Margin Coverage Decision Tool](#) for example visualization and the ability to conduct historical analyses.

raised to \$17.70 per cwt, which was a \$0.10 increase over the forecast a month earlier. All milk forecasts are the product of a variety of factors including Class I, II, III, IV milk prices, forecasted demand for dairy products domestically, dairy product in cold storage/stockpiles, and trade expectations.



# PURDUE

## AGRICULTURAL ECONOMICS REPORT

Title: Retail Food Price Outlook  
Author: Jayson L. Lusk  
Series/Article ID: *Ag Outlook for 2021; PAER-2020-24*  
Date: December 3, 2020  
Tags: Retail food markets, food prices  
Summary: Retail food markets have experienced extraordinary volatility in 2020, creating a great deal of uncertainty around food prices in 2021.

Grocery food prices rose markedly in the aftermath of the onset of COVID-19. According to the [Bureau of Labor Statistics](#), retail grocery prices spiked 2.6% from March to April 2020; this was the largest monthly change in the food at home consumer price index since the high inflation of the 1970s. COVID-related disruptions led to a run on grocery stores as consumers avoided restaurants and sought to stock up and fill pantries and freezers. In the third week of March 2020, [consumer spending](#) at groceries was a whopping 68% higher than at the first of the year. All that extra demand at grocery pulled up prices. Then, in April and May, shutdowns and slowdowns in beef and pork processing due to worker illnesses reduced the supply of meat products available, leading to a significant price increase for beef and pork.

While many of the food prices have come back down off the spikes in late spring and early summer, it remains the case that retail food prices are significantly higher now than at the same time last year. In October (the last data available), prices of food at grocery were 4% higher than the same time last year. It's been almost a decade, since 2011, that we observed this rate of annual food price inflation. Despite the restrictions on eating out, the price of food away from home is 3.9% higher in October 2020 than in October 2019; this year-over-year change is higher than has been observed in at least a decade.

These year-over-year increases are significantly higher than the what has typically been experienced. From 2000 to 2019, the average annual change in retail grocery prices was about 1.9%. In fact, throughout much of 2015 and 2016, retail grocery prices actually fell relative to the year prior.

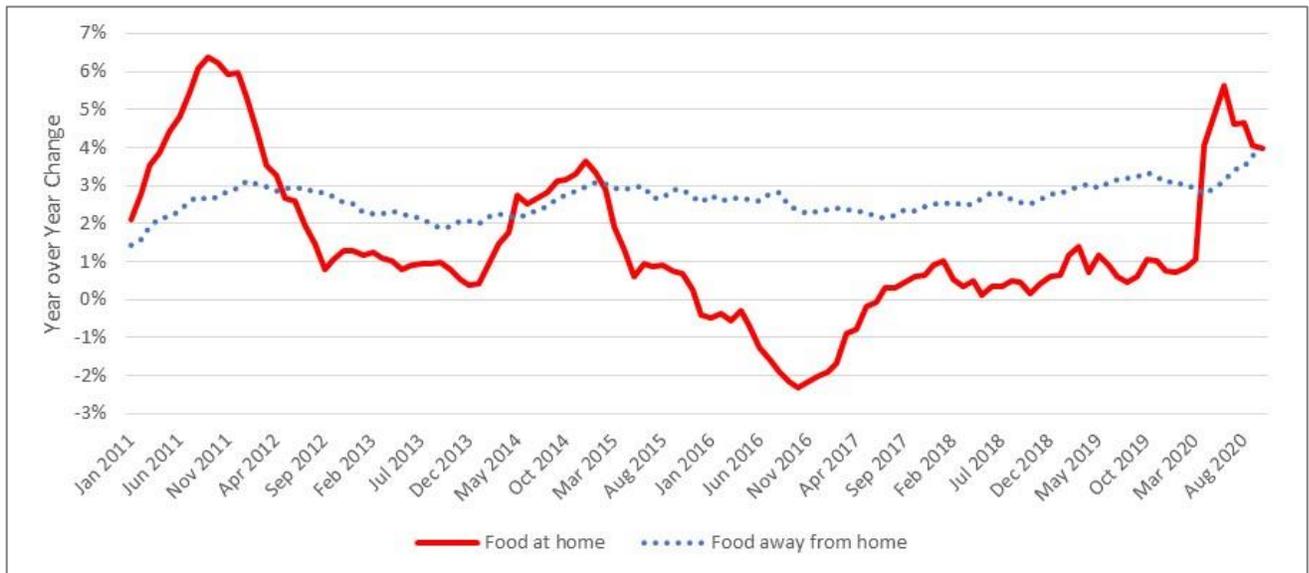


Figure 1. Year over Year Changes in Monthly Food Prices

Fluctuations in meat, dairy, and egg prices have been the biggest drivers of the overall food price hike. In June 2020, prices of these products at grocery were 12.8% higher than the same time in 2019; as of October 2020, prices of these products are still running 6.1% higher than in 2019. However, the price increases are not just limited to meat and animal products. Cereal and bakery product prices are 3% higher in October 2020 compared to October 2019; Fruit and vegetable prices are 2.6% higher in October 2020 than in 2019.

