The Feed

Farmer Mac's Quarterly Perspective on Agriculture

Winter 2019 I 2020

FARMER MAC

FINANCING RURAL AMERICA

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ABOUT THE FEED

The Feed is a quarterly economic outlook for current events and market conditions within agriculture. The report is broad-based, covers multiple regions and commodities and incorporates data and analysis from numerous sources to present a mosaic of the leading industry information, with a focus on the latest information from the United States Department of Agriculture and their Economic Research Service. There are several regularly included sections like weather and major industry segments, but the authors rotate through other industries and topics as they become relevant in the seasonal agricultural cycle. Where the report adds value to readers is through its unique synthesis of these multiple sources into a single succinct report. Please enjoy.

ABOUT FARMER MAC

Farmer Mac is a vital part of the agricultural credit markets and was created to increase access to and reduce the cost of capital for the benefit of American agricultural and rural communities. As the nation's premier secondary market for agricultural credit, we provide financial solutions to a broad spectrum of the agricultural community, including agricultural lenders, agribusinesses, and other institutions that can benefit from access to flexible, low-cost financing and risk management tools. Farmer Mac's customers benefit from our low cost of funds, low overhead costs, and high operational efficiency. In fact, we are often able to provide the lowest cost of borrowing to agricultural and rural borrowers. For more than a quarter-century, Farmer Mac has been delivering the capital and commitment rural America deserves.

Contacts

To subscribe to The Feed, please visit: www.farmermac.com/thefeed

For media inquiries:
Megan Pelaez
Director – Marketing & Communications
MPelaez@farmermac.com | 202.872.5689

For business inquiries:
Patrick Kerrigan
Vice President – Business Development
PKerrigan@farmermac.com | 202.872.5560

Follow Farmer Mac:
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Follow the author:
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A MESSAGE FROM CURT COVINGTON

Happy New Year from Farmer Mac! This time of year always makes me think of one thing—two, if you count thinking of loosening my belt a notch or two after many wonderful feasts with family and friends. But mostly, I like to reflect on the year we've had and how many lives we've touched while working on fulfilling our important mission: helping to build a strong and vital rural America by increasing the availability and affordability of credit. I think back not only on the gratifying interactions we've had with our valued network of lenders, but I also think about the thousands of farmers and ranchers who are able to access affordable credit through Farmer Mac.

I'm grateful every time we get a chance to see the result of all our hard work. Last month, we invited two generations of a farming family from California to D.C. to meet and speak to our employees from across America. It's always a sweet treat to see the fruits of our labor—in this case, literally, as the family brought with them a trove of delectable oranges, lemons, and grapefruit plucked fresh from their groves.

The family had recently learned of Farmer Mac through their close relationship with a community bank in Bakersfield, Calif., which had partnered with Farmer Mac to offer the family a tailored farm real estate loan product to meet their needs. There was also a personal connection—after the deal had closed, I discovered that I knew this family well, and had taught two of the sons agricultural finance at Fresno State University. Proof that the kind of "small world," close ties that the ag finance world values so much is apparent even on a national scale and across an entire continent.

The family talked about their successes in farming and growing a large and vibrant citrus operation, but also discussed many of the day-to-day struggles that farmers have faced in the last few years: trade and tariffs, labor needs, water management; the list goes on. They emphasized the value of trusting that they can access the funding they need to carry out their plans to see their farm through trying times like these. I think the most valuable and important lesson they highlighted was the fact that farming—no matter how big or small—is still largely a family affair, and that the livelihoods of real husbands, wives, sons, and daughters depend on operations like theirs staying afloat through uncertain times.

The new year isn't just a great occasion to reflect on the past—it's a good time to look forward to the future, too. I am buoyed in the knowledge that our hard work in the name of fulfilling our mission can and does make a positive impact on the lives of farmers and ag lenders across rural America. Now, as ever, Farmer Mac is committed to supporting rural America through whatever the new year will bring.

Thank you,

Curt Covington,
EVP—Chief Credit Officer

PRODUCTION AND MARKET PRICE PERCEPTUAL MAP

Fall 2019	Winter 2019 I 2020
	ALMONDS
	CATTLE/CALVES
	CITRUS
	CORN
	COTTON
	DAIRY
	HAY
	HOGS
	SOYBEANS
	WHEAT
	WINE GRAPES

RENEWABLE ENERGY GROWTH IN RURAL AMERICA

(resource 1, 2, 3)

Key Highlights

Renewable energy generation will increase rapidly in the coming years.

Rural areas are a natural fit for renewable energy projects, given the space required for utility-scale power generation.

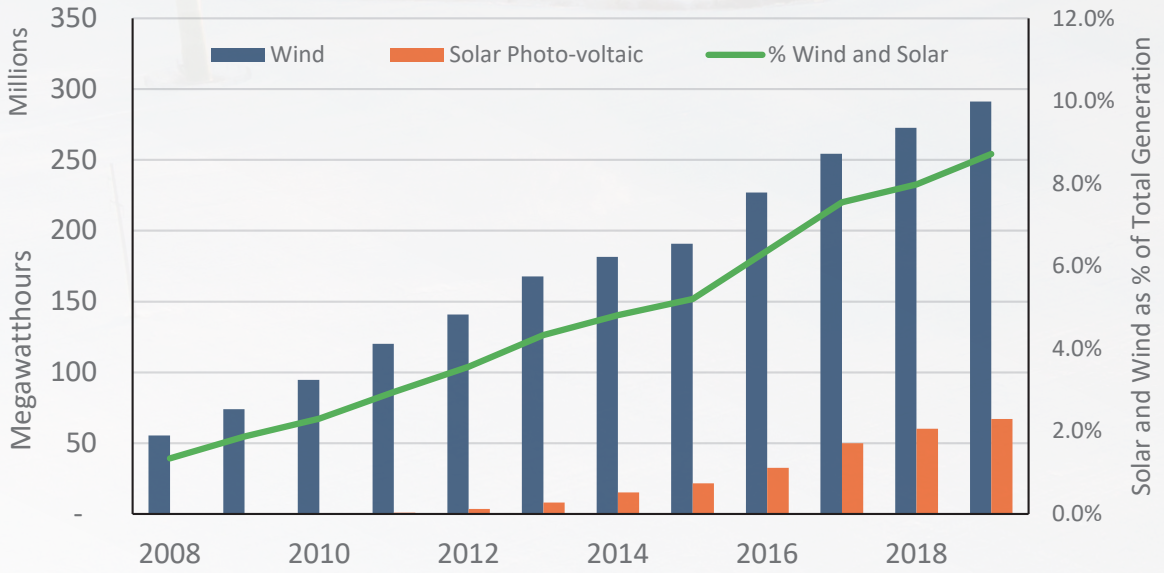
Solar and wind projects can provide substantial economic benefits to rural landowners, but owners must perform their due diligence on project developers and power off-takers.

Renewable energy is a rapidly growing segment of the U.S. power generation portfolio. Renewable power sources (including wind, solar, and hydro) have grown to comprise nearly 20% of U.S. power generation. According to data published by the U.S. Energy Information Administration (EIA), wind and solar generation in the U.S. have grown by 269% and 38,266% in the last ten years, respectively. Industry analysts and economists expect growth in the deployment of renewable power resources to continue in the coming years. Over the next ten years, the EIA expects solar energy generation to increase by nearly 200%, while wind generation is forecast to increase by 27%. While the growth rate of solar generation is greater than that of wind generation, wind generation is expected to remain the largest source of renewable generation in the U.S.

Three factors have been key drivers for the growth of wind and solar generation. First, tax credit programs have allowed the costs of renewable generation to be more competitive with other forms of power generation. However, it is worth noting that these tax credit programs, which have been in existence for over a decade, are phasing out, and without legislative action, they will expire in 2023. Second, many states have developed renewable portfolio standards. These portfolio standards typically have long lead times, as much as one or two decades. Still, their existence has pushed utilities to obtain renewable power to make progress toward the portfolio goals. Finally, as the tax credits and renewable portfolio standards accelerated the deployment of renewable generation, the costs of renewable generation equipment decreased dramatically. Lazard, a leading financial advisory firm, estimates that the unit cost of solar generation has decreased by 88% over the past ten years, while the unit cost of wind generation has decreased by 68% during the same period. As a result of these cost decreases, even after removing the tax credit benefits, Lazard reports that utility-scale renewable generation is cost-competitive with fossil fuel-based forms of generation.

