FARM CREDIT OF NEW MEXICO

October 2017

QUARTERLY U.S. RURAL ECONOMIC REVIEW

Unrelenting Abundance

This quarterly update is prepared by the Knowledge Exchange Division and covers the key industries served by CoBank, including the agricultural markets and the rural infrastructure industries.

Inside this Issue…

Key Points:

- The U.S. dollar has weakened roughly 10 percent from its recent high, benefiting U.S. exporters. But U.S. economic growth will be difficult to sustain beyond 2.5 percent.
- Among the issues being debated in Washington, tax reform and NAFTA renegotiations arguably pose the most significant potential opportunity and risk for rural agriculture and infrastructure businesses.
- U.S. combined corn, wheat and soybean stocks are now the largest since 1988. Such large domestic supplies and aggressive foreign expansion will make substantive price recovery difficult.
- Animal protein markets will continue to expand through 2018 and beyond, increasing U.S. dependence on export demand and the risk of a domestic glut.
- Milk prices should remain flat through the rest of the year as improvements in cheese prices are offset by weakness in butter. Milk powder and dry whey prices will remain stagnant.
- The 2017 U.S. cotton crop should be the largest in 11 years. The U.S. rice crop will be the smallest in 21 years.
- Hurricane Irma ravaged the citrus growing areas of Florida, with crop loss expected to exceed 50 percent.
- The Federal Energy Regulatory Commission will likely weigh in on the fate of PURPA in months ahead – a law widely opposed by utilities.
- Water utility capital expenditures were down 19 percent in Q1 2017. Water and wastewater spending will stall until there is more clarity around the 2018 federal budget.
- A recent poll indicates that 64 percent of rural fiber providers will cut back on investment plans for the next several years. This means most rural broadband companies must work to remain competitive and financially viable with less support.

COBANK KNOWLEDGE EXCHANGE

Global stocks of grains, oilseeds and cotton relative to usage have reached levels that will limit price gains in the likelihood that global harvests are reduced. Global demand remains strong and that should support the current level of prices in the crop sector. However, the U.S. faces significant competition. Since 2007, foreign grain production has increased by nearly 30 percent while U.S. production has only increased by 4 percent. Animal protein and dairy sectors will continue to expand and their prices will be closely linked to growth in the export market. While the weaker U.S. dollar will enhance competitiveness, ongoing trade negotiations, such as NAFTA, and trade actions will inject volatility in the year ahead. Geopolitical risks will persist and add to market uncertainty. Global growth rates are steady but the spectrum of countries contributing to that growth has broadened and that should also broaden the demand base for agricultural products. U.S. growth is likely to remain in the 2-2.5 percent range with significant quarter-to-quarter variability. This environment will continue to put pressure on farm income and debt levels.

Farmer cooperatives will benefit from larger product movement as producers seek to maintain cash flow but they will be under increasing pressure to provide inputs, productivity enhancements, speed and space and risk management options at lower costs while assuming greater inventory risk.

Global Economic Environment

While downside risks remain, the global economy is broadening out the base for growth over the next year and appears to be on sound footing. There is also room for some upside surprises if fiscal stimulus reemerges in several regions and political uncertainty is reduced. Growth rates are likely to remain near 2017 levels but a broader spectrum of countries will drive that growth. U.S. growth in the second half of 2017 may be tempered by the impacts of Hurricanes Harvey and Irma but the recovery efforts should boost growth in 2018 and may be complemented by further fiscal stimulus. Europe appears to be on an improving growth path but Brexit negotiations could turn sentiment quickly. China will likely be in transition but growth around 6 percent is

> *"Since 2007, foreign grain production has increased by nearly 30 percent while U.S. production has only increased by 4 percent.*

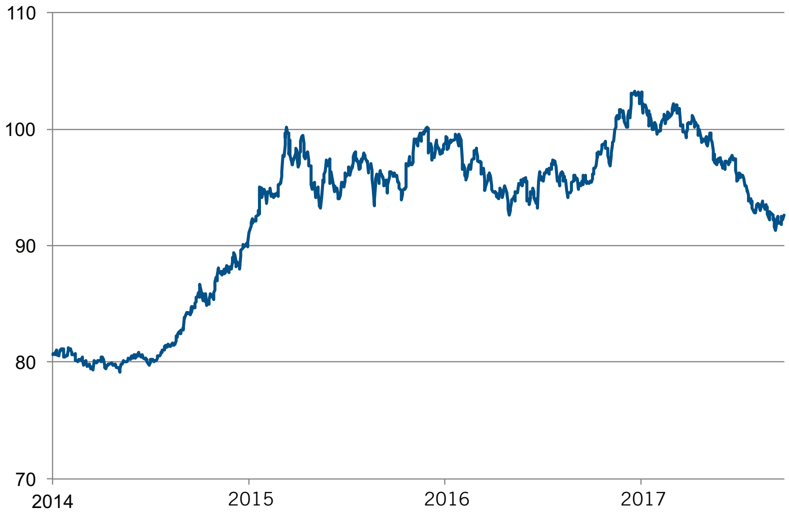
likely. Japan has the most improved outlook with positive growth for six consecutive quarters (the longest period of positive growth in over a decade). Emerging markets continue to benefit from a stronger than expected global economy and some increased optimism that the worst is behind economies such as Brazil. Canada and Mexico continue to grow steadily despite the specter of a NAFTA renegotiation and immigration issues along the Mexican border. The 8.1 magnitude earthquake in Mexico will impact Mexican growth expectations but the quake occurred 100 miles off the southern coast of Mexico and major infrastructure damage and loss of life was limited to the region near the Guatemalan border.

In this environment the central banks will be cautious in their adjustments to monetary policy. Political uncertainty is significant in many regions and the continuing trend toward nationalism and rising protectionist sentiment cannot be ignored.

Key factors include the following:

- **The outlook for Europe and Japan has improved but much of the optimism for the global economy to maintain its momentum into 2018 is linked to the ability of the Trump administration and the 115th Congress to enact meaningful fiscal stimulus in late 2017.** Tax reform, expanded infrastructure investment, reductions in regulatory burden, and shifts in immigration and trade policies are all on the table. The eventual impact is in the detail and timing of actual legislation signed into law. Many of the impacts may not occur until 2018, but 2017 will be impacted by the progress of the debate. The impacts of hurricanes Harvey and Irma will have negative effects on third quarter U.S. growth rates but should boost growth as recovery efforts get underway in the fourth quarter and beyond.

EXHIBIT 1: U.S. Dollar Index



Source: WSJ

- **China poses one of the greater uncertainties in the year ahead. The 19th National Congress in late 2017 will consolidate political control and reaffirm a commitment to address the debt overhang in the private sector and move the economy toward more reliance on internal consumption growth.** This may require a slowing in growth in the near term if they decide to delay some fiscal adjustments. However, they remain committed to doubling 2010 GDP by 2020 and that will require more fiscal stimulus over the next three years. The attempts to build global supply chains through the One Belt One Road initiative will be a centerpiece of establishing China in the global arena.

- **The U.S. Federal Reserve is leading the way for central banks to begin reducing their accommodative monetary policies over the coming year. The relative pace of change will affect financial and currency markets.** While most central banks are unlikely to reduce policy rates, the magnitude of quantitative easing is likely to stabilize and decline. After increasing rates in June, the U.S. Federal Reserve is expected to raise rates again in December. And beginning in October, the Fed will no longer fully reinvest the principal of maturing assets. Uncertainties over the large number of vacancies on the Federal Reserve Bank board and Janet Yellen's tenure as chairman will further complicate Fed actions regarding continued increases in the federal funds rate in 2018.

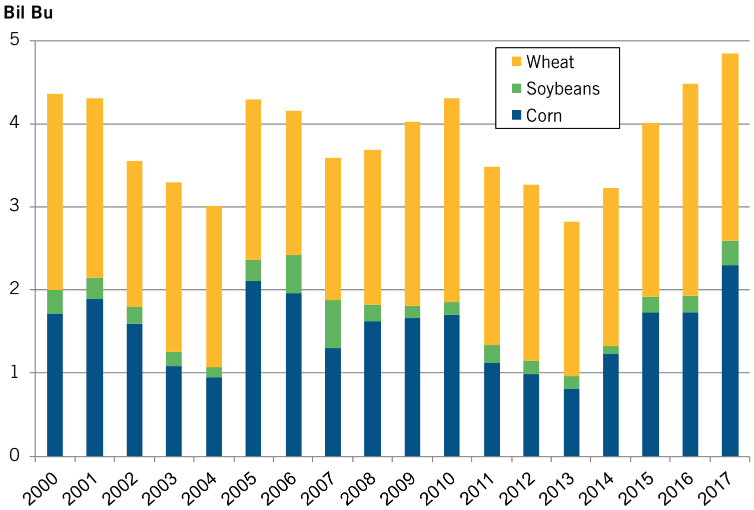
- **The value of the U.S. dollar has declined by roughly 10 percent since January 2017, trending lower as growth rates in Europe and Japan have improved.** (*See Exhibit 1.*) As central bank policies become more aligned and relative growth rates narrow we may see further but limited easing in the value of the dollar. However, the dollar still plays a safe haven role and any political or economic surprises could alter that trend.