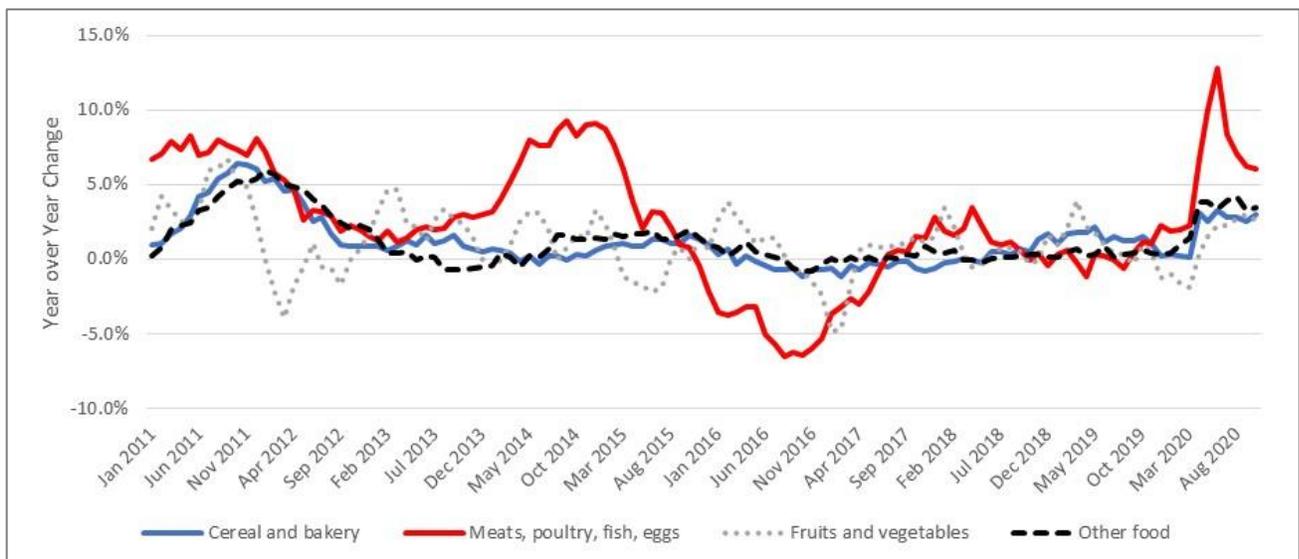


Figure 2. Year over Year Changes in Monthly Prices of Four Grocery Categories

There is good reason to believe that food price inflation is even higher than what is reported by the Bureau of Labor Statistics. Many products were stocked out and groceries limited the

amount consumers could buy (e.g., two packages of ground beef per customer). In these cases, the real price experienced by the customer are much higher than the sticker-price (one might say the price of a stocked out item is infinitely high). Moreover, the BLS [explained](#) that prior to COVID-19, most price data were collected in-person, but when they moved to online data collection to protect their workers, they had to dramatically reduce the volume of price data being collected. As a result, there were many items, such as the prices of turkey prior to Thanksgiving, for which not data were reported.

Looking ahead to 2021, the U.S. Department of Agriculture. [Economic Research Service](#) is projecting a return to more modest levels of food inflation. For food at home, they project a 1% to 2% increase in prices (the 20 year historical average is 2.8%), and for food away from home, the projection is 2% to 3% (the 20 year historical average is 2.3%).

These projections seem to suggest an anticipation of a return to normal. However, we are not out of the woods. As of the first of November 2020, [consumer spending](#) at grocery remains 11% higher and restaurant and hotel spending 30% lower than the first of 2019.

Even if food price inflation reverts to historical norms, this just means that prices have stopped increasing as fast as in 2020. Price levels remain higher than they were previously. As such, it will be important to keep an eye on food affordability and measures of food insecurity in 2021.



# PURDUE

## AGRICULTURAL ECONOMICS REPORT

**Title:** 2021 Purdue Crop Cost and Return Guide  
**Author:** Michael Langemeier and Craig Dobbins  
**Series/Article ID:** *Ag Outlook for 2021; PAER-2020-25*  
**Date:** December 3, 2020  
**Tags:** Corn, crop cost & return guide, fertilizer, soybeans, wheat  
**Summary:** Expect tight margins for 2021. Dr. Langemeier and Dobbins emphasize the importance of carefully scrutinizing input and crop decisions. Producers encouraged to create crop budgets and, in general, improve their record keeping.

The 2021 [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 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 mid-November.

**Table 1. 2021 Purdue Crop Budget for Average Productivity Soil.**

	Continuous Corn	Rotation Corn	Rotation Soybeans	Wheat	Double-Crop Soybeans
Expected Yield per Acre	169	180	55	77	39
Harvest Price	3.80	3.80	10.10	5.70	10.10
Market Revenue	\$642	\$684	\$556	\$439	\$394
Less Variable Costs					
Fertilizer	120	111	47	71	35
Seed	111	111	67	44	78
Pesticides	58	58	50	30	45
Dryer Fuel	33	27	0	0	5
Machinery Fuel	12	12	8	8	5
Machinery Repairs	22	22	18	18	15
Hauling	17	18	6	8	4
Interest	12	11	7	6	6
Insurance and Miscellaneous	38	38	34	9	9
Total Variable Costs	\$423	\$408	\$237	\$194	\$202
Contribution Margin	\$219	\$276	\$319	\$245	\$192

See ID-166-W for more detail, November 2020 Estimates.

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 \$219 per acre for continuous corn to \$437 per acre for wheat/double-crop soybeans. The contribution margins for rotation corn and rotation soybeans on average productivity soil are \$276 and \$319 per acre, respectively. The contribution margin is used to cover overhead costs such as machinery costs, family and hired labor, and cash rent. Failure to adequately cover these overhead costs typically puts downward pressure on cash rent and land values.

From 2007 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 \$38 per acre during the 2007 to 2013 period. The situation was considerably different from 2014 to 2020. The average difference in the contribution margin during this period was an advantage for soybeans of \$69 per acre. The projected difference in contribution margins between corn and soybeans for 2021 is \$43 per acre.