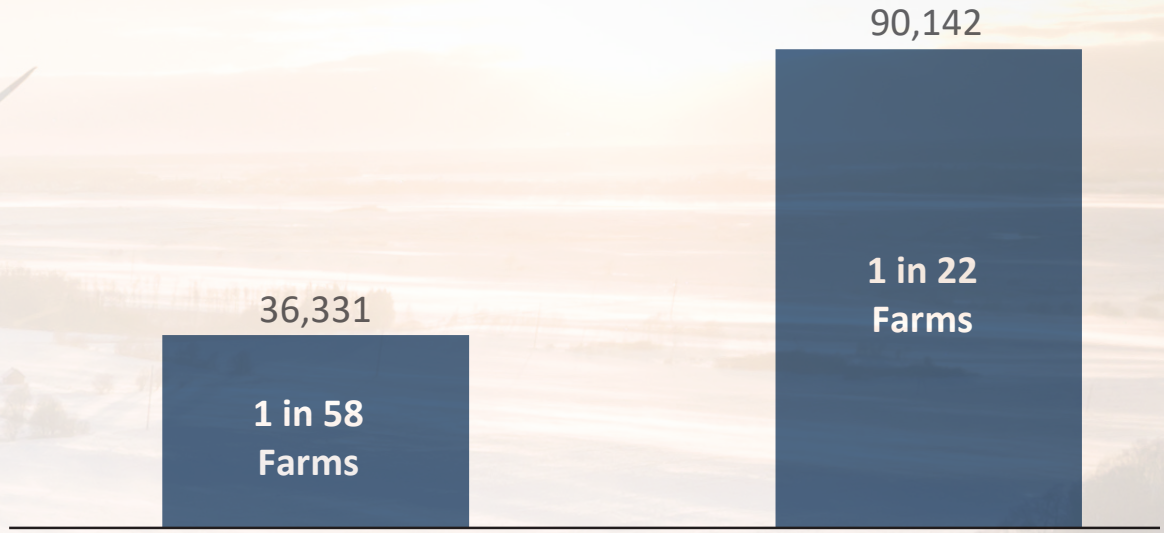
Rural America is a key area for the deployment of renewable power generation. Large-scale wind and solar generation installations require substantial land areas, and these installations can provide economic benefits to the communities that house them. Jobs are created during the construction of the power generation site, with fewer

Figure 1: Utility-Scale Wind and Solar Energy Production by Year



Source: U.S. Energy Information Administration (EIA)

Figure 2: Number of Operations Reporting Solar Panels On-Farm



Source: USDA Ag Census, 2012 and 2017

but longer-term jobs related to the ongoing maintenance and operations of the facility. The property tax base is also increased, which provides cash flow benefits to the local municipality. Finally, local landowners can benefit from leasing land to the renewable energy project. These land leases are typically long-term leases that can be as long as 30 years due to the long economic life of the renewable generation equipment. These land leases generally have inflation-linked fixed rental rates that can provide compensation greater than agricultural land rental rates, which in these uncertain times can be a beneficial source of ancillary income. According to data from the USDA's Census of Agriculture, more farmers and ranchers are installing renewable energy-producing systems on their properties, particularly solar panels. From 2012 to 2017, there was a 132% increase in renewable energy systems reported on-farm. More than 70% of that increase was due to solar panel installations (see Figure 2).

Rural landowners who are considering leasing their land for a renewable energy project should consider several important factors. First, are they comfortable with losing control of the property for as many as three decades? The landowners will still hold title to the land, but they will be ceding rights to the property in exchange for a long-term income stream that will require little to no work on the part of the landowner. Second, is the renewable project developer well-known, with a successful track record for bringing projects on-line in a timely fashion? As in all business ventures, any landholder looking to lease out land for renewable energy projects wants to be involved with a reputable partner that can execute on its obligations. Third, does the land lease contract include provisions that will require all of the renewable energy fixtures to be removed at the end of the lease term? Landowners will want their property to be returned in as similar a condition as possible to how it was before the construction of the energy project. Fourth, who is expected to off-take the power? If the renewable energy project is not able to sell its power effectively, then it is possible that the land lease payment will not be made on a timely basis. An important mitigant for this risk is that the land lease is typically one of the priority payments made by the project, even ahead of the project's equipment and construction financing costs.

SPECIALIZED COMMODITIES DURING INCOME PLATEAUS

(resource 4, 5, 6, 7, 8, 9)

Key Highlights

The United States has seen specialized commodity trends in the past, with mixed outcomes.

Production costs and consumer demand growth were key struggles for certain prior specialized commodities.

Hemp production differs significantly from these commodities but may face some of the same challenges.

Consider the following scenario: Several years into a period of flat incomes, producers are beginning to wonder how to diversify their operations. Producers are showing a rising interest in one specialized commodity that could bring in substantial profits with relatively limited capital investment. The market for the commodity isn't fully developed, but strong growth in consumer demand is anticipated. There are concerns around potential regulatory change and processing costs, but it is assumed the industry will rise to meet these challenges as it matures. The year is 1988, and many American ranchers across the south are about to begin raising ostriches.

THE RISE AND FALL OF THE AMERICAN OSTRICH INDUSTRY. Data surrounding the ostrich boom are rare, but a combination of industry estimates and contemporary studies show the volatility of the industry. In 1989, speculation for ostrich breeder pairs reached a peak after the USDA placed an embargo on South African imports due to fears related to livestock diseases transmitted by ticks. Breeders sold ostriches for upwards of $40,000 a pair due to speculation about the potential size of the U.S. market and restrictions on ostrich imports.

As ostrich production slowly increased, prices for the ratites began to fall. Processing costs remained very high, despite elevated inventories. The consumer market did not grow as quickly as anticipated, in part due to high retail prices brought on by processing costs. In late 1996, the industry saw an opening after the rise of mad cow disease in the United Kingdom, which some believed would entice consumers to eat more ostrich meat. Around the same time, the USDA eased its restrictions on ostrich imports, allowing inventories to grow considerably in a very short time. One industry member estimated that as many as 500,000 ostriches were in the United States in 1998.

Prices for ostriches, which had been falling for years, dropped considerably due to oversupply. Consumers in the United Kingdom did not switch to ostrich meat en masse, driving prices down lower. By the end of the decade, the birds were so costly relative to their value that many producers simply released their ostriches into the wild. By the time the Census of Agriculture first asked producers about ostrich production in 2002, only 20,000 birds remained on farms. Today, the American ostrich industry has stabilized into a niche market, but many of its participants believe that an initial opportunity was missed.

POTENTIAL PARALLELS TO INDUSTRIAL HEMP. Ostriches have little in common with industrial hemp, but several of the challenges facing the budding hemp industry are like what faced ostrich producers in the 1990s. Specifically, hemp sees a trio of similar challenges: navigating regulatory change, addressing processing costs, and growing consumer demand.

Regulatory change can impact hemp production in two ways. First, regulators can slow the demand growth of hemp through rulings limiting the market opportunities for cannabidiol products. The hemp industry witnessed this in November, when the U.S Food and Drug Administration issued a ruling that it could not conclude that cannabidiol products are generally recognized as safe for consumption. However, the hemp industry has several advantages over the 1990's ratite market. First, the industry has created a series of trade associations and interest groups that are more organized than earlier specialized commodities. Second, while the ostrich industry notes that they faced some competition from other animal and animal product trade groups, CBD products have fewer, less powerful detractors.

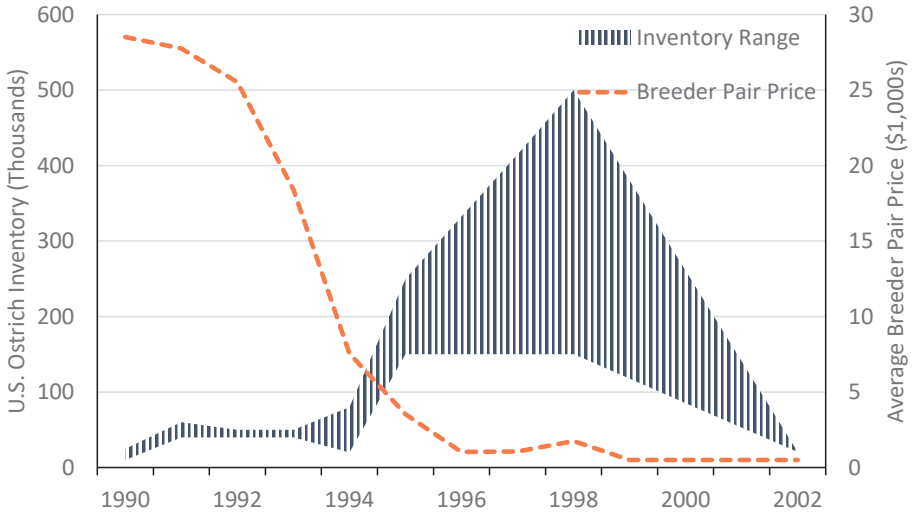
However, regulatory change can also produce challenges by allowing producers to rapidly enter a new market. The restriction on ostrich egg and bird imports in 1996 led to an almost immediate oversupply of the birds, leading to a price collapse as demand growth failed to keep up with the additional supply. Since the 2014 farm bill allowed for hemp pilot programs, harvested acres of hemp have increased from zero initially to an estimated 127 thousand acres in 2019, and over 500 thousand acres were licensed for potential production.