- **Some of the political and economic concerns over the Brexit negotiations have diminished but risk will remain as the terms of the exit are negotiated.** Political support for Prime Minister May has declined and the rhetoric around the negotiations has been more tempered from both sides. There could be leadership changes in the U.K. while the leadership in Germany remains steadfastly supportive of the EU commitments. Leadership in France will face a test with labor reforms over the next few months.

- **The gradual recovery in the emerging and developing economies has gained some momentum as commodity markets have steadied and begun to grow.** If demand from the advanced economies and China remain on track we will continue to see improvement. However, capital flows to these countries will be limited as political risks remain a factor in most regions.

- **Geopolitical risks remain high with potential issues in North Korea, Syria and Venezuela in particular.** Additionally, the rising anti-globalization trend and efforts to adopt protectionist policies may fuel continued political unrest.

EXHIBIT 2: U.S. Stocks (September)



Source: USDA-NASS

The remaining political uncertainties revolve around trade actions and the ability of Congress and the administration to resolve issues on tax cuts, government spending and the debt ceiling. Renegotiation of trade agreements such as NAFTA and trade issues with China and other trading partners could impact trade flows, particularly for agriculture. On fiscal issues, an agreement to extend the current level of government spending until December 15th along with an increased debt ceiling has been reached. The question is now whether progress can be made on funding and tax cuts before the December deadline or will another political impasse arise as the holiday season approaches. The closer we come to the deadline the greater the role the 2018 Congressional elections could play.

U.S. Economic Environment

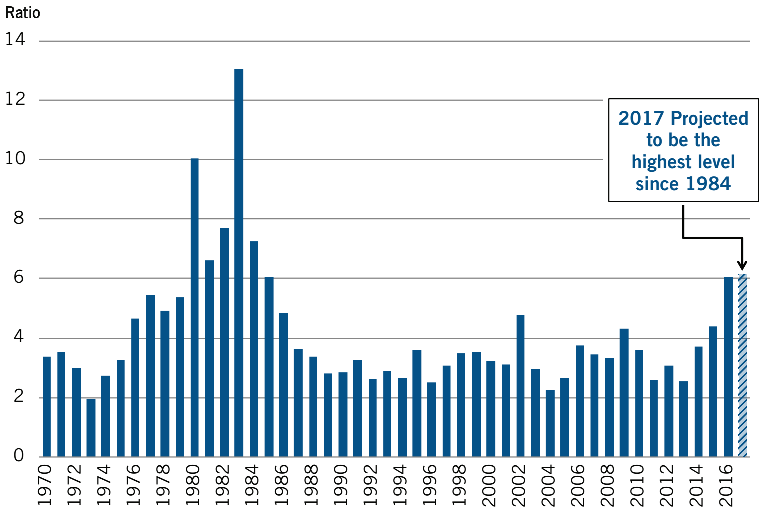
Hurricanes Harvey and Irma have altered expectations regarding U.S. economic growth in 2017 and 2018. The U.S. economy recorded a significant acceleration in the second quarter of 2017 with economic growth at a 3.0 percent annual rate. Strong consumer spending was complemented by the first significant acceleration in business investment in nearly two years. Inventories have not been adjusted significantly, so we can expect some inventory rebuilding in the second half of 2017. However, that momentum was temporarily lost with hurricanes Harvey and Irma and growth will be reduced. Texas and Florida rank second and fourth in terms of state contributions to U.S. gross domestic product and short term impacts will show up quickly. However, once the recovery process gets underway it will provide a significant boost to economic growth. Housing and infrastructure spending will expand rapidly and auto sales should move sharply higher. Florida and Texas rank number two and three in terms of U.S. autos sales. The timing of this process is uncertain. Congress has acted quickly to put in place disaster funding but much will depend on the capacity of government agencies to carry out recovery programs. While quarter-to-quarter growth rate variability will remain, the underlying growth rate for 2018 is likely to be around 2.5 percent and demand for food and agricultural products should remain steady.

U.S. AGRICULTURAL MARKETS

U.S. crop harvest forecasts point to large carryover stocks of grains, oilseeds and cotton. (*See Exhibit 2.*) Projected global stocks for soybeans, cotton and wheat remain historically high in both absolute levels and in terms of stocks relative to use. Coarse grain stocks are moving lower largely due to a drawdown of inventory in China. Shifts in acreage away from corn and wheat have contributed to the adjustments. At the same time, global export markets have remained strong and the issue will be U.S. competitiveness in supplying the marketplace. Crop prices are projected to be near 2016/17 levels, but could rise if harvests outside the U.S. disappoint. The animal protein and dairy sectors will continue to benefit from lower feed costs, a strong U.S. consumer and solid export market growth. In most protein segments prices will drift lower in 2018. The big questions for dairy and animal protein are whether the improved margin opportunities will lead to production increases that outstrip the export potential or if there is some shock to export flows.

These market conditions could make 2018 a difficult transition year for crop production agriculture. Producers will be aggressively seeking options to reduce costs and/or exploit marketing opportunities. This will also put

EXHIBIT 3: Farm Debt-to-Income Ratio



Source: USDA-ERS, CoBank ACB

pressure on farmer cooperatives to assist in that effort. With the expectation that the current commodity price environment may prevail for some time, the entire food and agriculture supply chain will be realigning business strategies. Large mergers in the seed, crop protection and fertilizer space will begin to impact distribution channels. Mergers in the food space will accelerate changes in the food processing and retail sectors. And shifts in trade policies will impact export market channels. At the farm level we could see the return of the consolidation activity that prevailed prior to the commodity super cycle that began in the mid-2000s.

Above average yields in 2016 provided producers with additional bushels to offset price declines. But that will not be the case for most producers in 2017/18. Net farm income has declined nearly 50 percent since the peak in 2013 and the ratio of income to assets is approaching the low levels experienced in the 1980s. The value of farm assets, comprised mostly of real estate, has not declined despite the drops in income, and the debt-to-asset ratio remains strong. That may begin to change as debt-to-income levels are increasing while declining cash flow pushes rental rates and land values lower. (*See Exhibit 3.*) Rising interest rates and potential tax reform changes could also play a role. There is significant variability in economic conditions across commodities and regions and the areas of greatest stress may be in the Upper Midwest and Corn Belt.

Grains, Oilseeds, and Biofuels

The recent weakness of the U.S. dollar has been a welcome tailwind for U.S. grain, oilseed and ethanol exports, but global oversupply continues to drag on commodity markets. Following record corn and soybean crops in South America and a record Russian wheat harvest, U.S. exporters are encountering increased competition.

Domestic end users, though, remain thankful for cheap and abundant grain and oilseed supplies. Ethanol producers marked a considerable improvement in crush margins this summer as corn and natural gas prices remained stable while ethanol prices rose with gasoline prices. Ethanol production in the U.S. continues at a record pace.

Grain handlers will continue to fare better than producers as abundant supplies boost storage, throughput, and basis trading opportunities.

Fall harvest is now gaining momentum in the U.S. and the market is focused on yield reports from the field. Questions have surrounded USDA's estimate of the size of the corn and soybean crops. Farmers and market advisors have pointed to drought conditions in key growing regions like Iowa and Illinois as evidence that USDA's estimates are overly optimistic. Others note that temperatures during the key month of August have been among the lowest in decades, thereby allowing crops to develop in the absence of summer heat.

Fall planting of the U.S. winter wheat crop, meanwhile, is also underway. Planting conditions across the Central and Southern Plains are largely deemed benign with ample subsoil moisture available for strong fall establishment. In the Pacific Northwest, winter wheat producers have been blessed with rains that have brought a reprieve from intense drought, but more rains are needed to make up for soil moisture deficits incurred following ongoing heat and drought conditions that plagued producers throughout the summer.

Corn

In September, the USDA surprised the trade by projecting corn yields to be the third highest on record, at 169.9 bu/ac. Many analysts project lower yields by pointing to regional dryness, especially in parts of the Central and Western Corn Belt. Additionally, crop conditions and progress consistently lag behind last year's numbers and the 5-year average.

Storage capacity appears to be ready for the upcoming crop. Areas with projected record yields in the East and South may have storage challenges compared to last year, and that would be reflected in weaker basis. Elevators will likely book solid returns to storage, with December to May carry for corn around 20-cents (4-cents/month).

Domestic demand for corn remains robust as low corn prices support expansion in the protein sector. Ethanol demand growth, however, is slowing as the industry faces headwinds domestically and on the export front.

Foreign demand has also been impressively strong. Corn exports are up 20 percent year to date (YTD) from 2015/16. Exporters have benefited from a smaller Brazilian corn crop last year, low prices and a softening dollar. Competition will increase in the fourth quarter, though, as Brazil's bumper safrinha crop works its way into international markets. Outstanding U.S. sales for the 2017/18 marketing year have dropped substantially year over year (YOY), and they are unlikely to recover to 2016/17 levels.

U.S. and world ending stocks will be lower for the 2017/18 marketing year. However, the stocks-to-use ratio remains elevated in the U.S. with forecasts of approximately 16 percent. Globally, ending stocks are projected to be the lowest since 2013/14. The decline in 2017/18 world stocks comes with a major caveat: China. China does not export or import much corn, so its inventory reduction will have little impact on the global market. The stock numbers do, however, suggest that corn supplies may be moderating from record levels, which would ultimately provide support to prices.