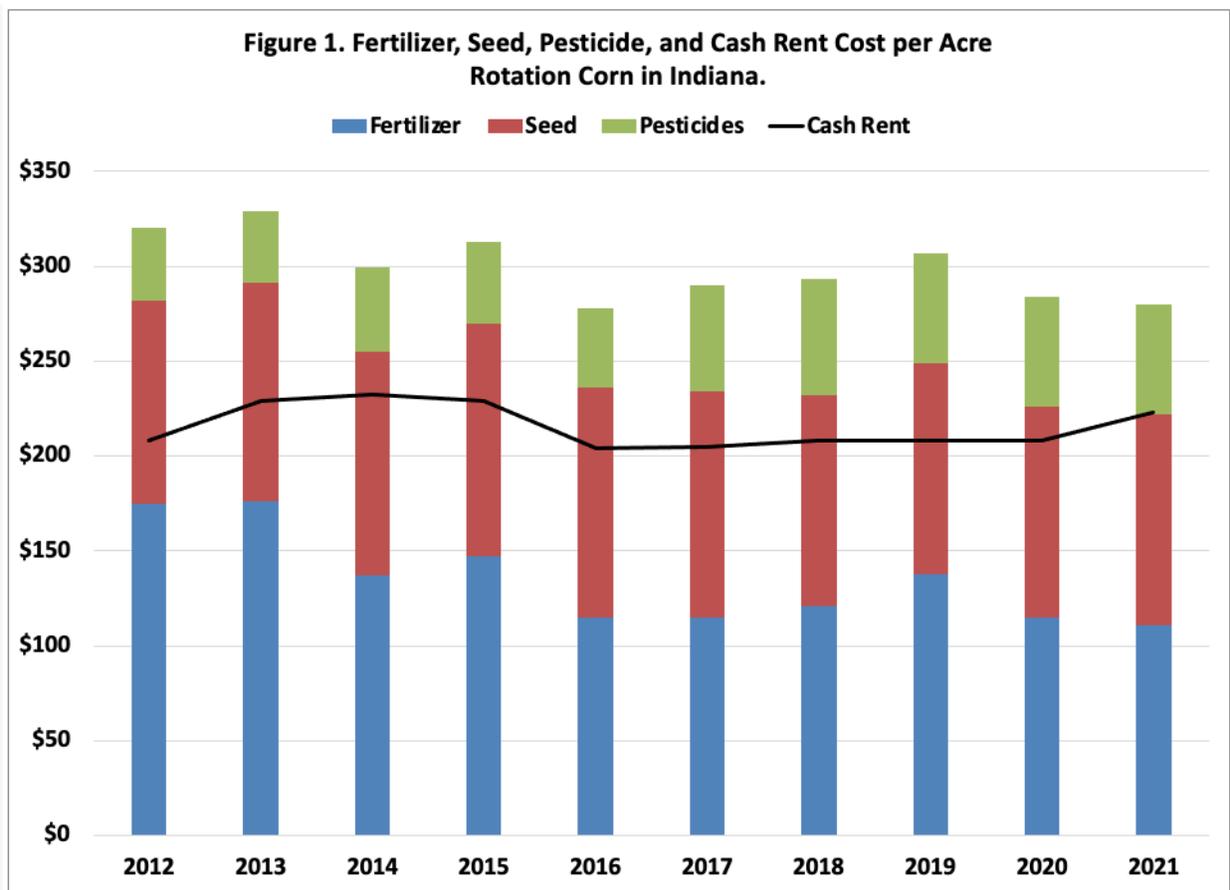
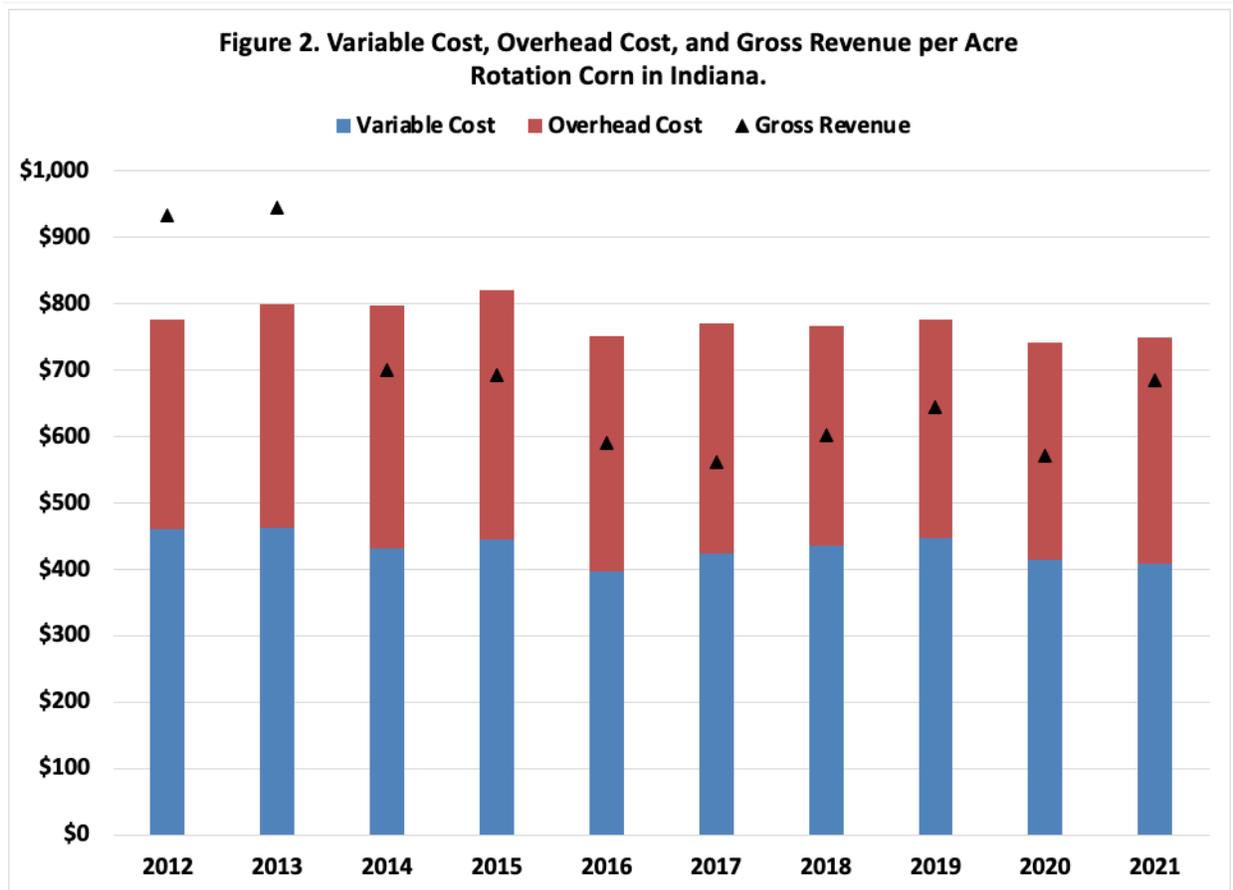


Figure 1 illustrates the trends in fertilizer, seed, pesticide, and cash rent costs for rotation corn on average productivity soil from 2012 to 2021. Fertilizer cost peaked in 2013 at \$176 per acre (\$1.08 per bushel). In 2021, fertilizer cost per acre is projected to be \$111 per acre (\$0.62 per

bushel). Cash rent per acre peaked in 2014 at \$232 per acre (\$1.42 per bushel). At \$223 per acre (\$1.24 per bushel), projected cash rent is \$9 per acre lower than it was at the peak in 2014. Partially due to resistant weed problems, pesticide cost per acre in 2021 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 \$408 per acre (\$2.27 per bushel) in 2021. Fixed cost (overhead cost) per acre peaked in 2015 at \$375, and is projected to be \$342 per acre in 2020. 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. The breakeven prices in 2018 and 2019 were approximately \$4.45 and \$4.20 per bushel, respectively. The projected breakeven price for 2020 is \$4.17 per bushel. Gross revenue for rotation corn has declined from \$945 per acre in 2013 to \$684 per acre in 2021. The expected loss per acre for rotation corn in 2021 is \$66 per acre.

