THE QUARTERLY

Dedicated to the industries financed by CoBank

April 2021

We're Not Going Back to Pre-COVID Conditions

In Washington, policy focus is shifting to building for the future. On the rural front, agriculture has its swagger back.

Executive Summary

Anticipation of a return to normal is in the air. But for the economy and rural industries, there will be no going back to pre-COVID conditions. The combination of trillions of dollars in federal stimulus spending, warm weather, vaccinations, and a persistently dovish Fed will soon generate a burst of economic activity unparalleled since 1984. But the impending release of cash-rich, inoculated consumers has spurred concern about a risk that's also been dormant since the 1980s: inflation.

The policy focus in Washington is shifting from crisis management to building for the future. And the outcome of the president's infrastructure plan will have substantial implications for rural water, power, and broadband providers. Hundreds of billions of dollars in funding would reshape these industries and intensify the current focus on climate resilience and social equity.

Elsewhere in rural industries, agriculture has its swagger back. Many in the agricultural industry are experiencing the best market conditions since 2013. Prices are hovering near multi-year highs as strong exports and dwindling supplies have solidified a healthy outlook for much of the farm economy. Some sectors have been severely impacted by logistics complications and container shortages, though. The dairy and specialty crop supply chains have been especially hard hit.

The transition to a less COVID-restricted world has begun. But we're not going back to the way things were. A transformed policy environment and awakened commodity markets are making way for a whole new operating environment.

Topics In this Issue:

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

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SPOTLIGHT

An Infrastructure Plan Headed for Reconciliation

By Dan Kowalski

The $1.9 trillion American Rescue Plan Act passed by Congress in March was designed to provide near-term help to those hurt by the pandemic; the newly announced $2.3 trillion American Jobs Plan is an infrastructure package intended to shape the economy for the long run. One plan to minimize the scarring of the pandemic, one to ensure that the U.S. is competitive globally in the future.

The infrastructure package as detailed last week would have far-reaching impacts on rural industries, including the following provisions:

- $620 billion for traditional infrastructure to repair 20,000 miles of roads and 10,000 bridges, with $17 billion for ports and waterways.
- $111 billion for water infrastructure, in part to replace all lead pipes to 9 million U.S. homes.
- $100 billion for rural broadband to connect 30 million homes lacking adequate coverage, and achieve universal, affordable broadband by 2030.
- $174 billion related to electric vehicles to build 500,000 new charging stations and provide tax credits and subsidies for manufacturers and consumers.
- $100 billion to improve the electrical grid, including incentives to construct high-voltage lines that support more renewable transmission. This is a key element to President Biden's plan to make U.S. electric generation carbon-free by 2035 and to achieve net zero carbon emissions by 2050.

Both political parties agree that serious investment in infrastructure is long overdue. For perspective, government infrastructure spending peaked in the 1950s and 1960s at roughly 6% of GDP. Support levels fell dramatically in the 1970s and again in the post Great Financial Crisis (GFC) years of the 2010s. Many have called this post-GFC period a lost decade, noting that if we had kept the pace of pre-GFC spending, we would have invested another $1.5 trillion in infrastructure between 2009 and 2019. Today, investment is under 2% of GDP, the lowest level on record going back to the 1940s.

Of course, the points of view in Washington diverge when it comes to what infrastructure spending should look like and how it should be funded. But given the current majorities in Congress, and the opportunity to use the budget reconciliation process again this year, we believe that much of this plan will be translated into a bill that will pass in the summer or fall of 2021.

Economists don't see eye-to-eye on how much the plan would bolster or hurt the economy through 2022, but there is consensus that it would be a longer term boon to GDP and productivity, and a critical factor in fending off China's economic threat. Infrastructure spending has a very large multiplier effect on the economy – about $1.50 is generated in the economy from every dollar spent. But Moody's stipulates that infrastructure projects would not get off the ground until later in 2022, and higher corporate taxes, if passed, would more than offset the economic gains next year. Thereafter, the plan would add 2 million jobs and boost GDP as much as 1.6 percentage points, with the biggest gains in 2024.

MACRO ECONOMIC OUTLOOK

Inflation: The Question Isn't Yes or No, It's How Much

By Dan Kowalski

The economy continues to outperform expectations as stimulus funds power robust consumer spending. In fact, U.S. consumers had $2.7 trillion more in their bank accounts at the end of 2020 than they did at the end of 2019 – a 24% increase. Debt service payments as a share of disposable income also reached an all-time low in 2020, in part because of forbearance, but also because about one-third of stimulus checks were used to pay down debt. And if you were fortunate enough to 1) maintain employment through the pandemic, 2) own equities, and 3) own your home, you are probably in much better financial shape than you were a year ago.