"Areas with projected record yields in the East and South may have storage challenges compared to last year.

Soybeans

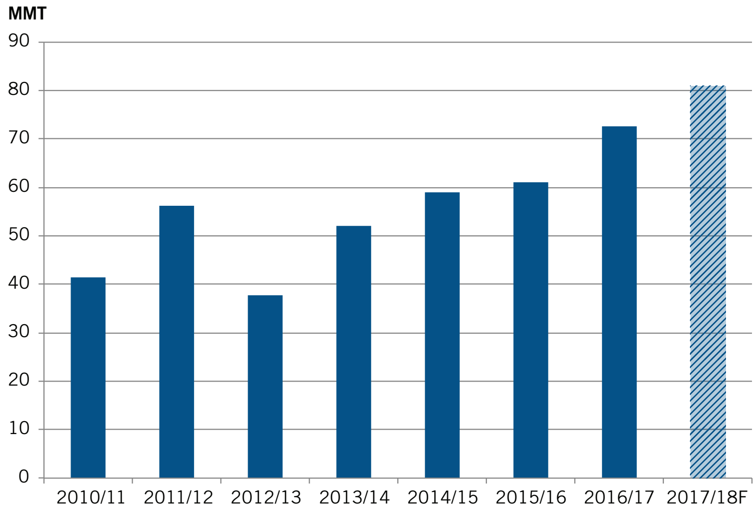
The U.S. is widely expected to harvest yet another mega soybean crop this fall based on record acreage and the second-highest yield in history. August temperatures throughout the main soybean-growing regions of the Midwest tied for the fourth lowest since the mid-1980s, giving this year's crop a reprieve from yield-taxing heat.

If USDA's soybean crop estimate is accurate, the U.S. will be tasked with exporting ample supplies following South America's exceptional harvest where yields were historically high. The question looms as to how much of the abundance China will buy.

The demand story for soybeans remains a positive one as domestic crush and exports both reach new highs. The soybean crush pace marked a new record in the final month of the crop year – a notable reversal after soybean processing weakened earlier in the year when an oversupply of DDGS (dried distillers grains) displaced demand for soybean meal. Expansions in the domestic swine and poultry sectors, alongside record biodiesel demand, will boost domestic demand through 2018. The U.S. Dept. of Commerce in August also proposed imposing duties on biodiesel imports from Indonesia and Argentina – the biggest biodiesel exporter to the U.S. – in retaliation for subsidies that it found were in violation of international trade laws. While a final decision isn't expected until 2018, the move will likely increase domestic demand for U.S. soyoil in biodiesel.

Record exports – primarily to China – have prevented a more acute inventory buildup. However, export sales for new-crop soybeans at the start of the new crop year beginning Sept. 1 were far behind last year's pace. China's recent purchases have been noticeably slower compared to year-ago commitments.

EXHIBIT 4: Russia Wheat Production



Source: USDA-NASS

Following the harvest of the U.S. soybean crop, attention will quickly turn to planting of the South American crop that has already commenced in northern Brazil. Slight acreage expansions are expected for both Argentina and Brazil, but overall production is expected to fall from this year's mega harvest that was driven by near-perfect weather and historically high crop yields. Brazilian farmers are already noting concern over dry planting conditions while Argentinian farmers are concerned about unwanted heavy rains that could delay planting.

Wheat

Fears over a steep drop in spring wheat production sent wheat values soaring this summer, only for the prices to plummet on the realization that Russia will produce another record crop this year.

Thanks to ongoing drought conditions across North Dakota and surrounding states and a significant drop in planted acreage, spring wheat production will likely fall to its lowest level in 15 years. The premium of hard red spring (HRS) in Minneapolis to hard red winter wheat (HRW) in Kansas City rallied to its highest level since 2008 on mounting fears of a shortfall of quality milling wheat. Sharply lower U.S. wheat production sent futures prices rallying to two and three-year highs.

Wheat prices are under pressure as a result of Russia. Russia's winter wheat crop this year is figured to be a whopping 81 MMTs – double the size of the crop harvested just seven years ago. (*See Exhibit 4.*) Farmers there have benefited from near-perfect growing conditions as they continue to expand crop acreage.

Russia's supply abundance, comparatively cheaper currency and close proximity to key export markets in the Middle East and North Africa have created headwinds for U.S. exports. However, recent strength in the ruble and logistical limitations at Black Sea ports have raised questions about Russia's ability to fully impose its export dominance onto the global market.

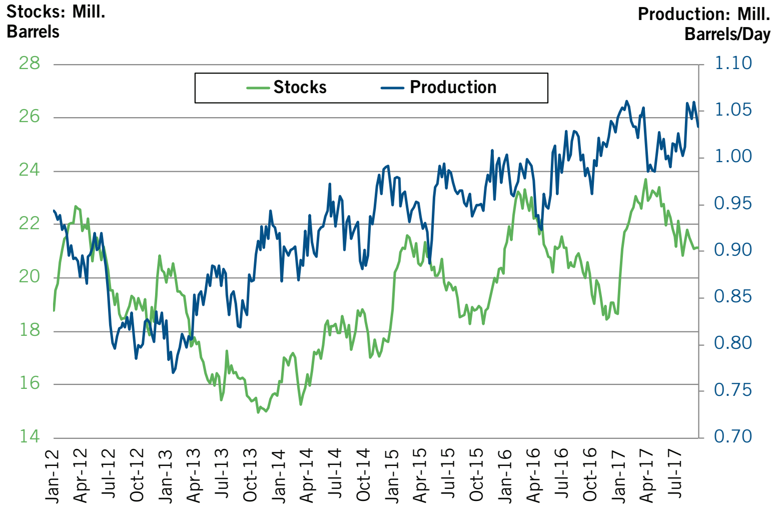
Attention now turns to the Southern Hemisphere crop. Australia is expected to harvest the smallest wheat crop in eight years on sharply lower yields resulting from ongoing drought in major growing regions and a late-season frost that is expected to have crimped yields. Production problems in Australia could translate into better U.S. exports to Asia in the final quarter of 2017 and add further strength to premiums paid for high-quality milling wheat. Argentina, though, is projected to produce another sizable crop despite excessive moisture as farmers plant more wheat acres to take advantage of reduced export tariffs.

Fall planting of the U.S. winter wheat crop is now underway in the U.S. with planted acreage expected to be down another five percent on the Plains again this year as farmers struggle to profitably grow wheat. Cash wheat prices across much of the Plains have remained at a discount to corn prices and have discouraged farmers from expanding wheat acreage. However, cash basis has been strengthening and planting conditions are ideal across much of the Central and Southern Plains. Those two factors could limit acreage reductions. In the Pacific Northwest, recent rain has improved planting conditions in the hard red winter regions of Montana and the soft white winter regions of eastern Washington, further raising prospects for winter wheat acreage.

Ethanol

Ethanol margins rebounded in the third quarter as producers benefited from rising ethanol prices and relatively steady corn and natural gas prices. Ethanol prices remain at a noticeable discount to gasoline prices, giving refiners the incentive to blend more ethanol.

EXHIBIT 5: U.S. Fuel Ethanol Production and Stocks



Source: EIA

The margin improvement has been welcome relief for ethanol producers that have struggled due to depressed DDGS and fuel prices. Weekly ethanol production surged to a record high in the quarter, which is atypical for late summer. U.S. ethanol stocks remain at record high levels. (*See Exhibit 5.*)

Hurricanes Harvey and Irma shut down nearly a dozen gasoline refineries in the Gulf of Mexico and caused business disruptions that resulted in a significant drop in fuel usage throughout the region. In an effort to stave off a fuel shortage, the EPA granted an expanded fuel waiver for 12 states in the region to allow for the sale of E15, which the federal government prohibits from June 1 to Sept. 15 across much of the U.S. While the EPA's decision to relax fuel standards was beneficial for ethanol demand, total ethanol usage is still expected to be down throughout the region from an overall drop in fuel demand.

In August, Brazil's Chamber of Foreign Trade imposed a two-year tariff-rate quota system for ethanol imports, which applies a 20 percent tariff on U.S. ethanol after a 158.5 million gallon quota is met. U.S. industry groups, including Growth Energy, the Renewable Fuels Association and the U.S. Grains Council, have demanded the U.S government respond to Brazil's tariffs, claiming over $750 million in U.S. exports are at risk. The tariff comes at a time when Brazilian ethanol producers are moving towards corn-based ethanol instead of sugar to take advantage of the massive corn stockpiles throughout Brazil.

Good news came from Vietnam, which has announced it will resume imports of U.S. DDGS. In 2016, Vietnam suspended imports of U.S. DDGS after finding quarantined pests in U.S. shipments. The Southeast Asian country had previously been the third largest importer of U.S. DDGS. While a recovery in DDGS shipments would benefit prices and producer margins, China's absence from the market will continue to weigh on prices. In September, China's government announced plans to blend ethanol into the Chinese gasoline supply by 2020. China's plan is to use E10 to improve air quality in metro areas and increase industrial demand for corn. The plan would double China's domestic ethanol production from current levels. China currently has nearly half of the world's corn inventories. Twenty percent of those stocks are estimated to have spoiled in poor storage and are now unusable for human or livestock consumption.