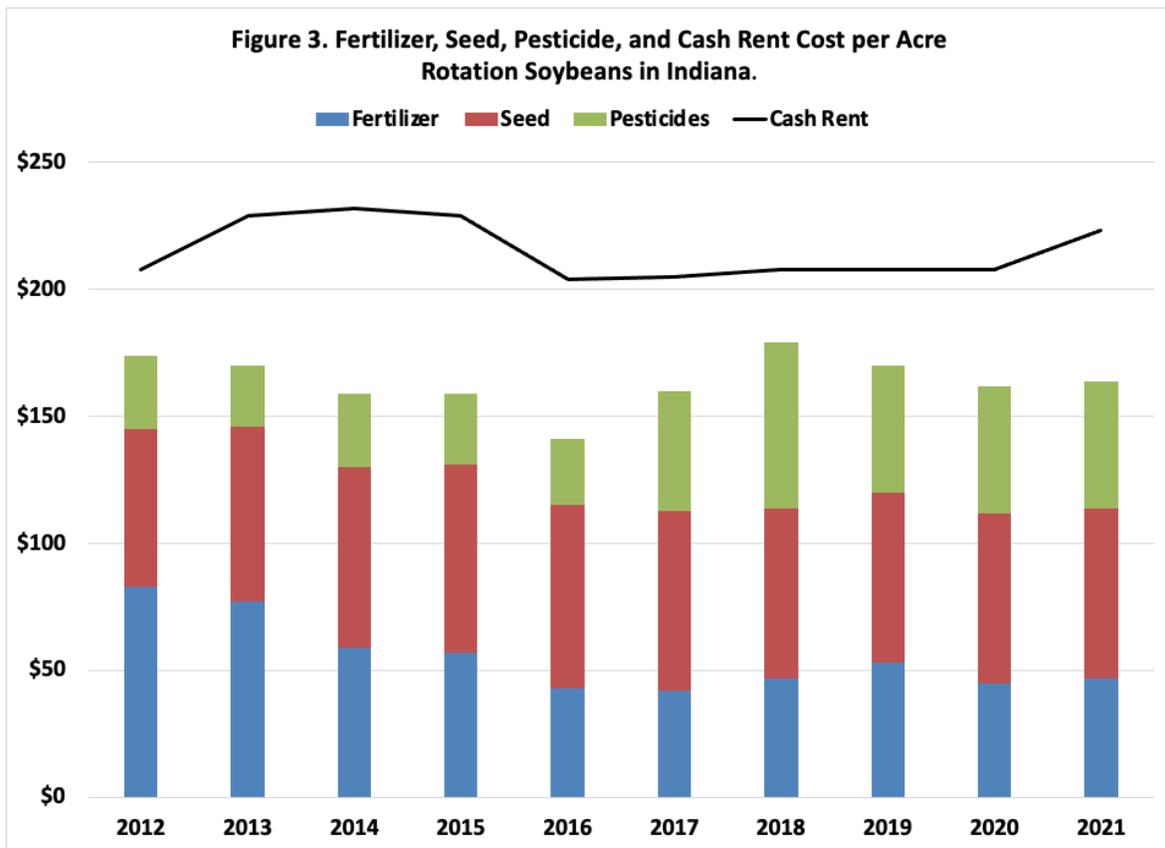
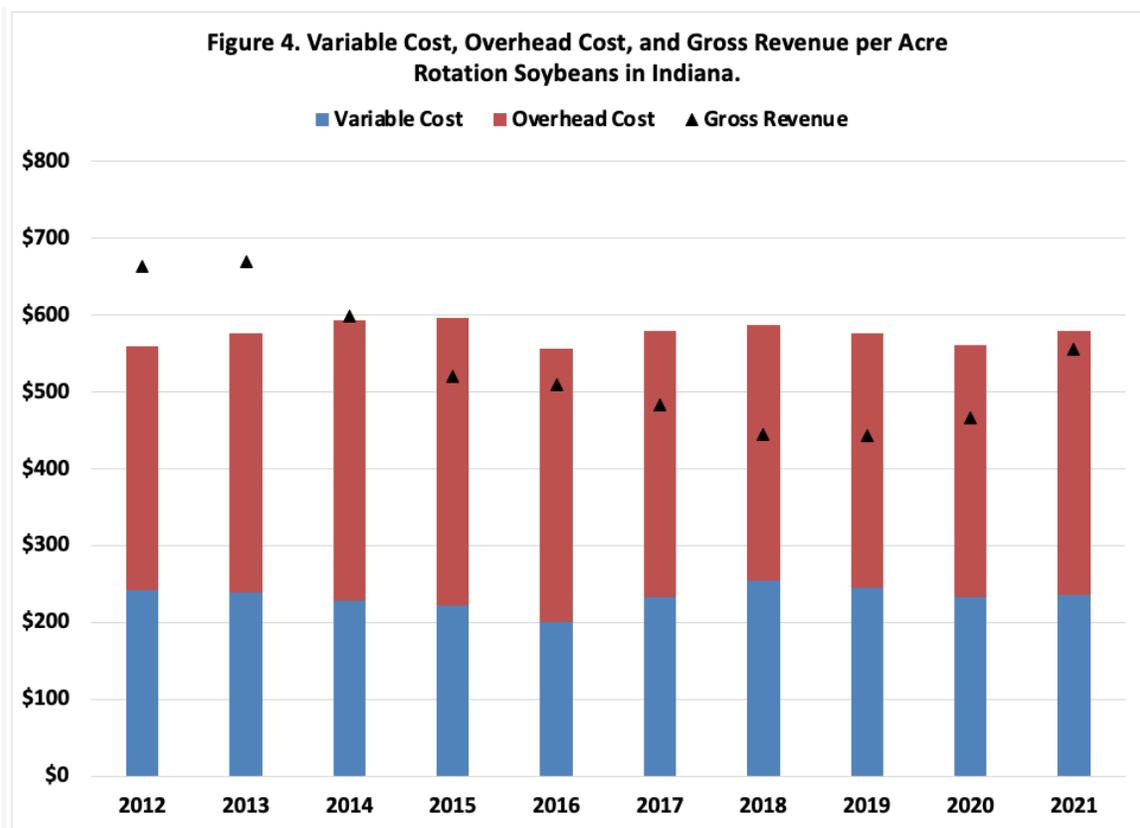