A second challenge that faced the ostrich industry was high processing costs that did not come down sufficiently to justify the expense for consumers. One study from the University of Wisconsin-Madison noted that hemp may face the same issue, noting that it could be less profitable than other specialty crops due to the "…current state of harvesting and processing technologies, which are quite labor-intensive." Traditional retting and fiber-separation processes are both labor- and resource-intensive, but newer solutions such as cold storage or wet baling have shown some promise in reducing costs.

Finally, producers should pay close attention to consumer demand growth. One study noted that sales of hemp-derived products in the U.S. have grown from $49 million in 2014 to $264 million in 2018, driven predominantly by growth in CBD products. Estimates of future growth anticipate sales to continue growing annually between 20% and 30% over the next several years, with a market for all hemp-derived, marijuana-derived, and pharmaceutical CBD products nearing $2 billion by 2022. This growth, if realized, would go a long way towards justifying additional U.S. hemp production.

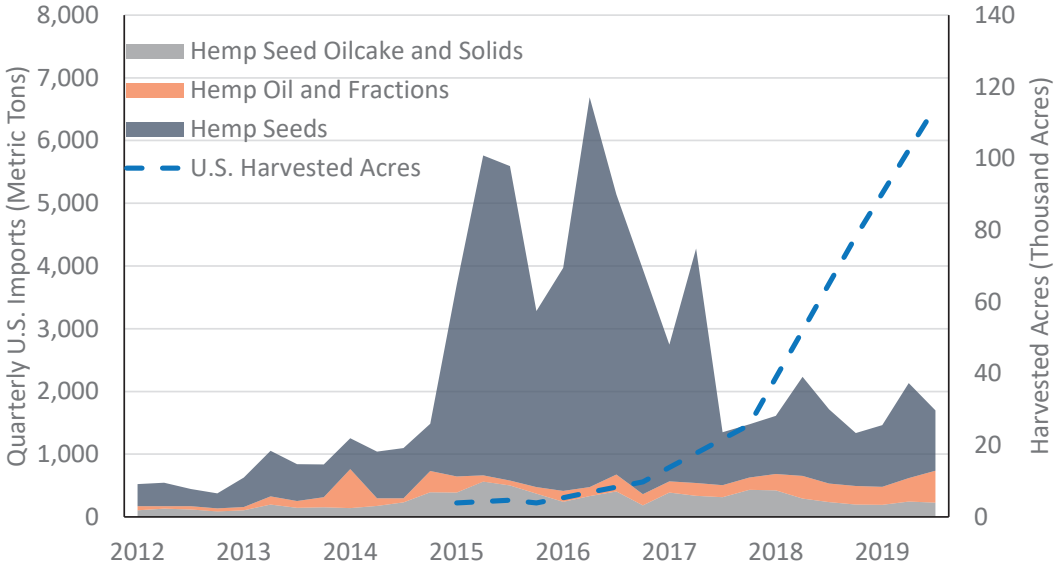
Industrial hemp may face some of the same challenges that earlier commodities have seen, but the young industry has shown that it is making strides towards addressing regulatory, processing, and consumer demand concerns. Hemp product sales may not continue the rapid growth we have seen over the last several years, but hemp production could offer producers a way to diversify their incomes during the current period of lower net farm incomes.

Figure 3: The Ostrich Boom, 1990 – 2002



Source: Gillespie & Schupp (2002), American Ostrich Association

Figure 4: Trends in U.S. Hemp Supply



Source: U.S. International Trade Commission, VoteHemp

CROPLAND CASH RENT TRENDS
(resource 10, 11, 12, 13)

Key Highlights

Cropland cash rents have stabilized relative to land values, at 3.4% nationally in 2019.

There exists considerable regional variation in rent-to-values, with nonfarm pressures coming from urbanization, mineral wealth, and recreational opportunities.

Rent-to-value ratios are generally down from 2012, with little regional variation in the trend.

In 2019, the national ratio of cropland rents to value was 3.4%. This represents the fourth year of stable rent-to-value ratios but represents a decline from the commodity price boom. Through the late 1980s, agricultural economists found that farmland values could often be derived exclusively from cash rent. By 2004, researchers were beginning to find states where nonagricultural factors were a larger influence on land values than cash rents, especially in southeastern states. More recently, a low interest rate environment has buoyed land values despite lower returns from farming.

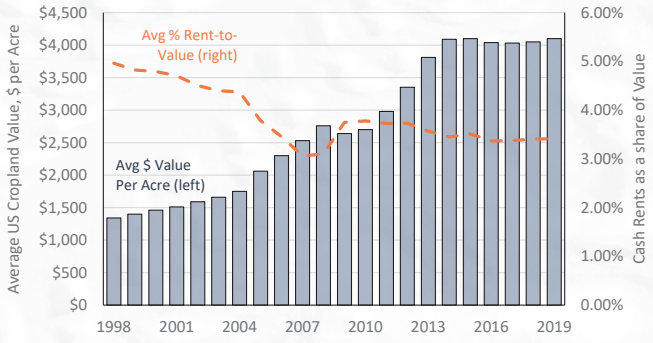
While one important nonfarm factor is urbanization pressure, other nonagricultural purposes can add value to agricultural land. Mineral-rich counties often see significant value derived from subsurface mineral rights. Nonmetro recreational counties can also see additional value from nonagricultural purposes. Even within agriculture, some land can be valued more for its water access than its productive capacity.

Using county-level data from the 2017 Census of Agriculture and the 2017 June Area Survey, many counties have rents representing less than 1% of land values. This is especially true along the east coast and southeast, where a body of literature has documented the influence of urbanization pressures. Generally, rent-to-value ratios are highest in states with the lowest land values, such as New Mexico, Montana, and Wyoming. In the Midwest and portions of the northern Great Plains, high cash rents have held up this ratio despite higher land values.

When compared against the 2012 cropland rent-to-value ratios, 60% of counties saw declines. Nationally, this was driven in part by a continued low interest rate environment that has lowered the cost of borrowing. Some declines are due in part to price changes for select commodities between 2012 and 2017, and impacts vary based on regional commodity specialization. Soybean-heavy states like Iowa saw declining cropland rent-to-value ratios in almost 90% of their counties. In many western Great Plains states, cash rents stayed relatively flat as a share of value between both periods. In counties along the eastern coast with significant poultry production, cash rents went up as a share of value.

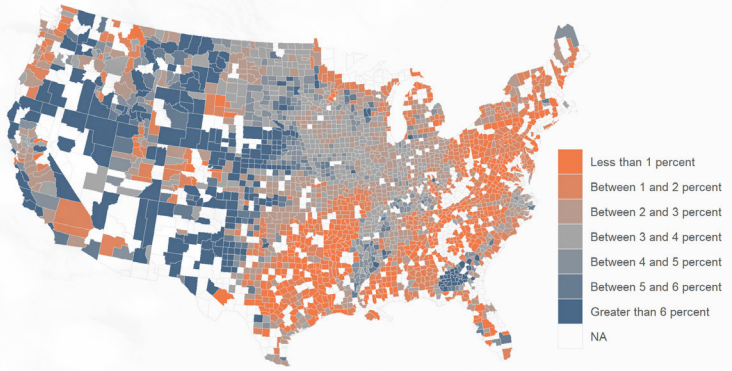
In a recent survey of producers in Iowa asking why land values remained strong, just 10% of respondents explicitly mentioned agricultural production. After interest rates, producers listed limited supply, investor demand, and government payments as important factors. Continued declines in rent-to-values could imply that these other factors are gaining importance relative to production. Production is still the most important factor for land values nationally, but outside factors have provided welcome support during the current period of lower net farm incomes.