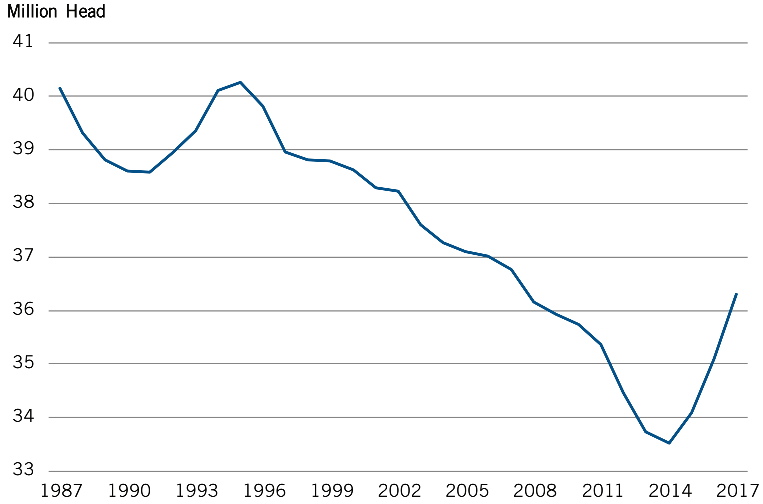
Farm Supply

The theme of supply abundance and weak prices persists in the fertilizer market as manufacturers continue to struggle with overcapacity. Nitrogen (N) fertilizers have been hit particularly hard, reflected in the summer collapse of urea prices to a 14-year low. New production capacity in the U.S. has been a boon to farmers, but the resulting oversupply has quashed plans for future expansions among manufacturers worldwide. The price of phosphorus (P) and potassium (K) fertilizers, meanwhile, held fairly stable through the summer. Seasonal price improvements are expected to improve margins in the weeks ahead as farmers make purchases for fall application.

Hurricane Harvey caused disruptions of rail movement in Texas, but no permanent damage to fertilizer production or transportation in the region has been reported. The impact of Hurricane Irma is still being assessed in Florida where two phosphate plants are located.

Difficulties with dicamba herbicide intensified throughout the summer. Lawsuits from farmers mounted over widespread crop damage caused by unintended drift from the highly volatile herbicide. According to the University

EXHIBIT 6: U.S. Annual Calf Crop, July Estimates



Source: USDA-NASS

of Missouri, more than 3.1 million acres of soybeans were damaged by dicamba drift this summer, accounting for 3.5 percent of U.S. soybean planted acreage. The EPA is now considering banning the use of dicamba during certain periods of the growing season. Earlier in the summer, Arkansas banned the use of dicamba after April 15, 2018. Monsanto, one of the manufacturers of dicamba, filed a petition in Arkansas to bring a halt to the ban, arguing that the decision was not made on scientific data and that Arkansas was the only soybean-growing state in the U.S. that did not permit the use of the low-volatility formulation of dicamba made specifically for in-season use on dicamba-resistant soybeans.

USDA recently reported that net farm income will be up in 2017, giving farmers more financial cushion for input purchases. However, the improvement was mostly due to improvements in profitability in the livestock sector. Profitability in the crop sector was projected to be unchanged from 2016.

Animal Protein

Animal protein production in the U.S. continues to steadily rise. Production growth is stabilizing and the major price adjustments of the past several years appear to be in the rear view mirror. Increasing global demand is expected to absorb much of the expansion in output while keeping per capita supply growth rates ranging from flat to moderately higher.

Total meat and poultry production is forecasted to increase a modest 2-3 percent annually in both 2017 and 2018. A rapidly growing global middle class creates tremendous opportunities for U.S. producers. However, more reliance on exports to clear the market of increased output introduces a higher level of uncertainty and increases the risk of a domestic oversupply situation.

Beef

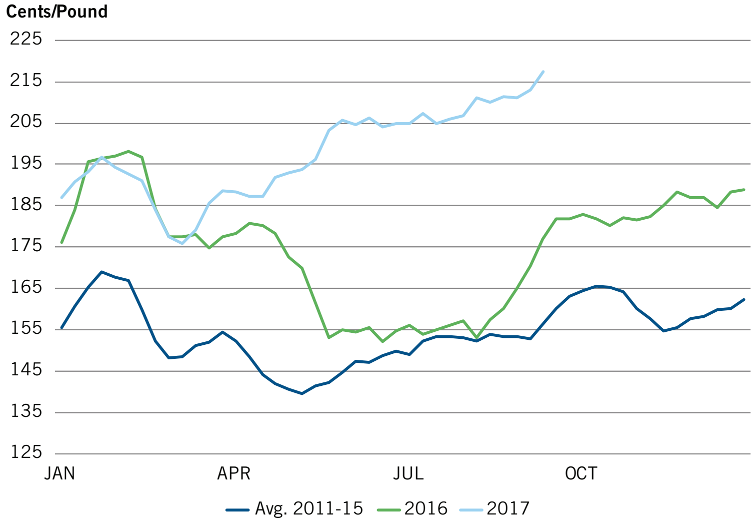
The U.S. beef cattle herd remains in expansion mode, which will result in steady increases in beef output through 2019. USDA estimates the 2017 calf crop at 36.3 million head, 2.9 percent above last year and 8.3 percent higher than the cyclical low calf crop in 2014. (*See Exhibit 6.*) Larger domestic beef production for the remainder of 2017 and throughout 2018 will likely pressure prices.

Robust demand and excellent packer profitability has led to aggressive marketings throughout 2017. Feedyard inventory currentness has dramatically improved compared to the last two years. Fed cattle slaughter numbers are up 5.8 percent YTD, while cattle weights have declined 1.6 percent, resulting in a 4.1 percent increase in YTD beef output. Beef production is on pace to increase 4 percent in 2017, and is forecast to jump another 3-5 percent in 2018.

The magnitude and duration of the current expansion phase will be determined by cow-calf profitability and pasture/range conditions. Drought conditions in the Northern Plains have slightly shifted the nation's cow herd and also accelerated the pace of placements in northern states. However, the majority of the nation's beef cows remain geographically located in areas with excellent pasture and range conditions.

The industry expects continued demand growth and steady production growth, suggesting that the major price adjustments are behind us. As a result, spreads for margin operators have returned to historical relationships, typical seasonality has returned to the market, and hedgeable profit opportunities are available. Cattle

EXHIBIT 7: Weekly Wholesale Chicken Wing Prices



Source: USDA-AMS

feeders experienced record profitability in the first half of 2017, with cash-to-cash closeouts reaching over $500 per head profit. However, fall live cattle cash prices are under pressure and crush margins are negative on placements for cattle slated to be marketed in early 2018. As output rises, cattle feeders are losing bargaining leverage to the packer.

Strong demand for yearling cattle to be placed in fall 2017 has supported feeder cattle prices. As of September, feeder cattle prices are up 10 percent YoY while fed cattle prices are down nearly 5 percent. This adds to the pressure on cattle feeding margins. However, low priced feed and improved capacity utilization will minimize the downside for cattle feeders.

Increasing supplies have also pressured the beef cutout, currently about 2 percent below last year. However, this decline is smaller in magnitude than that of live cattle prices, which has kept packers in the black. Seasonal packing capacity will tighten in the summer months of 2018, but will be sufficient. This outlook is dependent upon steady increases in Saturday slaughter and an overall increase in weekly slaughter hours. Labor availability will remain the major constraint to increasing hours.

Retail beef prices are trending sideways in 2017 and third quarter values are on par with those of 2016. Increased availability of all proteins has created more aggressive featuring of beef in a battle for market share in the meat case. The financial health of the U.S. consumer has supported product values, and in turn, retailer margins.

Roughly 87 percent of all beef produced in the U.S. is consumed domestically, but exports are chipping away at that figure. Beef exports have increased YTD by 14.5 percent and are on pace to increase 8 percent annually. The momentum will likely carry through 2018, with another 5-7 percent increase anticipated for next year.

Growth in key export destinations has been mixed of late, but Asia continues to be the bright spot for U.S. beef export growth. Sales to Japan, South Korea, and Hong Kong are up substantially. The Chinese market is now open to the U.S., but will be slow to develop. Uncertainty surrounding future trade policies with other key markets will persist well into 2018.

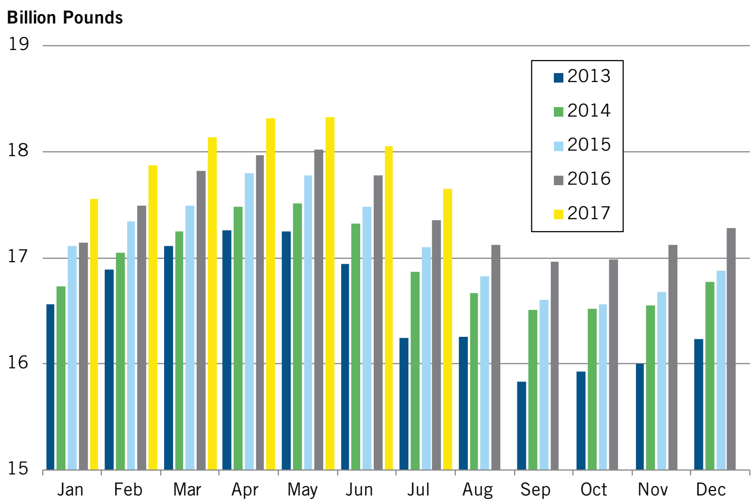
Pork

New pork processing capacity is coming online in the fall of 2017, eliminating previous concerns that processors will not be able to keep up with seasonal peaks in slaughter. YTD pork production is up 2.7 percent, while average carcass weights have declined by 0.5 percent YTD, resulting in a modest 2.2 percent increase in pork output. Pork output is on pace to increase 3 percent in 2017, and is likely to grow by another 2-4 percent in 2018.