Figure 3 illustrates the trends in fertilizer, seed, pesticide, and cash rent costs for rotation soybeans from 2012 to 2021. Fertilizer cost and cash rent have declined since their peaks in 2013 and 2014. Resistant weed problems have put upward pressure on pesticide cost for rotation soybeans.



Gross revenue (market revenue plus government payments), variable cost, and overhead cost per acre for rotation soybeans on average productivity level is illustrated in Figure 4. Primarily due to higher herbicide cost, variable cost per acre in 2021 is projected to be \$237 per acre (\$4.31 per bushel), which is \$18 below the peak variable cost of \$255 in 2018. Like corn, fixed cost per acre peaked in 2015 at \$375, and is projected to be \$342 per acre in 2021. The breakeven price needed to cover variable and fixed costs declined from \$11.94 per bushel in 2015 to \$10.39 in 2020. Expected breakeven price in 2021 is \$10.55 per bushel. Gross revenue for rotation soybeans has declined from \$670 per acre in 2013 to \$556 per acre in 2021. The expected loss in 2021 for rotation soybeans is \$24 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 soybeans are expected to be \$3.80 and \$9.68 per bushel, respectively. The breakeven prices for low productivity land are expected to be \$4.56 and \$11.66 per bushel for corn and soybeans, respectively. The breakeven price for corn on high productivity soil is the same as the expected corn price, and the breakeven price for soybeans on high productivity soil is below the expected soybean price.

In summary, margins will be tight again in 2021. 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. Relatively low crop margins and expected reductions in government payments will adversely impact a farm's liquidity position and financial performance.



# PURDUE

## AGRICULTURAL ECONOMICS REPORT

Title: Providing Some Perspective on the Corn and Soybean Markets  
Author: James Mintert  
Series/Article ID: *Ag Outlook for 2021; PAER-2020-26*  
Date: December 4, 2020  
Tags: Corn, soybeans, planted acreage, China, trade, Brazil  
Summary: Dr. Mintert reviews the dramatic shifts that occurred in the corn and soybean markets in 2020 and what factors may shape the markets in 2021.

It's not unusual to have the corn and soybean outlook change during the course of the year, but the speed with which conditions changed in 2020 was indeed unusual. This past spring, as the pandemic was unfolding, concerns focused primarily on declining economic activity and the resulting spillover impacts on commodity markets. By late spring and early summer, the focus was on prospects for the combination of a rebound in planted acreage compared to 2019 and good growing conditions leading to record large, or near record large, corn and soybean crops. Combined with soft demand it looked like the U.S. would carryover large ending stocks of both corn and soybeans from the 2020 marketing year into the 2021 marketing year. But as the year progressed, it became clear that was increasingly unlikely.

To see more clearly how much the outlook changed during 2020, we can review how USDA's forecasts changed throughout the growing season. Each month USDA's *World Agricultural Outlook Board* releases an updated [World Agricultural Supply and Demand Estimates](#) report, commonly referred to as the WASDE report. The report includes crop production estimates as well as USDA's estimates for various usage categories for each crop. The key variable in each set of supply and demand forecasts is USDA's estimate of the quantity of corn and soybeans that will be carried over from the current marketing year into the subsequent marketing year, in this case from the 2020 marketing year, which ends on August 31, 2021, into the 2021 marketing year, which begins on September 1, 2021.

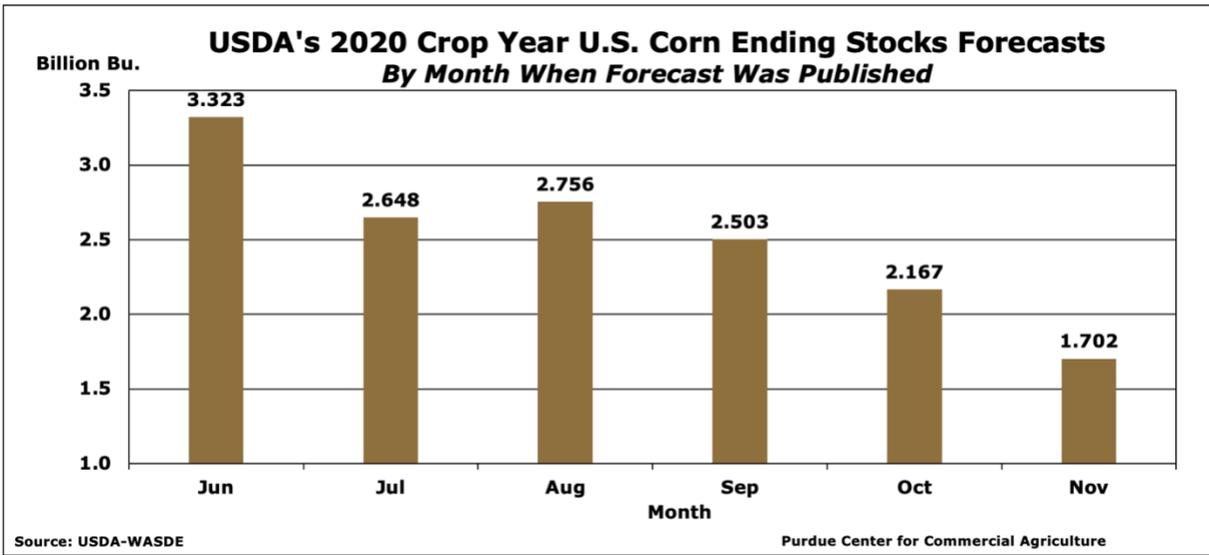


Figure 1: USDA’s 2020 Crop Year U.S. Corn Ending Stocks Forecasts, by month when forecast was published.