Figure 5: National Average Cropland Cash Rents as Share of National US Cropland Value



Source: USDA NASS June Area Survey, Cash Rents Survey

Figure 6: County-level cropland rent-to-value ratios, 2017



Source: USDA NASS June Area Survey; USDA NASS Census of Agriculture

OFF-FARM INCOME AND THE URBAN-RURAL DIVIDE

(resource 14, 15, 16, 17)

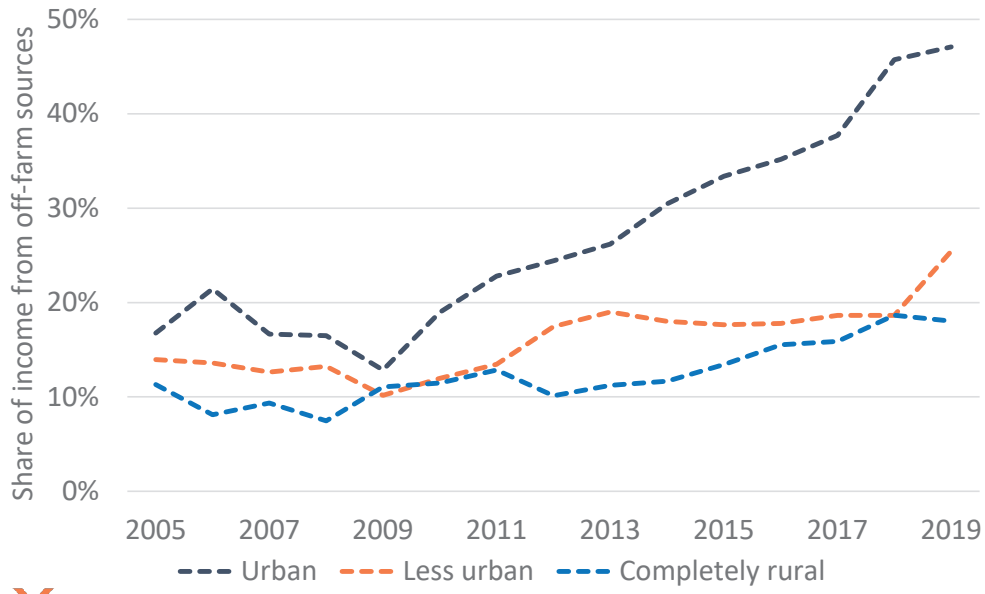
Key Highlights

Off-farm income remains an important component of total household income for farms, even among the largest producers.

Completely rural counties have seen the slowest recovery in employment and incomes following the Great Recession.

Farms in urban areas have seen more growth in their off-farm incomes since 2010 than producers in completely rural counties have.

Figure 7: Median Farmer Mac Borrower Income From Off-Farm Sources by Rural Status, 2005 - 2019



Source: Farmer Mac analysis of internal loan data

Off-farm income is an important source of income for most farms. According to the USDA's most recent Agricultural Resource Management Survey data from 2017, the median farm had a household income of $74,950, and an off-farm income of $67,500. More than 80% of all income flowing to farm households came from off-farm sources. However, many farms are retirement or residence farms, which typically make little to no income from farm sources. Even among commercial farms, or operations with gross cash farm incomes (GCFI) above $300,000, median income from off-farm sources was $39,000, or roughly 20% of total net household income.

DISPARATE IMPACTS FROM THE GREAT RECESSION

However, producers' off-farm income opportunities may be diverging. Since the last recession, employment growth in nonmetro counties has consistently lagged that of metro counties. Between 2010 and 2018, metro counties saw employment gains of over 12% and population gains above 6%. The most rural counties saw population declines of 2% and saw net employment gains of 1.5%. Labor force participation in these counties remains well below pre-recession peaks, and incomes are growing more slowly, due in part to slowdowns in the agricultural and mining sectors.

While many operations exist in these completely rural counties, a significant number of producers are in counties that are considered urban. Most counties across the eastern corn belt are considered metro counties under the rural-urban continuum code. Even in less populous states like North Dakota, urban counties exist where 90% of the county land is in farms. Farms in these counties are typically farms just outside cities that see some influence from the metro region.

PRODUCERS' OFF-FARM INCOME OPPORTUNITIES MAY VARY BY LOCATION

An analysis of Farmer Mac's portfolio found that, immediately following the Great Recession, borrowers across urban, less urban, and completely rural counties had similar shares of off-farm income relative to their GCFI. Over the next decade these groups stratified, as borrowers around metro counties saw their shares of off-farm income increase. Despite similar median GCFI, producers around metro counties saw almost double the off-farm income that their rural peers saw in 2019. Less urban producers lagged slightly but saw consistently higher off-farm incomes than completely rural producers.

While this does not prove that completely rural producers have fewer off-farm income opportunities, it does raise the question of how much geography will impact off-farm income. Farm financial data indicate that farms located close to metro areas are more dependent on off-farm income than farms in completely rural counties, but all farms see declines in their off-farm incomes during financial downturns.

MEASURING REGIONAL FINANCIAL STRESS
(resource 18, 19, 20, 21, 22)

Key Highlights

Delinquencies, a key measure of farm financial stress, have risen above short-run averages.

Regions with higher-than-average delinquencies are dependent on dairy and poultry production.

Regional strain may take several years to appear after a localized income shock.

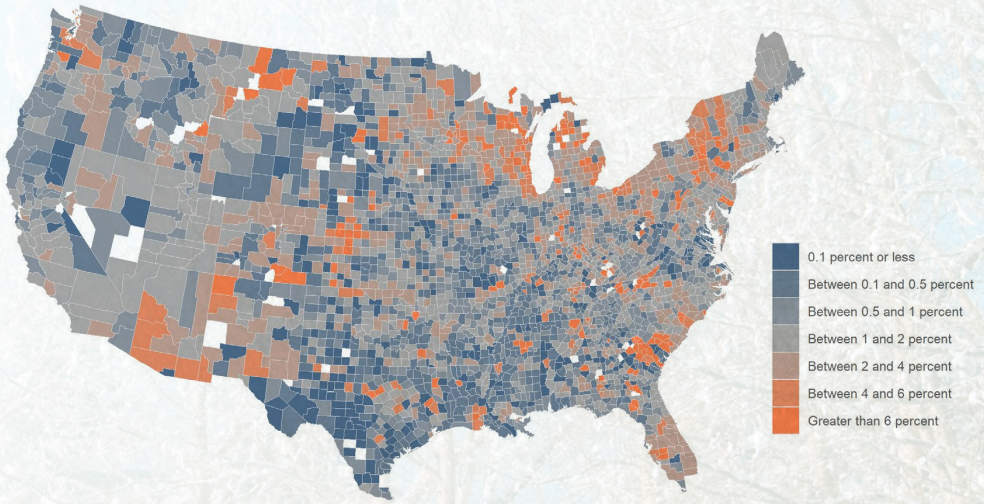
A key measure of agricultural stress is the share of delinquent loan volumes held by commercial banks. Following the high-price period of 2012 to 2014, delinquent loan shares fell to multi-decade lows before beginning a five-year ascent. The Federal Reserve's most recent estimate is that 2.32% of loans secured by farmland were delinquent in the second quarter of 2019, above the 2000 to 2018 average of 2.1%. However, farm delinquencies remain below long-run averages that account for the latter portion of the 1980s farm financial crisis as well as the 1990s.

MANY REGIONS SHOW LOW STRAIN, WHILE A FEW EXHIBIT CONSIDERABLE STRESS. While national strain has increased moderately, a different picture emerges when looking at commercial bank delinquencies by region. By allocating delinquent loan volumes to counties, using a combination of regulatory information and data from the Census of Agriculture, a picture emerges of low overall national strain, with pockets of stress. Specifically, many counties in Wisconsin, Minnesota, and New York are estimated to have at least 6% of their agricultural loan volumes delinquent.

These states all are heavily focused on dairy products and milk, with dairy sales ranging from 20% to 50% of total cash receipts. The dairy industry's struggles aren't new: dairy products saw a less prolonged price increase than many other commodities between 2012 and 2014, and prices have remained low since 2015. The regional patterns apparent in 2019 did not begin until 2017, several years after the start of the current low-price environment. One possible explanation for this gap is that producers can keep current on their debts despite lower income by relying on either working capital or equity. By the time delinquencies begin to show, operations may have exhausted other options to stay current on their debt.

Price shocks to commodities with strong regional concentration may give us insight into how delinquencies will be distributed in the future. In the case above, specific shocks to dairy and select fruit products manifests as pockets of higher delinquency. If the relationship between sustained low prices and higher delinquencies holds, entirely different regions could see strain in 2020. Moderate increases in strain nationally can mask high strain in select regions, but specific regional strain doesn't imply higher strain nationally. And five years into the current period of lower farm incomes, many regions appear to have made the adjustments necessary to keep current on their debts despite the lower price environment.

Figure 8: Share of Loans Secured by Farmland Delinquent by County, Q3 2019



Source: Farmer Mac analysis of commercial bank data from the Federal Financial Institutions Examination Council

Key Highlights

Weather in the Northern Plains is likely to remain cold and snowy for the remainder of winter.

Average precipitation is expected along the West Coast.

2019 was a year of meteorological madness that many folks with agricultural interests would like to forget. From the "pineapple express" to the "polar vortex" to a "bomb cyclone," there was something for everyone, often with impactful consequences.

Heading into 2020, conditions in the Pacific Ocean are neutral from an El Niño perspective, but there are other pools of above-normal water temperatures that may impact weather conditions in the U.S. throughout the winter. Signals of this are evident as the 2019-2020 winter has gotten off to a cold and snowy start throughout the Northern Plains. Looking ahead through the remainder of the winter, the trend should continue and expand to the East Coast through the Great Lakes states. Given the lack of a strong El Niño signal, normal amounts of precipitation are likely across the Pacific coast. However, a fast-moving and active storm track will be present, which will bring bouts of needed rain and snow across the West. Drier than normal conditions that developed during the fall in the Southern Plains are likely to persist and expand through the winter, while seasonally normal conditions are expected in the East. Expect substantial variability in the Eastern states due to the active storm track, which will often drag warmer air ahead of storms and replace it with cold conditions after the passage of the cold front.