Five new or renovated processing facilities are beginning to come on line and will be fully operational by mid-2019. In total, processing capacity will increase 8-10 percent over 2016 levels. The industry will experience a transition period as hog supplies grow and adjust to new packer demand. Throughout this transition, bargaining leverage is expected to shift in favor of the producer, and localized supply imbalances could increase price volatility.

The success of these new facilities and industry profitability will hinge on export growth. Exports currently account for 26 percent of total pork production. Any disruption in the export channels would quickly create a glut of domestic pork. A significant jump in per capita supplies would depress product values, compress packer and producer profitability, and put pressure on outdated or inefficient existing processing facilities.

EXHIBIT 8: U.S. Milk Production (adjusted to 30 day months)



Source: USDA-NASS

Pork exports YTD are up 11 percent and are on pace to increase 6 percent annually in 2017. Recent data indicate improving sales to Mexico, South Korea, and South America. New market access to Argentina should further boost opportunities for U.S. pork in the region.

China remains the focus of the global pork market. As China's domestic pork production ramps up, the robust buying behavior experienced in 2016 is cooling off. U.S. pork exports to China/Hong Kong fell by 33 percent in July and YTD volume to China is down 8 percent.

Poultry

Broiler producer profitability has exceeded expectations in 2017, bolstered by persistently low input costs, robust consumer demand and a moderate increase in output. YTD, the number of birds slaughtered is up 1 percent. Broiler production is forecast to increase 1 percent in 2017 and then remain flat in 2018.

Declining hatchability rates and an increase in antibiotic free production are limiting supply growth. At the same time consumers around the globe have been willing to pay higher prices for chicken. This combination of disciplined supply growth and strong global demand will lead to positive integrator margins well into 2018.

Wing prices have increased dramatically in 2017 and are expected to remain strong throughout 2018 and support overall broiler production profitability. (*See Exhibit 7.*)

Existing and new restaurant concepts are increasing their offerings of wings and creating sustained support for prices. Leg quarter values have also increased in 2017 as broiler export momentum continues. Leg quarter prices are up over 30 percent YoY in early September and should remain elevated through 2018.

YTD broiler exports are up 3.6 percent through July and are on pace for a 2017 increase of 3 percent. Exports are expected to increase again in 2018, by 2-3 percent.

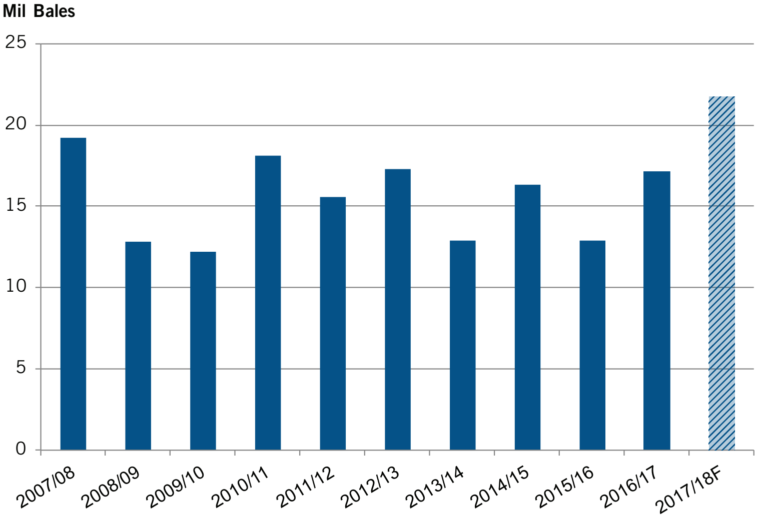
China's broiler imports have surged by 40 percent YoY in mid-2017, and are up 124 percent compared to two years ago. China banned all U.S. poultry in 2015 due to outbreaks of highly pathogenic avian influenza, including both broiler meat and breeding stock, so the increased demand is only impacting U.S. producers indirectly. China's domestic broiler production is down 11 percent due to breeding inventory constraints, and China's import demand is expected to persist, drawing down global supply and increasing the opportunity for the U.S. to fill any potential supply gaps around the world.

Dairy

Since January 2014, milk production in the U.S. has been increasing every month on a YOY basis. (*See Exhibit 8.*) This has not been the case for the EU, or any of the other major milk exporters of the world. Global markets have swung widely in response to surges and pullbacks in milk production, particularly out of the EU, which had, until 2015, been steadied by a quota system. Milk production will continue to increase, but the rate of growth may slow from the rates we have seen in the past several months.

Butter has grabbed the attention of dairy markets and continues to provide a nice boost to producer milk checks. This is typically the time of year when buyers and manufacturers start to speculate about what holiday demand might look like, and compare that to how much butter is sitting in warehouses. An inverted futures curve has discouraged manufacturers from building inventory and there have been plenty of opportunities to sell cream at high prices to other uses, rather than taking the

EXHIBIT 9: U.S. Cotton Production



Source: USDA-FAS

risk of churning it into unhedged butter inventory. Still, the market is signaling that warehouse stocks will be sufficient to meet holiday baking needs. Inventory levels are higher than 2015 but lower than 2016. Butter prices have held above the $2 mark all year and above $2.50 for most of the second half so far, but could fall through the holiday season.

Demand for cheese has been comparatively less exciting than butter. There are occasional short-term upward moves in the market, driven by a shortage of CME tradeable fresh cheese, but there is plenty of other cheese sitting in warehouses limiting broader upside potential. The U.S. market is finding some support through exports and is currently priced at a discount to the rest of the world, which should be supportive of continued international sales. As cheese production is diverted to meet export demand and fresh cheese production slows seasonally in the fourth quarter, prices could experience a slight rebound.

A side effect of the strong demand for butter and other cream-heavy products is the left over skim milk. Production is high, inventories are building and prices are stagnant for skim milk powder and nonfat dry milk. And this is not just a U.S. problem. The EU has begun buying more milk powder into public intervention stocks once again, but with government held stocks now totaling nearly 800 million pounds, no one seems to be counting anymore. It's hard to find any upside potential in the near-to-medium term for this market.

Exports have been good for the first half of the year, though the most recently released numbers for July showed a disappointing one percent decrease against last year. This should pick back up as the U.S. is competitively priced below the rest of the world. But, between ongoing NAFTA renegotiations and a passing signal of potentially backing out of a trade deal with South Korea, the markets remain unsettled.

Heading into the end of the year, inventories are large, but markets feel mostly balanced. Opportunities abound for exports, which could help lift U.S. prices to meet the higher prices in the rest of the world. But, another possible scenario is that world production ticks back up and pressures prices downward to meet those in the U.S. The most likely scenario is a combination of the two. Milk prices should remain generally flat through the rest of the year as slight improvement in cheese prices is offset by potential weakness in butter. Milk powder and dry whey will continue to stagnate in the low end of their price ranges.

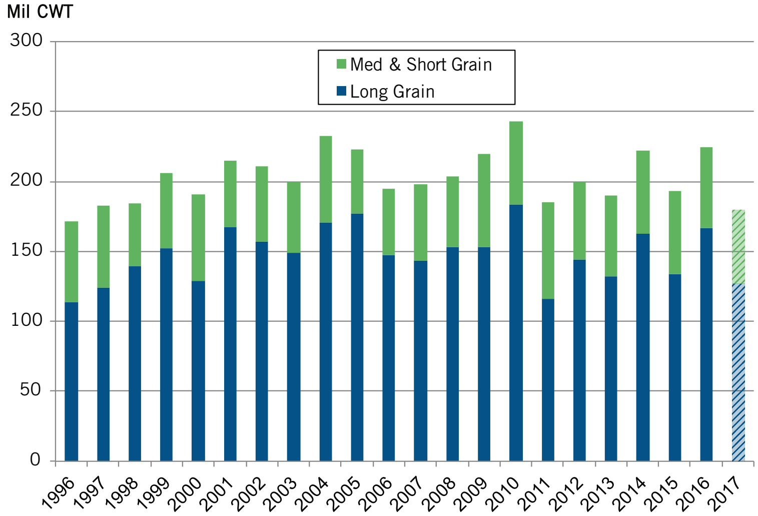
Other Crops

Cotton

Earlier this year U.S. cotton growers responded to attractive prices by planting 12.6 million acres, an 11-year high. Crop conditions were much improved this season compared to last year and the current crop is also forecast to be the largest in 11 years. (*See Exhibit 9.*) However, production forecasts now come with a significant caveat following Hurricane Harvey. The hurricane hit Texas, the largest cotton producing state, at a critical time in the harvest. Harvey's gale-force winds and heavy rains caused widespread damage in fields and at gin yards. The extent of Harvey's impact on the total cotton crop is still unclear at this stage.