In mid-June, USDA’s forecast for corn to be carried over from the 2020 marketing year into the 2021 marketing year was 3.3 billion bushels which, if realized, would have been the largest corn ending stocks since the late 1980s. USDA’s forecast for 2020 marketing year ending stocks were pulled back in July and August to about 2.7 billion bushels and then began to decline sharply as we entered the fall. September’s ending stocks estimate was 2.5 billion bushels, October’s was 2.2 billion bushels and the most recent estimate available when this report went to press from the November WASDE was just 1.7 billion bushels, equivalent to approximately 11 percent of total usage. That’s a reduction in the ending stocks estimate of 49 percent from June to November! This is not intended as a criticism of the World Board’s forecasts, but rather it indicates just how much the corn outlook picture changed in a short period of time.

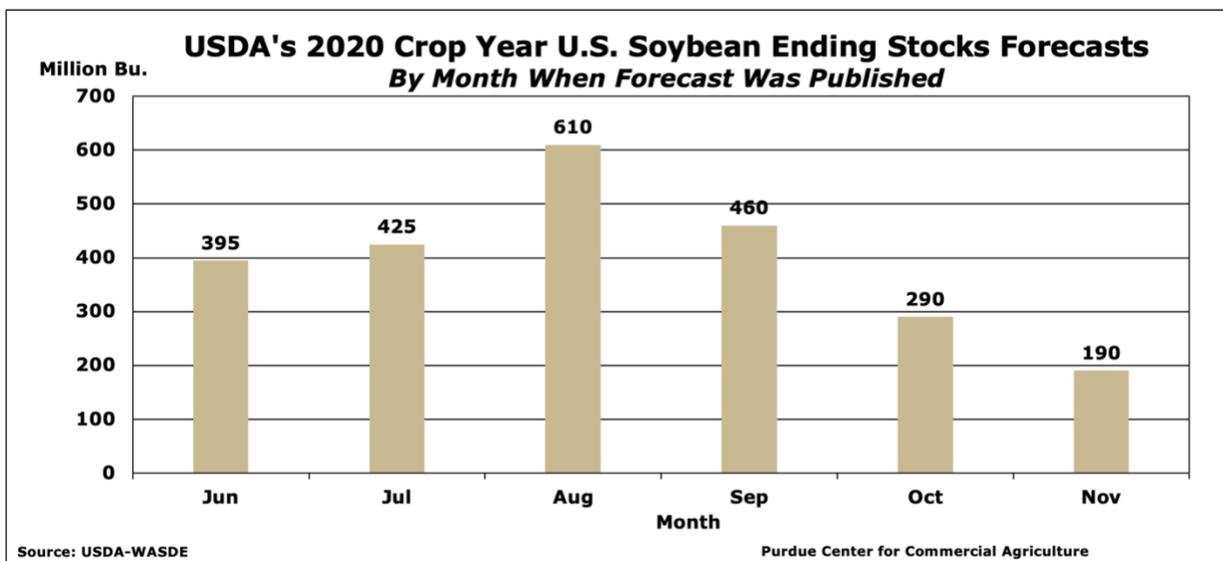


Figure 2: USDA’s 2020 Crop Year U.S. Soybean Ending Stocks Forecasts, by month when forecast was published.

An even more dramatic shift in the soybean outlook occurred this year. USDA's peak estimate of soybean carryover stocks from the 2020 marketing year into the 2021 marketing year occurred in August when they forecast ending stocks of 610 million bushels. USDA's projection of ending stocks declined 150 million bushels in September to 460 million bushels before declining again in October to 290 million bushels and the forecast issued in November was for a soybean carryover of just 190 million bushels, which is just 4 percent of total usage.

### **Underlying Causes**

What was behind the dramatic shift in ending stocks estimates? In the case of corn, it was primarily attributable to smaller estimates of 2020 corn production, combined with a reduction in the carryover from 2019 into the 2020 marketing year. In June, USDA forecast that 2020 corn production would total nearly 16 billion bushels. However, planted corn acreage turned out to be 91 million acres, instead of the 97 million acres estimate found in USDA's *Prospective Plantings* report released at the end of March and that, combined with a 3 bushel per acre reduction in the forecast national average yield from June to November, pushed the corn production estimate down by nearly 1.5 billion bushels to 14.5 billion bushels.

In the case of soybeans, it was attributable to much higher usage rates both within the 2019 crop marketing year, resulting in a smaller carryover from the 2019 marketing year into the 2020 marketing year, and from expectations of higher usage during the 2020 marketing year. The single biggest change was an expectation for stronger soybean exports, with the bulk of the soybean export increase going to China.

### **Corn and Soybean Outlook 2021**

What does all this mean for the outlook as we head into 2021? In corn, the two usage categories to keep a close eye on are exports and corn used for ethanol production. USDA is forecasting record corn exports for the 2020 marketing year, an increase of nearly 50 percent compared to 2019. Weekly export data through late November indicates that corn exports to date have actually been nearly 60 percent larger than in the year ago period with exports to China accounting for over 80 percent of the increase in exports. USDA is forecasting a modest recovery in ethanol usage that would boost corn used for ethanol by about 5 percent compared to 2019. Ethanol usage will be very sensitive to how quickly the U.S. economy recovers from the pandemic and U.S. consumers resume their old driving habits. In soybeans, the key usage category to watch is exports. USDA is forecasting a soybean export increase of over 30 percent compared to 2019. Through late November soybean exports have been 70 percent larger than in 2019 with shipments to China again accounting for over 80 percent of the export increase.