Figure 9: Seasonal Drought Outlook

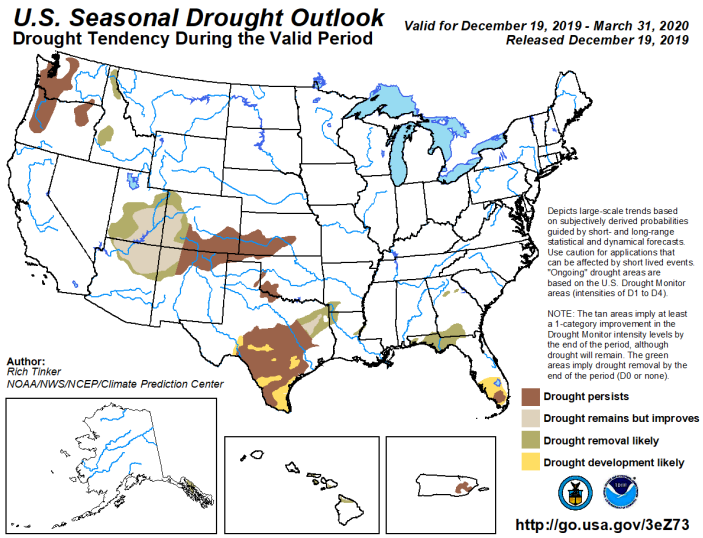
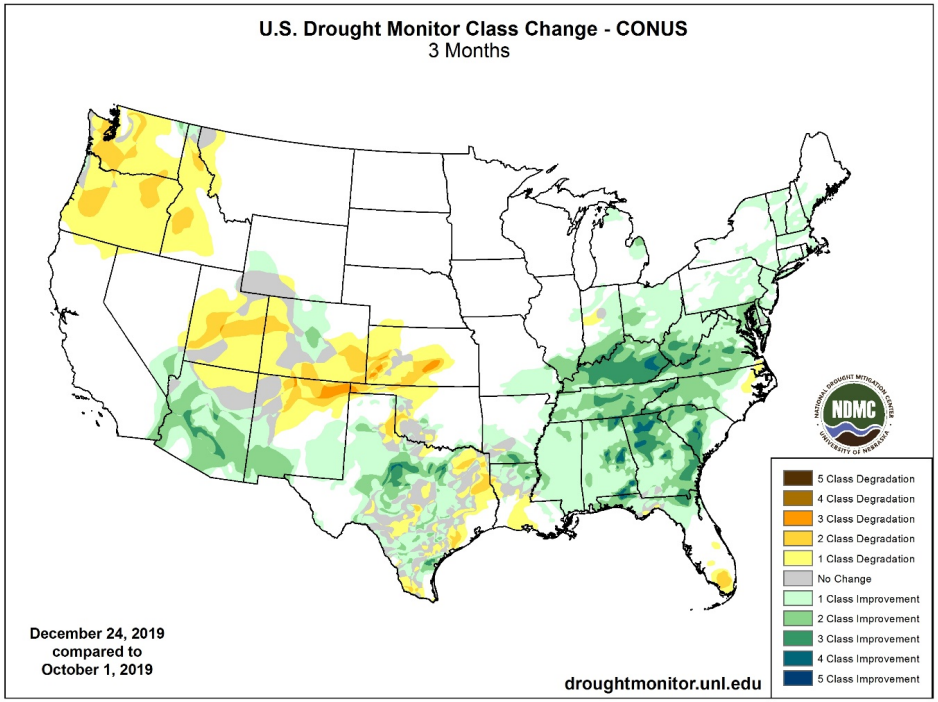


Figure 10: Drought Monitor Change



U.S.-CHINA TRADE POTENTIAL

(resource 25, 26, 27)

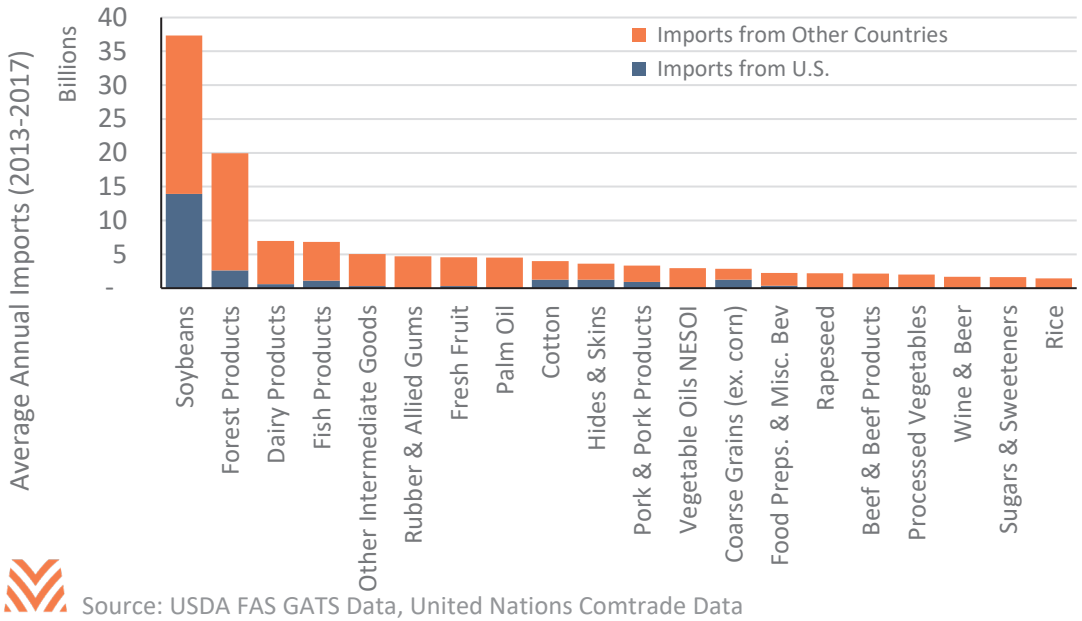
Key Highlights

China has reportedly committed to buying $40 to $50 billion in annual agricultural goods for the next two calendar years.

No two single trading partners have ever exceeded $31 billion in annual agricultural imports/exports.

To make $40 billion a reality, China will likely have to adopt a three-pronged approach: more of existing commodities, new types of commodities, and technical trade rerouting.

Figure 11: Average Annual Agricultural Imports Into China for Top 20 Commodities



Source: USDA FAS GATS Data, United Nations Comtrade Data

The U.S.-China trade dispute took a more positive tone in early December, with both sides of the negotiating table announcing a preliminary phase one trade agreement. One component of the agreement involves China buying more U.S. agricultural products in 2020 and 2021. Although neither the U.S. nor China has released the exact details of the agreement at the time of this writing, officials involved in the negotiation have been quoted as putting the U.S. agricultural sales to China at $40 to $50 billion in each of the next two calendar years. If realized, these commitments would result in a significant increase in demand for U.S. agricultural production. However, many analysts and economists have cast doubt on the ability of China to absorb that level of farm products into normal economic activity. This article puts the $40 to $50 billion claim into a historical perspective of U.S. ag exports as well as China ag imports, and it evaluates the possible paths to $40 billion in 2020.