U.S. mill activity remains at historically low levels and an expansion in global cotton production this season will result in increased competition for U.S. cotton shipments. World inventories are growing again despite

EXHIBIT 10: U.S. Rice Production



Source: USDA-NASS

China's ongoing efforts to reduce its stockpiles. And synthetic fiber prices are roughly half that of cotton. If Hurricane Harvey's impacts are more significant than the industry expects, price support will solidify. Otherwise, the abundance of cotton domestically and globally will weigh down prices well into 2018.

Rice

The 2017 U.S. rice crop is slated to be the smallest since 1996/97. (*See Exhibit 10.*) Plantings were off significantly YoY due to price declines and flooding during planting season. Yields are still projected at multi-year highs, but Hurricane Harvey impacts may not yet be reflected in production estimates. Although about three-quarters of Texas' rice crop was harvested by the time Harvey hit, storage bins may have suffered extensive wind and water damage, resulting in crop losses.

Prices have responded dramatically as production expectations have fallen, and ending stocks estimates declined to the lowest level since 2003/04. Nearby rice futures prices have surged from April lows at roughly $9/hundredweight to nearly $13 in September. Long-grain cash prices for the marketing year are projected to range from $12-13/cwt, up from the $9.62 average of 2016/17. Medium- and short-grain average cash prices are forecast to reach $14.70-$15.70/cwt versus last year's average of $12.80/cwt. The prospect of higher prices and a smaller crop is likely to lead to a decline in domestic and residual use in the 2017/18 season.

World rice production and inventories continue to gain even as U.S. supplies shrink. Global trade is expected to come up just short of last year's record, but U.S. exports will falter due to uncompetitive prices.

In July, the USDA reached a new agreement with China that allows the U.S. to begin exporting rice to China for the first time. China is the world's largest consumer and importer of rice, and could offer U.S. rice growers and millers significant new export opportunities over the long term.

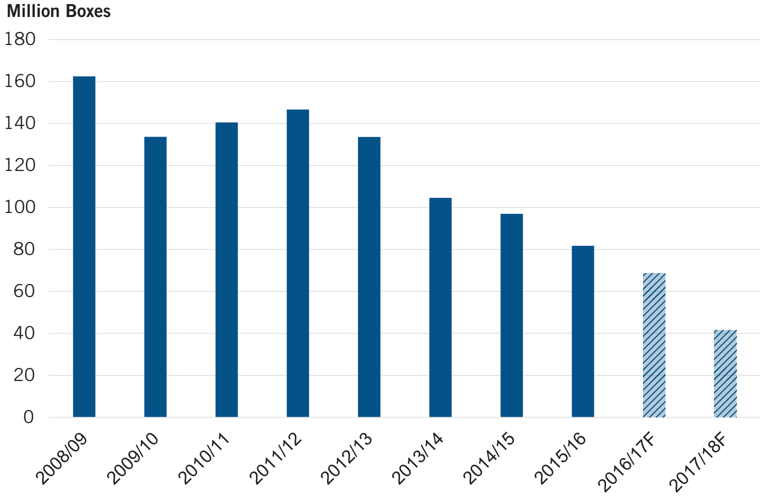
Sugar

The prospect of good sugarcane yields and record sugarbeet yields in 2017/18 will offset a decline in harvested acreage. Beginning stocks will be down about 14 percent YoY, and imports are expected to grow by about 10 percent. This will ensure that total supplies exceed that of 2016/17 and are sufficient to meet total domestic use. Raw and refined sugar prices have recovered some from the lows of 2012/13, and refined beet and cane sugar prices are expected to trade in the 30-35c/lb range in the coming year. This was the outlook before Hurricane Irma hit Florida. With a quarter of the country's sugar production impacted by Irma, the prospects for the coming season could change. The impact of the damage is still being assessed and will be better known as harvest progresses in September and October.

Following a five-year period of global sugar surplus, the world sugar balance has been in a deficit position for the last two years as production has declined. Although the anti-sugar forces don't seem to have much of an effect on sugar consumption in Asia, they will continue to impact global consumption in 2017/18. World sugar prices slumped by almost half in June from a high in October of last year. Prices have started to recover, but are not expected to move demonstrably higher given that world production is expected to reach a new high in 2017/18, prompting a return to a net surplus position.

Lastly, the recently amended suspension agreement between the U.S. and Mexico will help to restore order and certainty to the U.S. sugar market. The agreement has removed a major hurdle for the industry by excluding sugar from the ongoing NAFTA renegotiations.

EXHIBIT 11: Florida Orange Production



Sources: USDA-NASS, Florida Citrus Mutual, Elizabeth Steger, CoBank ACB
*Note: 2017/18 forecast includes prelim. estimate of damage from Hurricane Irma

Specialty Crops

Across the country, specialty crops industries are struggling with a labor shortage. Several states, including California, where the bulk of the nation's fresh produce is grown, are heavily reliant on immigrant labor to harvest fruit and vegetable crops. Some growers have been able to circumvent some of the labor issues by making use of the H-2A program, but this program is not without drawbacks – cost being one of the main ones. With labor in short supply, the market is incentivizing growers to boost worker pay and offer additional benefits, which drives up production costs. Undoubtedly, these rising costs will eventually translate into higher fruit and vegetable prices for consumers.

Given that labor issues are likely to become even more challenging going forward, mechanization and technology seem to be the only workable solutions to the problem longer term. To this end, much investment and research is going into developing robotic harvesters and equipment for performing a myriad of production tasks. Where possible, producers are mechanizing.

The renegotiation of NAFTA is another issue that is top of mind for the majority of the specialty crops industries. While some specialty crops industries have suffered from increased competition from higher Mexican fruit and vegetable imports during the off-season, the enhanced cross-border trade with both Canada and Mexico has grown the markets and revenues for a number of domestic specialty crops.

Hurricane Irma has wreaked havoc on many specialty crop industries in the Southeast – most notably Florida's citrus and Georgia's pecan crops. Many of Florida's citrus and vegetable growing areas were hit directly by the storm. Fortunately, though, most of the vegetable fields hadn't been planted yet.

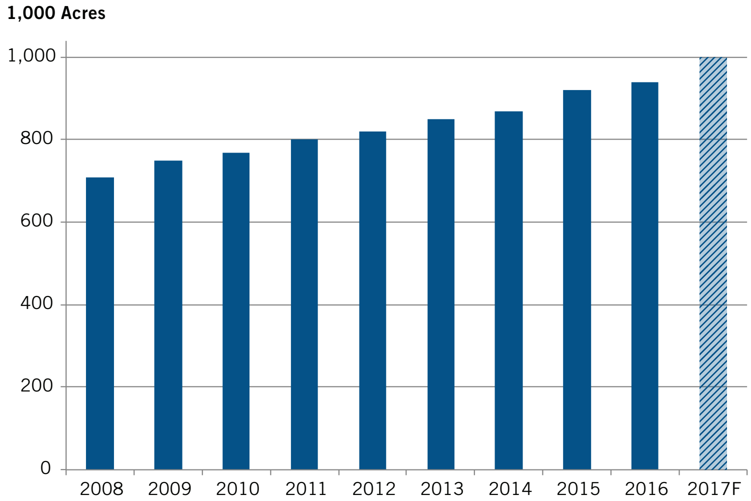
Citrus

Just as things were starting to look up for Florida's embattled citrus industry, Hurricane Irma hit. Early predictions pointed to a Florida orange crop that would be 10 percent larger than last year's crop, and the first crop increase in five years. Irma has resulted in serious, wide-spread damage across the state's citrus-growing regions with an estimated crop loss of 50 percent or higher. (*See Exhibit 11.*) The citrus areas in the southwestern and middle part of the state appear to have been hardest hit. There are reports of major tree damage and uprooted trees in these areas. More losses could surface in the coming weeks as Irma has resulted in the flooding of many groves. Citrus trees are in peril if their roots are submerged for more than three or four days.

Wine Grapes

The wine grape harvest is underway across the country, with the first grapes harvested in some regions just over a month ago. After the wet winter in California, the industry expected an average size crop of good quality. And up until the Northern California heat wave in early September, those expectations were holding. But the unusual heat caused a rush among growers there to harvest the mature and not-yet-ripe grapes to avoid yield losses due to raisining or dehydration. Although hot spells are not uncommon during the harvest period, an extreme spike in temperatures so early in the harvest can be disastrous for wine grapes. Grapes that were harvested before the heat wave look good. But the crop as a whole has significant damage due to raisining, and there is a lot of uncertainty about the size and quality of the 2017 vintage. The rush to pick grapes as speedily as possible further exacerbated the already tight labor situation and strained transportation and other resources.

EXHIBIT 12: California Almond Bearing Acreage



Source: USDA-NASS, CDFA

Tree Nuts

The 2017 walnut crop is forecast at 650,000 tons, 5 percent smaller than the 2016 crop. Although 2017 bearing acreage of 335,000 acres is larger than that of 2016, average nut set is down 19 percent from last year and the lowest on record. After five years of drought, the plentiful rain that fell over the past winter and spring and sufficient chilling hours boded well for the 2017 crop. But flooding of root systems for several weeks increased insect problems and heat waves all took their toll on the crop. Demand for walnuts remains strong, though, as evidenced by the 19 percent growth YoY in both domestic and export shipments during the 2016/17 marketing year.