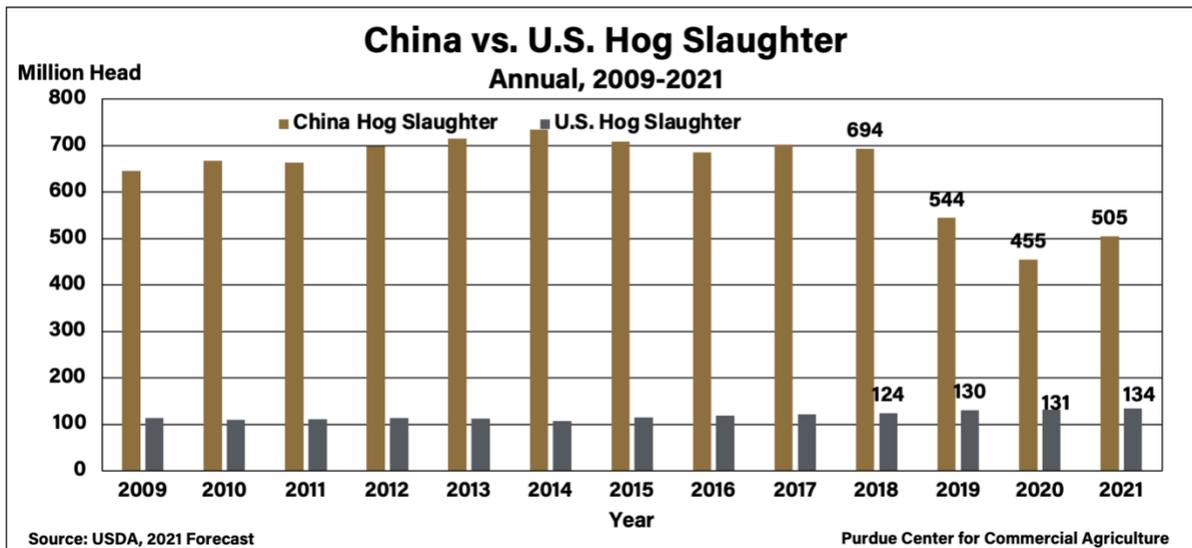


Figure 3: China versus U.S. Hog Slaughter, Annual 2009-2021

What’s driving the increase in exports to China? Setting the trade dispute issue aside, the underlying driver behind increasing demand for corn and soybeans in China is the rebuilding and restructuring of the Chinese hog sector. China is the world’s largest pork consumer and pork producer and African swine fever (ASF) decimated pork production in China. To understand the magnitude of ASF’s impact, consider that annual hog slaughter in China totaled nearly 700 million head in 2018 before ASF hit the Chinese hog herd. Hog slaughter plummeted as a result of ASF by nearly 240 million head to 455 million head in 2020. To put that in perspective, the decline in China’s hog slaughter exceeded the U.S.’s entire 2020 hog slaughter supply. China is in the midst of expanding and restructuring their hog industry and USDA forecasts that hog slaughter in 2021 will total just over 500 million head. Feed required for the hog sector’s expansion, combined with a transition towards a commercial production industry model, is what’s driving the increase in China’s imports of U.S. corn and soybeans.

The other key factor in the outlook, particularly for soybeans, will be growing conditions in South America this winter, especially in Brazil. Brazil and the U.S. are the world’s two largest soybean producers with the U.S. providing an estimated 31 percent of world soybean production in 2020 while Brazil’s share of world production, at 36 percent, was even larger making Brazil a formidable export competitor in the spring and summer. Early reports indicated that Brazil’s key growing regions were unusually dry this fall, hampering planting progress and crop development. Growing conditions during the remainder of 2020 and continuing into early 2021 will dictate the size of the South American crop and, in turn, how much competition in the export market the U.S. will face from the Southern Hemisphere.



# PURDUE

## AGRICULTURAL ECONOMICS REPORT

**Title:** The General Economic Outlook  
**Author:** Larry DeBoer  
**Series/Article ID:** *Ag Outlook for 2021; PAER-2020-27*  
**Date:** December 10, 2020  
**Tags:** Interest rates, GDP, consumer spending, fiscal policy  
**Summary:** We know the economy will recover in 2021. Everything else is uncertain. How fast will we get the pandemic under control? How fast will consumers regain their confidence? Will Congress pass another aid bill? Professor Larry DeBoer takes a leap into the unknown, with a general economic outlook.

### **The Economy Now**

The pandemic hit the United States in March, and the economy largely shut down. It began to re-open starting in May. Output partially recovered. Gross Domestic Product adjusted for inflation dropped by a record 9% on a quarterly basis in the second quarter, but grew 7.4% in the third quarter. Output is down 3.5% from the fourth quarter of 2019. For comparison, at its worst during the Great Recession, real GDP was down 4% from its previous peak.

We fell into a deep hole. We're climbing out. But we're still in the hole.

The New York Federal Reserve's weekly economic indicator shows what has happened since the end of September. It's based on ten measures that are published each week, including weekly applications for unemployment benefits, tax withholding, railroad traffic, steel production, retail sales, and others. It's indexed to estimate the change in real GDP from the year before. The index was -2.8% for the week of November 14, but that was down from -2.2% the week before.

Our rapid climb appears to be slipping. The resurgence of the virus and the expiration of many CARES Act provisions at the end of the year may stall our recovery in this quarter and the next.

### **COVID**

The course of the economy over the next year depends on the course of the pandemic. When will we get the virus under control? Economists are not experts in epidemiology—despite what you may hear!

Here's what some of the actual experts say. The Center for Disease Control expects the first vaccine supply to be available by the end of this year. Infectious disease expert Dr. Anthony Fauci expects a vaccine by early next year. Both expect wide distribution by mid-to-late summer. A Gallup poll in late October found that 58% of Americans were willing to get the vaccine when it's available, up from 34% in July. Experts writing in the *New England Journal*

*of Medicine* estimated that 60% to 70% of the population needs to be immune to bring the epidemic under control.

For this forecast, assume that the virus will be controlled by the end of the third quarter, September 2021. Which implies, unfortunately, that the virus will be out-of-control into the Spring.

## **Consumer Spending**

When consumers' incomes fall, or if they fear for their jobs, they'll keep paying the rent and buying food if they possibly can. They'll postpone purchases of cars, appliances and furniture instead, making do with what they have. During the Great Recession, 2007-2009, inflation-adjusted durable goods consumption fell 15%, non-durable goods consumption fell 4%, but services consumption actually increased slightly.

The COVID recession couldn't be more different. Compared to the fourth quarter 2019, durable goods spending was *up* 12%, non-durable goods spending was *up* 4% and it was service spending that was *down* 8%. Anxiety about "social consumption" was the reason, of course.

Retail sales expand on this story. Between February and October, online sales were up, clothing and electronics store sales were down. People avoided stores when online shopping was an alternative. Grocery store sales were up, restaurant sales were down. People worried about meals in public places. Oddly, motor vehicle sales were up, but gasoline sales were down. Many people bought cars to avoid public transportation, but many others were telecommuting, not driving. Building materials and garden equipment sales were up—people needed that new deck for their staycation.