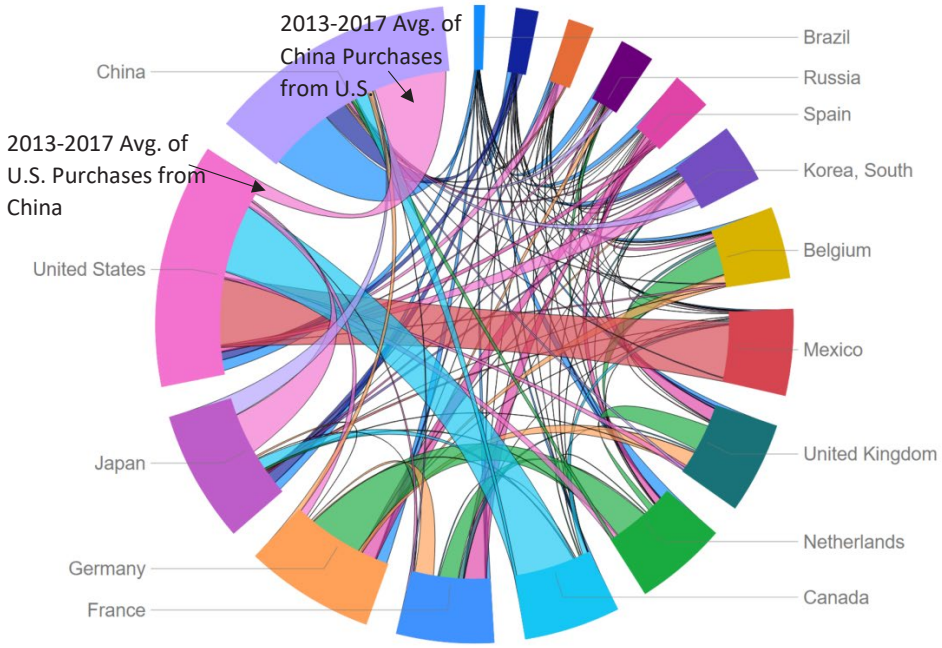
$40 billion in agricultural trade between two individual partners would be a staggering feat. The U.S. has been the world's largest food and fiber exporter since at least 1990, the first year that global ag trade data is available from the United Nations. From 2013 to 2018, the U.S. has averaged $140 billion in annual ag exports to more than 200 trading partners across the globe. The largest export destination for U.S. ag production for the last five years has alternated between Canada and China, but in no year has the top buyer of U.S. ag bought more than $31 billion in inflation-adjusted values. China is often the top importer of global agricultural goods, averaging $110 billion in annual ag imports from 2013 to 2017. China reports over 150 ag trading partners, but the top two often account for 40% or more of all their agricultural imports: the U.S. and Brazil. But neither of those parties has ever exceeded $31 billion in inflation-adjusted imports to China. In other words, no single pair of trading partners in modern trading history has ever approached $40 billion in a single-year of ag sales. Between 2012 and 2017, the U.S. averaged only $22.7 billion per year in annual agricultural and agriculturally-related sales to China, leaving a wide gap to the goal of $40 billion.

Although the proposed target sticks out compared to historical trends, there are a few potential paths to making the goal a reality. Figure 11 highlights the top 20 agricultural imports into China from 2012 to 2017, broken down by the U.S. share of the Chinese market. Importers bring in hundreds of individual food, fiber, and fuel commodities into China each year, but soybeans and forest products dominate the value of ag imports. Brazil has become the top soybean trade partner for Chinese importers, topping the U.S. share by more than $5 billion in sales annually. China's recent approval of genetically modified soybean purchases and a lowering of retaliatory

tariffs might be enough to flip that relationship and put U.S. sales up by as much as $5 billion. The U.S. ranks second in forest product sales to China, behind Russia. There is some overlap in Chinese lumber needs and the type of lumber exported by the U.S., particularly in ponderosa pine logs and coniferous lumber. There is also some additional Chinese market share potential for U.S. proteins, including dairy, beef, poultry, and pork. Finally, China has an ethanol mandate for 2020, and the ethanol industry in China has yet to mature. Without tariffs, the U.S. could export significantly more corn and ethanol to China in 2020 and 2021 to help meet blending requirements. Conversely, there is little potential for coarse grains or cotton, as the U.S. already maintains a high market share of recent Chinese import levels.

A more subtle way to increase U.S.-China agricultural trade would involve rerouting existing trade flows through Beijing. The U.S. currently sells $4 billion in agricultural goods to Hong Kong, a special administrative region of the People's Republic of China. That $4 billion could be purchased by China and then re-exported to Hong Kong. A similar strategy could involve Taiwan, which imports $4 billion per year in U.S. agricultural products. It would be more challenging to reroute U.S. imports to Taiwan due to longstanding political tensions between Beijing and Taipei, but cross-strait relations between China and Taiwan are good enough to maintain roughly $150 billion in total trade annually. Finally, Vietnam has been importing more U.S. agricultural products in the last two years, totaling $4 billion in 2018. Combined, these three close trading partners of China import roughly $12 billion in U.S. agricultural goods each year. Rerouting trade flows would not impact demand for U.S. agricultural goods, merely the path they take to get to their final destination.

Figure 12: Top 10 Agricultural Importers and Exporters by Trade Flows



Source: USDA FAS GATS Data, United Nations Comtrade Data

International trade is a complex and intricate ecosystem. As Figure 12 shows, even amongst the top 10 global ag trading partners, the patterns of agricultural trade are interwoven across all partners. A pluck of one string will reverberate across the others. China cannot simply buy more soybeans from the U.S. without affecting the other countries from which it buys soybeans, mainly Brazil. If China is to approach $40 billion in ag purchases in 2020, it will likely come from the three sources mentioned above: slight increases in existing purchase patterns (e.g., soybeans and forest products), growth in new purchase patterns (e.g., proteins and ethanol), and technical trade rerouting through other Asian partners.

CORN AND SOYBEANS

(resource 28, 29, 30, 31, 32)

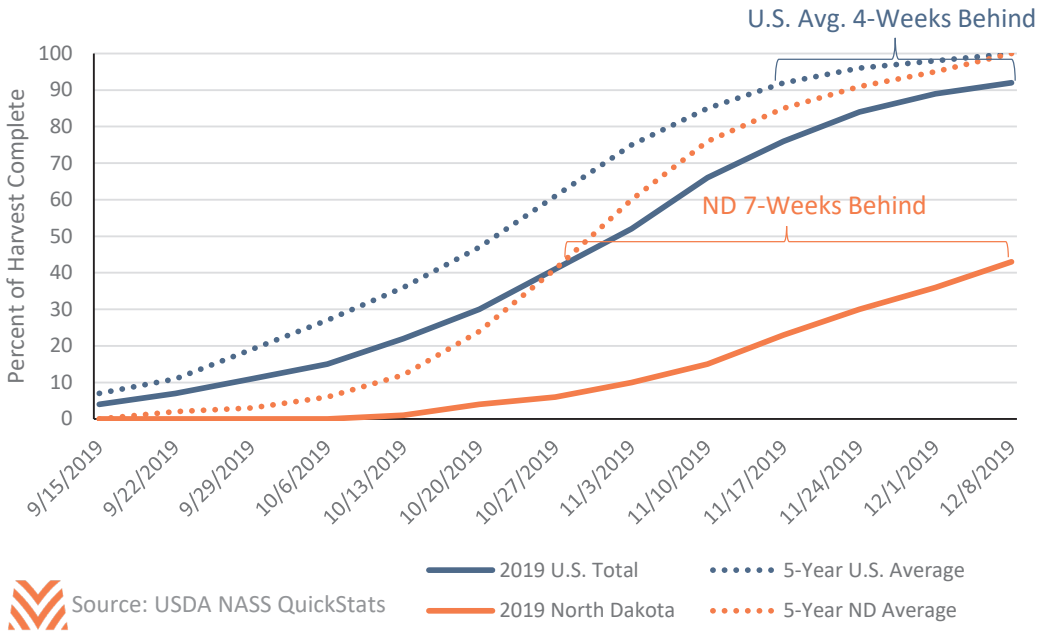
Key Highlights

Corn and soybean production are down in 2019 as a result of relatively poor growing conditions throughout the year.

Tepid grain demand in 2019 has prevented prices from rising.

Crop condition reports indicate a lower yield for both corn and soybeans compared to September estimates from the USDA.