Despite a very wet bloom, the 2017 almond crop is forecast to come in at a record 2.25 billion pounds, up 5 percent from last year. This year's bearing acreage of 1 million acres is a new record, too. (*See Exhibit 12.*) The 60,000 acre increase from 2016 more than offset the lower average nut set this season. Shipments in 2016/17 are up 16 percent YoY, in spite of a 12 percent increase in supply. The increase in shipments has tightened inventory heading into the new marketing year. And with strong late season demand coupled with expectations of only a modest increase in the new crop, almond prices have been edging higher and will continue firming during the transition to the new crop.

From initial assessments and surveys, it would appear that Hurricane Irma has resulted in significant damage to the Georgia pecan crop. Georgia is the largest pecan-growing state in the U.S. and almost every orchard in the state was affected with many trees blown over and green nuts blown off the trees. One estimate indicates that upwards of 30 percent of the state's crop has been lost due to Irma, but more damage could appear as the season progresses due to bruising and impaired development of the remaining crop. The full impact of Irma will only be known post-harvest.

Depending on how much foliage is lost, nut crops in areas hit by hurricanes in September or later are typically impacted the following year as well. The crop losses sustained due to Irma are also likely to impact prices. Tighter supplies could mean sustained higher prices not only during the peak marketing period, but throughout the season. However, it's still too early to say what the price impacts might be and whether next year's crop will be affected.

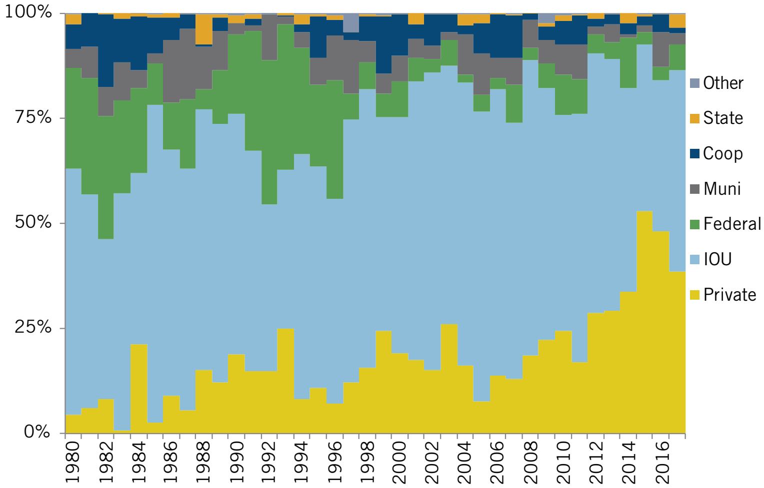
INFRASTRUCTURE INDUSTRIES

Power and Energy

The Senate confirmed President Trump's nominees to fill two of the four open seats on the Federal Energy Regulatory Commission (FERC) this quarter. The agency now has a quorum for the first time since February, allowing it to weigh in on crucial regulations impacting the U.S. energy sector.

The FERC's newly formed quorum could be required to weigh in on the fate of the Public Utility Regulatory Policies Act (PURPA) in the months ahead. There is growing opposition to PURPA among utilities, and the House Energy and Commerce Committee held a hearing on September 6, 2017 to explore arguments from both critics and supporters of the law. The fate of the law is critically important for private developers since it is likely to be the single largest driver of utility-scale solar in the years ahead.

EXHIBIT 13: Share of Annual Capacity Additions by Ownership Type



Source: ABB Velocity Suite

PURPA requires utilities to buy output from small renewable energy facilities at a utility's avoided cost. Eligible projects must run on biomass, waste, geothermal, or renewable energy, and not exceed 80 MW in capacity. The project is granted Qualifying Facility (QF) status under PURPA if it meets these requirements. Once built, the local utility is required to purchase the output from this QF, no questions asked.

The law has been instrumental in expanding renewable energy across the country, and increasing the presence of private developers in the U.S. power sector. The private sector has accounted for almost half of all new builds since 2015, ballooning from an annual average of 15 percent over the previous 35 years. (*See Exhibit 13.*)

PURPA has provided the most support to the solar industry. Private developers own 50 percent of all large-scale solar currently operating in the U.S., compared to 32 percent of wind capacity, and 18 percent of natural gas capacity. Currently there are 31 gigawatts (GW) of solar capacity that are either under construction or are proposed to come online through 2019. Twenty-six of the 31 GW will be privately owned. Roughly 65 percent, or 17 GW, of privately owned solar projects are being developed as QFs under PURPA.

Opponents of PURPA suggest that that the law's mandatory purchase obligations can displace energy from more efficient power plants, raising costs for consumers. This is largely because output from QFs is not obtained through a competitive process. Furthermore, the avoided cost that a utility must pay for energy purchased from a QF can be based on stale data, and does not always track current market conditions or the falling cost of wind and solar. This disconnect can provide windfall profits for developers of QFs.

Critics suggest multiple changes to the law, including requiring QFs to negotiate with utilities on power purchase contracts or bid into organized wholesale markets like other suppliers, lowering the 80 MW threshold, and modifying must-purchase contracts to consider utilities' needs and resources.

A growing number of utilities will become increasingly vocal in their opposition against PURPA with the proliferation of QFs. This will ensure greater scrutiny from lawmakers and regulators. It is worth noting that Congress came very close to eliminating PURPA under the Energy Policy Act of 2005. At that time, only 0.350 GW of solar QFs were contracted under PURPA.

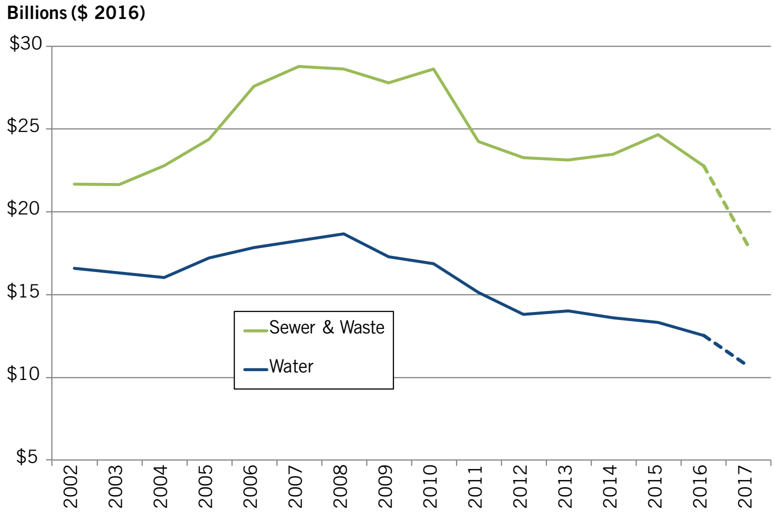
Any potential repeal of PURPA will certainly slow the growth of renewable energy, namely solar, in the U.S. Repealing the law also poses risks for small renewable energy projects that are currently selling energy under a power purchase agreement (PPA). Many developers assume these small renewable projects will fall under PURPA once the current PPAs expire. However, project owners could have trouble finding a buyer for the energy produced from these assets if the law is repealed before the expiration of the current PPAs.

PURPA is certainly under attack and will likely be tested further. Recent changes to the FERC's regulatory body could result in sweeping changes to the law sooner than later.

Rural Water Systems

The future availability of federal funding to rural and underprivileged communities for the development of water and wastewater infrastructure remains highly uncertain. Stakeholders across the industry will be closely following proposed changes to the federal budget, and the fate of multiple bills that could change the trajectory of financing for water infrastructure in the U.S.

EXHIBIT 14: Water Utility Capital Expenditures



Sources: U.S. Census Bureau, CoBank
Note: Dashed line forecast is based on annualized data through July 2017

The White House slipped its proposed $1 trillion public-private infrastructure bill into the 2018 budget. Despite the significant attention around the proposed infrastructure bill, concrete details that outline how the plan will be administered are non-existent. Stakeholders agree that the bill faces multiple challenges before political will at the federal level can translate into actionable project opportunities. Furthermore, only $200 billion of federal funds will be allocated to the $1 trillion plan over the next decade, the remainder is expected to be met with state and local funds and private capital. The inclusion of private capital is a cornerstone of the bill. To attract more private capital to the water industry, the House of Representatives introduced the Sustainable Water Infrastructure Investment Act (H.R. Bill 3009). The bill would remove the volume cap on the issuance of tax-exempt private activity bonds (PABs) for water projects in the U.S.

Tax exempt PABs are issued by municipalities on behalf of private sector project developers. Currently there is a cap on the volume of tax-exempt PABs that can be issued each year. Industry stakeholders remain skeptical that the sector would see a raft of additional private water projects even if the bill is passed into law. Nevertheless, passage of the bill would send a positive signal to the private sector.

However, many public water utilities oppose private water companies taking advantage of subsidies that are funded through taxpayer dollars. Opponents argue that any federal subsidy that is provided to a private company should be separated from subsidizing that company's profits.

In addition to expanding funding for federal tax subsidies that are more targeted to private water, the President's proposed fiscal year 2018 budget eliminates all USDA rural development water funding. Last year the USDA deployed roughly $522.4 million in funds for almost 600 water project across 500 rural communities. USDA funding for water systems remains crucial to the long-term sustainability of rural communities.