Real GDP was \$670 billion smaller in the third quarter 2020 compared to the fourth quarter 2019.

Two-thirds of this decline was consumption spending, and *all* of that was due to services. Consumption spending is the driver of this recession. Concern about social consumption is the driver of that drop. And the virus is the driver of that concern. The economy cannot fully recover until the virus is controlled.

There's little sign of returning consumer confidence yet. The University of Michigan's Consumer Sentiment Index fell from 101 in February to 72 in April. It recovered to 82 in October, but dropped back to 77 in the November survey. The virus is surging in mid-November, and it's unlikely that confidence will rise in this environment. Confidence should ramp up as the vaccine is widely distributed this summer.

When confidence returns, will people have the resources to increase their spending? The unemployment rate has fallen a lot, but will still be higher than usual by fall. Permanent job loss will be a problem as service businesses succumb to the pandemic. About one-third of the unemployed in October had been without work for more than half-a-year. But home values and stock values are rising, interest rates and household debt payments are low, and gasoline prices are not expected to increase very much.

Savings soared to 34% of disposable income in April, by far the highest rate in at least 50 years. CARES Act payments increased incomes, but apprehensive consumers scaled back their spending. With businesses shut down there were fewer goods and services to buy. The savings rate remains high in September at 14%.

Many of the CARES Act provisions run out at the end of the year, particularly extended unemployment benefits. Consumer spending will take a hit without a new aid bill. It seems

unlikely that a bill will be passed before February, but more likely after that. It won't be as generous as the extraordinary CARES Act, but it should support spending in the spring. Spending may grow slowly until then.

There likely will be a great deal of pent-up demand among consumers by this spring, after a year without restaurants and vacations. As the vaccine rolls out and confidence rises, the accumulated savings, low interest rates, modest gas prices and added government aid should allow consumers to act. Fourth quarter consumer spending growth is likely to be high.

### **Investment Spending**

Investment spending is down just 2.9% since the fourth quarter. It was down 29% in the depths of the Great Recession. Investment has held up this time. Investment in business structures has fallen by 15%, but business equipment is down only 2%. Perhaps businesses are retooling to enable social distancing. Home construction is up 5%.

Capital goods orders have been growing since the drop-off in April, and are now higher than they were in February. Corporate bond interest rates are extremely low, financial markets seem confident, and oil prices are low but stable. Business investment should rise in 2021. With mortgage rates also very low, home prices rising and building permits above last year's peak, home construction should continue to grow too.

### **Exports and Imports**

The volume of trade fell sharply with the pandemic. Exports decreased from 11.6% of GDP to 9.2%; imports fell from 14.1% of GDP to 12%. Trade grew in the third quarter, imports more than exports, so trade was a net drag on GDP growth.

As the world brings the virus under control, the volume of trade should rise. The exchange value of the dollar has fallen, down 8% against the euro and 4% against the yuan since February. This should aid export growth and inhibit import growth. Trade policy is uncertain with the new administration, but it's unlikely that tariffs can be reduced without arduous negotiations.

### **Government and Fiscal Policy**

The CARES act was an extraordinarily quick and massive response to the COVID recession. Federal expenditures for fiscal 2020, which ended on September 30, increased by 47%, which was \$2.1 trillion. The budget deficit as a percentage of GDP rose from 4.6% to 14.9%--the largest deficit percentage since World War II. Even though private income fell at an annual rate of 12% from February to April, CARES Act benefits increased total personal income by 10%. This helped support consumer spending.

Fiscal policy in 2021 depends on the relationship between the President and Congress. Will there be instant stalemate, or will the two parties find a way to compromise? Assume that compromise is possible. There will likely be a second stimulus bill, though smaller than the CARES Act, to provide support to the unemployed and state and local governments as the economy recovers.

## Gross Domestic Product Growth

Add up consumers, business investment, government purchases and trade, and **real GDP should grow about 4.3% in 2021**. That would be the highest growth rate since 1999.

## Unemployment and Inflation

Growth that fast ought to be enough to bring down the unemployment rate substantially. After the Great Recession, the unemployment rate fell about a percentage point a year from 2010 to 2015, while annual real GDP growth averaged only 2.2%. Growth nearly double that could bring the unemployment rate down two points below the current rate of 6.9%.

That seems unlikely. The labor force is down 3.7 million people compared to February. In the second half of 2021 many of these people will rejoin the labor force. If children go back to school in August, their at-home parents will begin looking for work. Many of their former jobs will have disappeared, and their skills will have eroded, so the job search may take longer. This will keep the unemployment rate from falling as much as real GDP growth implies.

Expect the **unemployment rate to be around 5.6% by this time next year**.

The inflation rate, measured with the Consumer Price Index over the previous 12 months, fell from 2.3% in February to 0.2% in May. It was 1.2% in October. Consumer spending will rise and unemployment will fall in 2021. Oil prices are expected to be stable. Expect the **inflation rate to rebound to 1.8% during the 12-months of 2021**.

## Monetary Policy and Interest Rates

The Fed responded to the COVID recession with the most aggressive monetary expansion in its history, reducing its policy interest rate from 1.5% to near-zero in the first half of March. Financial markets had begun to panic in early March. Corporate bond interest rates spiked by March 20, but then fell quickly. By July rates were lower than at the start of the year. The Fed's quick action appears to have saved the day.

Here's the easiest forecast of all: the Federal Reserve will maintain the federal funds rate as close to zero as can be. So, **the short term Treasury bond interest rate will remain near zero**.

The 10-year Treasury bond rate is 0.9% in mid-November, down from 1.6% in mid-February, but up from 0.5% in early August. The bond rates since the recession are less than expected inflation, which means that, in real terms, lenders are paying the Treasury to hold their funds. This seems unlikely to continue as the economy recovers. Money will flow out of Treasury bonds as other investments begin to look more promising. Expect the **10-year Treasury bond interest rate to be 1.3% by the end of 2021**.

## Conclusion

The virus calls the shots. The current resurgence means we were probably in for a tough winter, with a slowdown in economic growth. If the virus is under control by the end of the summer, we'll have brisk growth with falling unemployment by the fall. What if the virus is *not* brought under control in 2021? Don't ask!