Figure 13: Corn Harvest Progress Compared to Recent Experience

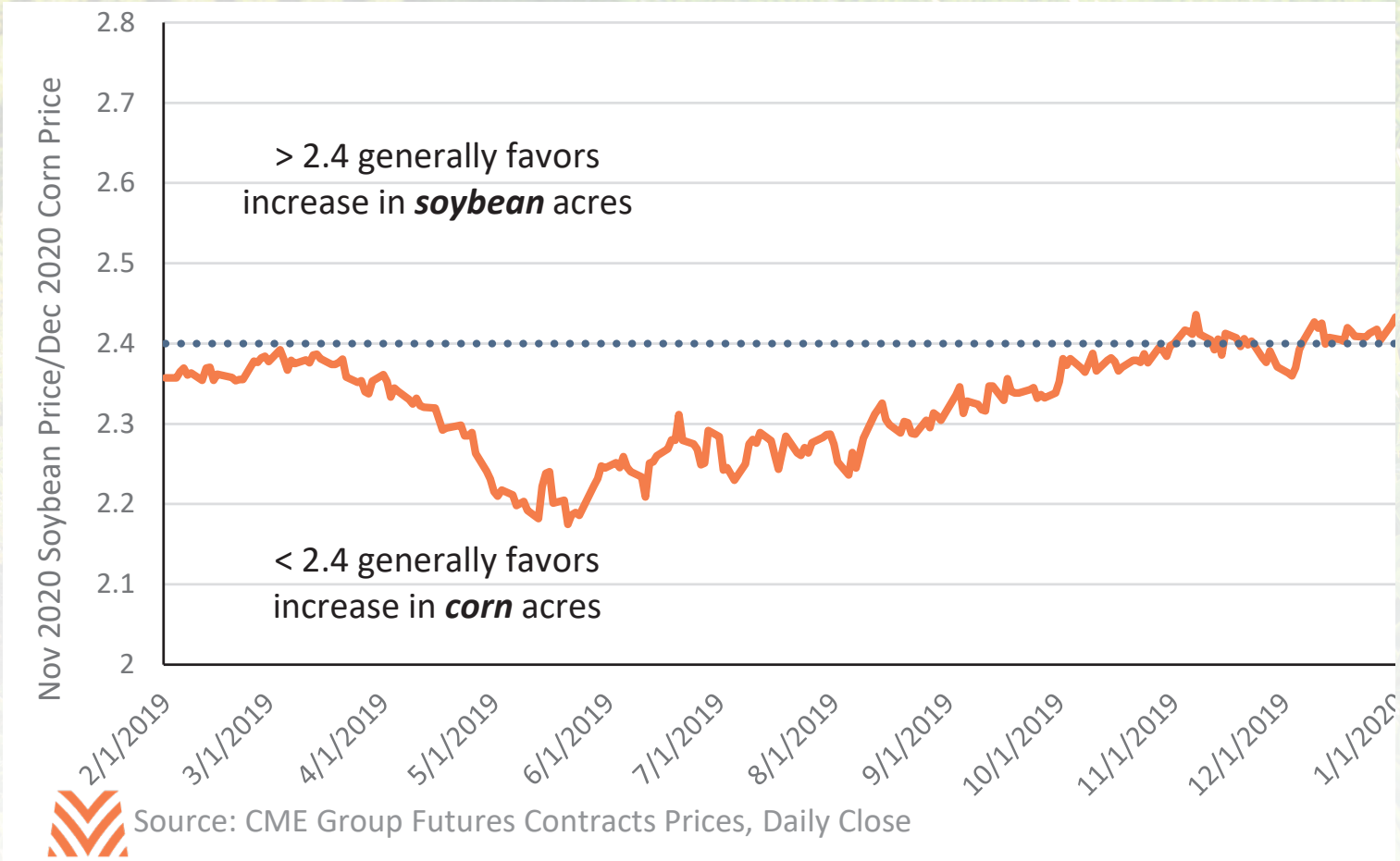


CORN. For a fourth consecutive year, the USDA projects a tightening of global corn supplies. The U.S. corn crop was beset with poor planting conditions in the spring, which led to a delayed harvest in the fall. Through December 8, growers had harvested 92% of the corn crop, compared to an average of 99% during the last five years (each of which had nearly perfect weather for corn production). The average corn acre is approximately four weeks behind recent experience. However, there are a handful of states in the upper Midwest experiencing a greater harvest extension, as winter weather has buried many unharvested acres. Growers in North Dakota are particularly affected by the harvest delays, with just over 40% of the crop harvested in the first week of December. The USDA projects an average yield of 167 bushels per acre, a 5.4% decline from 2018. Global supplies are also down in 2019/20, largely as a result of the drop in the U.S. crop. South American production was up in 2019, creating increased competition for the U.S. supply on the world stage.

Demand for U.S. corn is also down slightly in 2019. Corn use for feed is down from 2018 due to higher prices. Ethanol production was down nearly 2% in 2019 due to lower oil prices and refiner blend exemptions that compressed producer margins. Ethanol margins were so thin at times during the year that some plants were forced to cease production rather than continuing at a loss. Corn exports were also down significantly in 2019. Through October, U.S. corn exports were down 38% compared to 2018, with double-digit declines in most major export destinations. Purchases from Mexico, Japan, and South Korea are down a total of $1.7 billion in sales compared to January through October 2018. Strong crops in Argentina and Brazil have proven to be stiff competition in these top markets. However, the declines in supply have more-than offset the declines in demand, and corn prices have firmed throughout the fall and winter months. The corn stocks-to-use ratio, a measure of the ending supply to total demand, is projected to be a four-year low in 2020. This supply-demand dynamic is why the USDA projects the season-average corn price at $3.85 per bushel. Corn growers could see some upside to thawing relations with China if ethanol exports pick up in 2020.

SOYBEANS. U.S. soybean supplies are down considerably in 2020. Anticipating the persistently-low soybean prices due to ongoing trade friction with China, U.S. growers planted 13 million fewer acres of soybeans in 2019 compared to 2018. The lower acreage, combined with poor weather throughout the growing season, has lowered total soybean production by more than 20%. However, South American production set a record in 2019, and will likely break that record in 2020. Price signals in Brazil and Argentina have encouraged increased planting to soybeans, as a stronger U.S. dollar and weaker local currencies improve local prices for growers.

Figure 14: New Crop Soybean-to-Corn Price Ratio Trends



There exists considerable uncertainty around soybean demand in 2020. Domestic soybean crush has been stable in 2019, with steady demand coming from biodiesel and soybean meal for animal feed. U.S. exports remain depressed due to elevated tariffs between the U.S. and China, which includes soybeans. Not only are the prices higher due to tariffs, but total soybean demand in China is down, with fewer hogs on feed in 2019. The Chinese hog industry continues to battle the widespread outbreak of African swine fever throughout its provinces. The World Organization for Animal Health estimates that more than 200 million hogs have been culled as a result of the outbreak, roughly 40% of Chinese hog inventory. However, U.S. soybean sales to China picked up in the fourth quarter of 2019, and grain traders are bullish on the possible benefits to soybean prices if a phase one trade agreement with China is realized. In December, the USDA estimated the 2019/2020 farm price for soybeans at $8.85, but there has been considerable volatility in soybean prices, as the stocks-to-use ratio has been choppy the last two years. A trade agreement with China could bring additional planted acres in 2020, particularly if the soybean-to-corn price ratio stays above 2.4 (see Figure 14). In early January, the new crop soybean-to-corn price ratio was hovering around 2.4, which historically signaled that growers would maintain their mix of corn and soybeans in the coming marketing year.

Key Highlights

Milk production is flat across the globe, but production in the U.S. is up in several core dairy states.

The all-milk price increases have been driven by strong cheese sales, as well as a pickup in export demand.

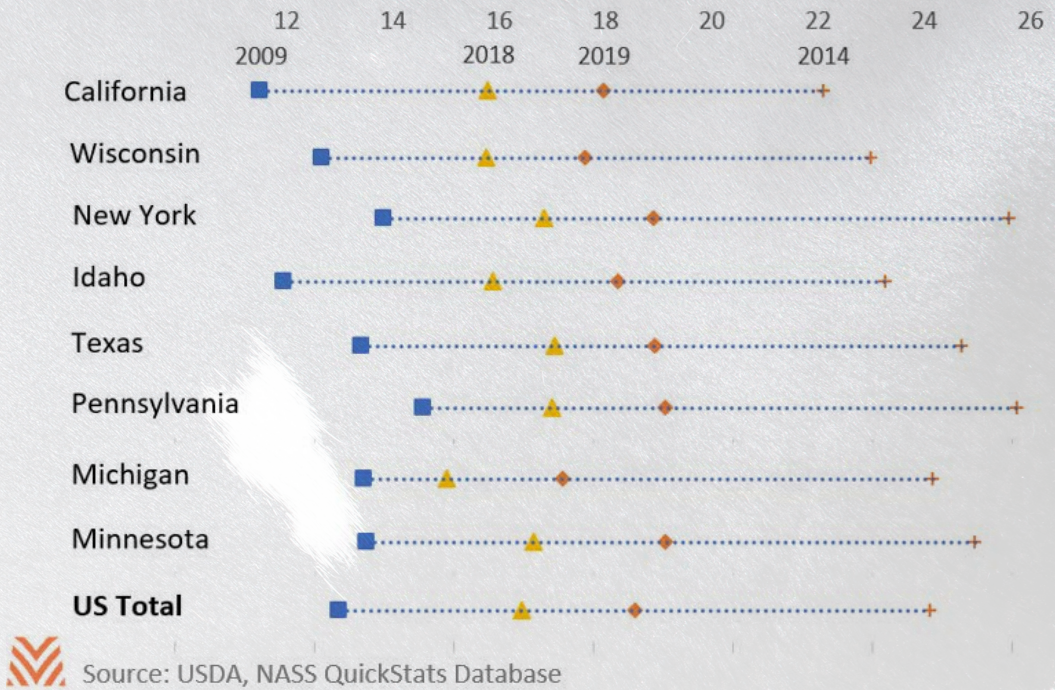
The USDA has a bullish price target for 2020 milk price, which could be threatened if global cheese prices continue to fall.

Milk production and dairy product supply were relatively flat in 2019. Through November, milk output was up less than 1% in 2019 over 2018, with lower herd numbers being offset by higher output per cow. States with the largest increases in milk production in 2019 are Texas (6.7% increase, up 795 million pounds), California (1.3% increase, up 464 million pounds), and Idaho (2.8% increase, up 388 million pounds). Pennsylvania is the state with the largest decline in milk production, with an annual decline of roughly 560 million pounds, or 5.7%, compared to 2018. After a large increase in cold storage stocks in 2018, U.S. cheese in cold storage has drawn down to its lowest levels since January 2018. However, November butter supplies were elevated compared to recent years, up 17% compared to 2018. Global production is also flat heading into 2020 due to lower production in New Zealand and Australia.