Despite the proposed elimination of USDA funding for rural water systems, the industry is relieved that the allocation to the Drinking Water and Clean Water State Revolving Fund (SRF) programs will be maintained at $2.3 billion in the president's proposed 2018 budget. Furthermore, Congress has proposed two bills that could enhance SRF allocations, particularly for rural communities.

U.S. representatives introduced the Safe Drinking Water Act Amendment (H.R. Bill 1068) earlier this year, which addresses emerging concerns over contaminants in drinking water and proposes to reauthorize the Drinking Water SRF program for five years and boost its funding to $3.13 billion the first year, ramping up to $5.5 billion in the final year. On the other side of the aisle, Republicans introduced the Drinking Water Affordability Act (HR Bill 1653). This bill is particularly important to rural water systems because it proposes to increase the share of SRF subsidies to disadvantaged communities, and increase the timetable for paying back a SRF loan from 20 to 30 years and up to 40 years for disadvantaged communities.

Spending on capital expenditures by water utilities was down 19 percent through the first three months of 2017, compared to the previous year. (See Exhibit 14.) Investments in water and wastewater infrastructure will continue to stall until there is more certainty around the 2018 federal budget and the bills that affect water financing.

Telecommunications

The communications industry continues its mission to deliver faster internet speeds to meet ever-increasing demand. The number of U.S. broadband subscriptions grew by 2.5 million last year. North American broadband households use 190 gigabytes (GB) of data each month and by 2021 data consumption will reach 85 exabytes (EB) per month, or the equivalent of 11 billion DVDs worth of traffic. At the end of 2016, the average connection speed in the U.S. improved 21 percent and reached 17.2 megabits per second (Mbps). Notably, Speedtest users reported average download speeds of 70 Mbps from a fixed connection and 23 Mbps from a mobile connection; up from 48 Mbps and 19 Mbps, respectively, from the previous 12 months. Providers now deliver at least 25 Mbps to 64 percent of rural residents, a monumental improvement from 17 percent in 2016. Despite the headway, a clear urban-rural divide persists, as 97 percent of non-rural residents can get 25 Mbps service.

Several price cap companies announced that Universal Service support is allowing them to deliver faster speeds to previously underserved areas. However, that is unlikely to be the case in the nation's more rural locations. Ajit Pai, the Federal Communications Commission (FCC) Chairman, devoted the agency's August open meeting to rural issues and named it Rural Broadband Month. In keeping with the theme, the FCC voted to move forward with an auction for nearly $200 million in high-cost support, streamline reporting processes and examine rural call completion solutions. However, many rural providers and advocates were dismayed that the FCC failed to address the $210 million annual Universal Service funding shortfall and variable budget control mechanisms. Some providers have seen a 12.3 percent funding decrease since January 2017 due to the strict budget controls. Rural advocates warn that the shortfall and unpredictable controls will stunt rural investment. A recent analysis pinned the outlay to close the digital divide, fully facilitate 5G and foster innovation throughout the U.S. between $130 and $150 billion, roughly $40 billion of which would fund rural fiber infrastructure. Approximately 82 percent of rural companies reportedly have a long-term fiber network investment strategy.

> *“Rural broadband companies must strike the difficult balance between remaining competitive and financially viable with less support.*

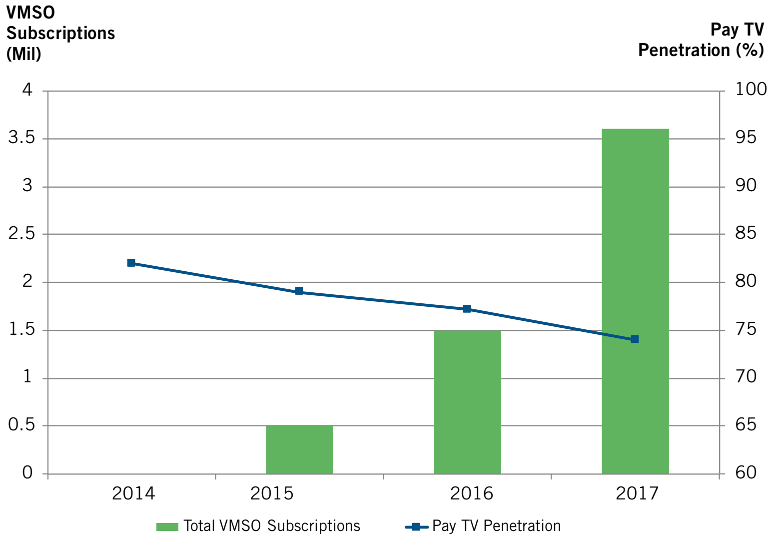
However, a recent poll indicated that 64 percent will cut back on those investment plans for the next several years.

This reality means most rural broadband companies must strike the difficult balance between remaining competitive and financially viable with less support. The majority look to relatively traditional or mainstream solutions. Mergers and acquisitions, cost-cutting measures, market expansion and new complimentary products and services can all effectively improve the customer experience, bolster revenues and in some cases, foster growth. A few companies have applied inventive and contrarian strategies to break out of models that may not provide the desired return, especially for the most rural players.

Going against the grain in the mature broadband market is a daunting prospect that requires vision, planning, customer education and the operational capacity to weather a period of potential losses. Despite these challenges, a CoBank customer that moved from speed-tier to usage-based pricing is reaping rewards for doing so. After internal analyses showed that fewer than 20 percent of customers generated more than 90 percent of the network traffic, and most customers used less than 100 GB per month, the company tested the new model in one of its four competitive markets. The usage-based plan delivers the company's highest connection speed possible for a flat monthly fee plus a charge for each GB consumed. Assuming 100 GB usage rate, the majority of its customers now pay roughly $40 a month, which falls well below the national median broadband price of $80. When the company gained a take rate of 80 percent in less than a year, it rolled out the model to its other markets, including its incumbent territory.

The company experienced a six-month dip in profitability before it returned to previous levels, and it continues to gain new customers and convert current customers to the new pricing structure. The company also says that

EXHIBIT 15: U.S. VMSO Subscriptions and Pay TV Penetration



Source: Ampere Analysis

complaints, including those posted via social media, are down and customer satisfaction is up. Although a handful of dissatisfied customers have publicly complained that the new pricing has nearly doubled their bill and accused the company of censoring social media complaints, industry analysts concur that metered bandwidth typically leads to improved customer experiences. As customers self-monitor usage, total bandwidth throughput increases and improves speeds, which is a critical issue on shared cable networks. Additionally, the provider also realizes significant bandwidth savings over time, which saves costs and essentially allows them to serve more customers with the same network capacity. Other broadband companies have realized similar network savings and customer experience improvements by providing WiFi optimization services and routers with user-friendly management software.

Comcast and Charter recently agreed to form a wireless partnership in hopes of gaining an edge over mutual competitors and a share of the market that generated nearly $45 million in service revenues in the first quarter of this year. During the agreement period, they will collaborate to improve their wireless offerings, and many expect the relationship will result in a minority investment in Sprint and possibly stem additional product development in the future. While agreements must be mindful of antitrust laws, unexpected or unlikely partnerships can offer valuable results while also lowering the cost and risk of new ventures. Industry insiders point out that rural communications companies can partner with local electric coops to expand footprints, develop and hone new services, and stave off competition from larger providers.

An obvious example in contrarian thinking is T-Mobile with its “un-carrier” strategy. The zany CEO, bright pink campaigns and fee-slashing can seem gimmicky, but the company excels where its competitors falter – providing tangible solutions for its customers’ pain points. The company actively listens to the market and responds to consumers’ problems and desire for value. T-Mobile posted a record-low churn rate for the first quarter of the year, and an independent survey found that 23 percent of T-Mobile customers would not switch networks for anything, compared to 15 percent of AT&T and Verizon and just seven percent of Sprint customers. Lower churn along with an increase in subscribers has allowed T-Mobile to make substantial network upgrades and significantly improve both data speeds and coverage.

Traditional pay TV companies are now offering skinny bundles, streaming-only subscriptions, and partnering with over-the-top (OTT) providers to stem the steady cord-cutting trend. (*See Exhibit 15.*) The new offerings likely cannibalize a portion of the pay TV base, but they also provide flexibility and lower-cost options that the cord-cutter and cord-never groups desire, and add value for the traditional subscriber. Some may question continued investment in an intensely competitive and low-margin service offering, especially when most pay TV providers tout a broadband-first strategy. Though it is too early to tell if the actions will slow pay TV losses, legacy cable companies understand the importance of engaging customers with the right service mix to ultimately retain their broadband subscriptions, which currently account for 64 percent of the U.S. broadband market share.

While these experimental approaches do not discount the success of tried and true models, they clearly display the level of innovation and risk some companies are taking to remain competitive and relevant in the communications industry. These strategies also underscore how businesses are evolving to provide customer-focused solutions that deliver the services and experiences customers desire.

This quarterly update is prepared by the Knowledge Exchange Division and covers the key industries served by CoBank, including the agricultural markets and the rural infrastructure industries. Analysts at Plus One Strategic Communications LLC prepared the overview of the communications industry.

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