The demand landscape for U.S. dairy remains complex. Fluid milk markets remain difficult, evidenced by the bankruptcy filings of Dean Foods in November 2019 and Borden Dairy in January 2020. Dean is one of the largest raw milk processors in the country, and Borden is one of the largest and oldest. The increased competition for the declining numbers of fluid milk consumers hit both firms hard in 2017 and 2018. Fortunately, both companies have secured financing to continue processing milk during the early stages of the bankruptcy proceedings. Despite the downturn in fluid milk demand, domestic demand for cheese and whey products has been particularly strong. Export demand has also helped buoy prices, particularly in the second half of last year. The values of U.S. dairy product exports in September and October were the highest since 2013. The strong demand for butter, cheese, and non-fat dry milk products in overseas markets was instrumental in the dairy sector's rebound in 2019.

The combination of dairy product demand, improving export dynamics, and manageable feeding costs have been a much-needed relief for dairy producers. The milk price-to-feed ratio, a relative measure of producer profitability, topped 2.70 in November, a level not experienced in the industry since 2016. The USDA projects an annual average all-milk price in 2019 of $18.60 per hundredweight, an increase of $2.34 per hundredweight from 2018 levels. The USDA also expects good conditions to continue into the new year, with an early-projection of $19.40 per hundredweight in 2020. The biggest challenge to realizing the price increase will be cheese price and supply; global cheese prices have fallen rapidly in early 2020, and convergence on lower global cheese prices would put downward pressure on U.S. all-milk price.

Figure 15: U.S. All-Milk Price Ranges by State



POULTRY

(resource 36, 37, 38, 39, 40)

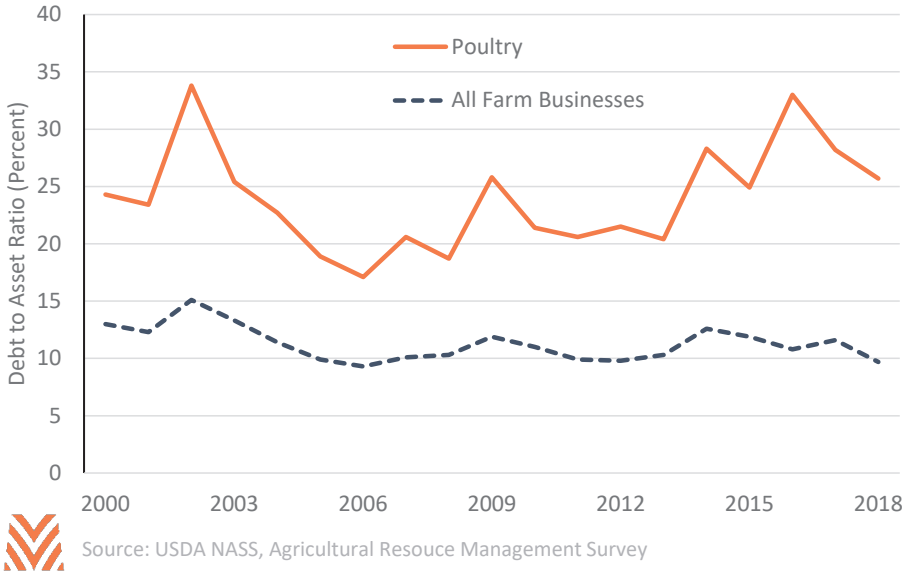
Key Highlights

The reopening of the Chinese market after five years has led to increases in broiler and egg production and prices.

These increases come as poultry producers have seen increases in financial strain that outpace the general farm economy.

Growth in demand for poultry from China can offset declines stemming from slowdowns in other emerging economies.

Figure 16: Debt-to-Asset Ratios for Farm Businesses Specialized in Poultry and All Farm Businesses



Source: USDA NASS, Agricultural Resouce Management Survey

The USDA currently projects that annual broiler production will increase by 3.2% in 2020, while egg production is forecast up 1.2%. The poultry industry has seen significant movement, as Chinese officials moved to end their ban on the importation of U.S. poultry products, which had been in place since 2014. While chicken paws are the only product deemed profitable to ship to China due to the current tariffs, other products may become profitable depending on the outcome of U.S.–Chinese trade negotiations and on poultry prices generally.

Demand growth is forecast to be strong enough to increase average annual prices despite increased production, with average annual prices for broilers and eggs forecast up 1% and 11%, respectively. This can also be attributed in part to the reopening of the Chinese market. The USDA's forecasts predict a 5% year-over-year increase in broiler exports between 2019 and 2020. Egg exports have also been revised, based on recent positive signs in exports at the end of 2019.

The timing of these increases comes at a good time for the poultry industry, which has seen some signs of strain through 2019. Prices received for broilers settled near decade lows in late 2019. Egg prices, while above recent lows, had fallen 30% from their 2018 annual average. While many commodities saw increases in measures of financial strain following the commodity supercycle, producers specializing in poultry saw faster increases in their strain. Between the end of the supercycle in 2013 and the last year when data are available, poultry producers saw their overall debt to asset ratios rise from 20% to 26%, peaking above 30% in 2016. Other measures of liquidity and efficiency for poultry producers also saw significant deterioration over this time.

The timing of the reopening of the Chinese market is especially good, as it offsets declines in growth from other emerging economies. Developing and emerging economies are forecast to represent 80% of the demand growth for protein products over the next decade. However, many of the emerging economies with the fastest growth in protein consumption have experienced economic slowdowns. Of the fastest-growing markets in South Africa, Latin America, and the Middle East, the IMF has revised 2019 GDP growth forecasts down between 0.5% and 1.2% since April 2019. The Chinese market, which will account for almost a quarter of protein consumption growth over the next decade, can more than make up for slowdowns elsewhere.

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ABOUT THE AUTHORS

Co-Creator - Jackson Takach, Chief Economist, is a Kentucky native whose strong ties to agriculture began while growing up in the small farming town of Scottsville. He has since dedicated a career to agricultural finance where he can combine his passion for rural America with his natural curiosity of the world and his strong (and perhaps unrealistic) desire to explain how we interact within it. He joined the Farmer Mac team in 2005, and has worked in the research, credit, and underwriting departments. Today, his focus at Farmer Mac currently includes quantitative analysis of credit, interest rate, and other market-based risks, as well as monitoring conditions of the agricultural economy, operational information systems analysis, and statistical programming. He holds a Bachelor's degree in economics from Centre College, a Master's degree in agricultural economics from Purdue University, and a Master's of Business Administration from Indiana University's Kelley School of Business. He has also been a CFA Charterholder since 2012.

Co-Creator - Curt Covington joined Farmer Mac in 2015 and currently serves as EVP—Chief Credit Officer where he is responsible for the company's expansive ag real estate portfolio, as well as its credit administration and underwriting functions.

Curt's extensive experience in ag lending spans over three decades and his passion for rural America developed at a young age on his family's grape and tree nut farm in Selma, California. Most recently, Curt served as the Managing Director for the Ag and Rural Banking Division at Bank of the West. He has also held various management roles within the Farm Credit System and at Rabobank. In addition to his role at Farmer Mac, Curt is a respected leader in the Agricultural Mortgage industry and is actively involved in leadership roles within industry trade groups. Curt earned his Bachelor of Arts in Finance at the University of Southern California and earned a Masters in Agribusiness from Santa Clara University.

Contributing Author - Brian Brinch joined Farmer Mac in 2000 as a Financial Research Associate. Since then, he has held various roles within the company and currently serves as Senior Vice President – Rural Infrastructure, where he is the business unit head of the company's rural infrastructure division. Brian continues to follow agricultural and rural utility industry trends and risks as he regularly contributes to the company's stress testing and strategic planning processes. Brian received both his undergraduate degree in meteorology and his master's in Agriculture and Applied Economics from Penn State University. He is a CFA Charterholder and FRM Certified.

Contributing Author - Greg Lyons is an economist who joined the Farmer Mac team in 2019. Prior to joining Farmer Mac, Greg was an economist with the USDA, Economic Research Service, where he created estimates of farm sector income and researched topics related to agricultural finance, beginning farmers and farm households. Greg's interest in rural America stems from his time growing up in upstate New York, where he spent many hours on his family's dairy farm. At Farmer Mac, he spends most of his time researching topics related to credit access, land values, and farm financial conditions. Greg has a bachelor's degree in Policy Analysis and Management from Cornell University, and a Master's of Public Policy degree from Georgetown University.

Riley Croghan, Editor-in-Chief
Betsy Urso, Copy Editor & Design

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