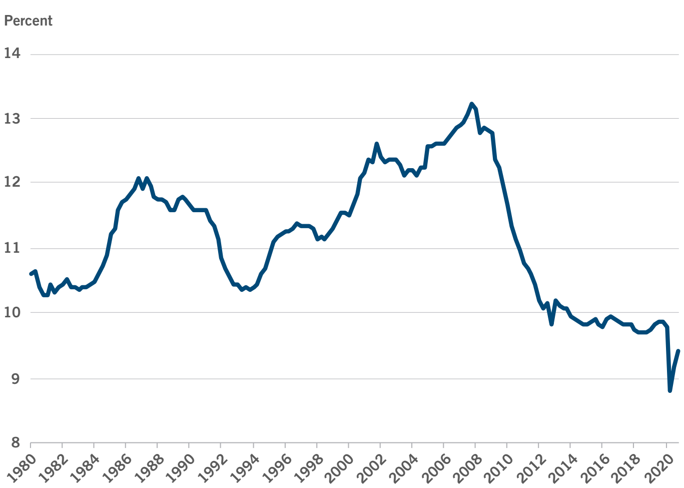
Still, even after a blowout 916,000 jobs were added in March, about 8.4 million people who had jobs pre-COVID still are not back to work. Most are tied to the service and hospitality industries, and are expected to be in high demand this summer as vaccinations are made available to everyone and warm weather prods us all to venture back into public spaces.

All of this, plus the potential for more federal stimulus, points to a very rosy outlook for the second and third quarters this year. Consensus forecasts point to 7% GDP growth for 2021, the fastest rate of expansion since 1984. And roughly 40% of that GDP growth is likely to be a direct result of federal stimulus.

1 **Consensus forecasts point to 7% GDP growth for 2021, the fastest rate of expansion since 1984.**

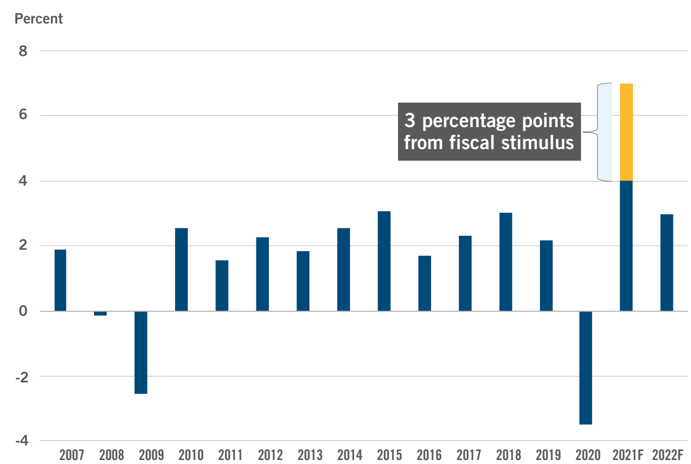
2 **Prices at the producer level are rising across most industries, and many of those higher costs will be passed on to consumers in the coming months.**

EXHIBIT 1: Household Debt Payments as a Share of Disposable Income



Source: U.S. Board of Governors of the Federal Reserve

EXHIBIT 2: U.S. Real GDP Growth



Source: Oxford Economics, CoBank

We will all be ready to spend more on services in coming weeks, and the supply chain is already showing signs of strain. Prices at the producer level are rising across most industries, and many of those higher costs will be passed on to consumers in the coming months.

Any inflation that results from this resurgent demand will be in addition to the "base effect" inflation that we are certain to have in coming months. Inflation is typically measured in year-over-year terms, and base effects occur when inflation readings are skewed because of price anomalies in the prior year. In 2020, prices for many goods and services dove in the middle months of the year as demand suddenly dropped. Those 2020 price declines will widen year-over-year inflation over the next couple quarters, and new upward price pressure should push headline inflation above 3%. We expect this burst of inflation to be short-lived as the economy recalibrates, but we could experience inflation over 2% well into 2022.

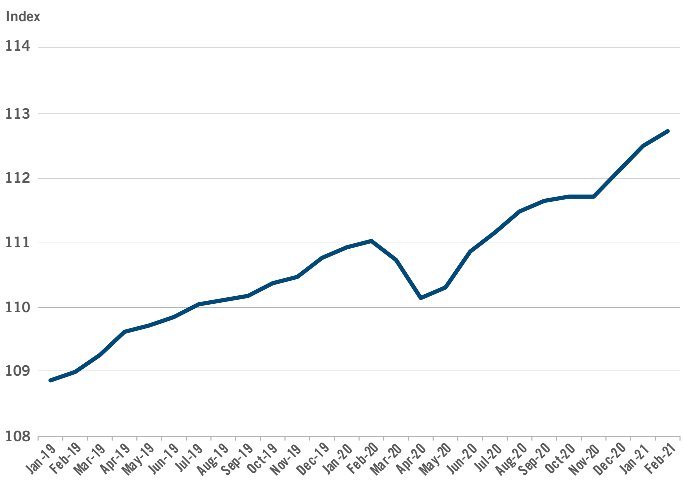
This is the Federal Reserve's preferred scenario as well as its expectation. The Fed plans to run the economy hot through 2021 to repair the economic damage done to employment in the pandemic, and has little fear of worrisome levels of inflation.

The bond market is indicating that traders doubt the recovery will be such an easy glide path. The 10-year Treasury yield has moved substantively higher since the passage of the $1.9 trillion American Rescue Plan, and the yield curve has steepened. But for now, the Fed will continue to do all it can to build confidence in its subdued inflation expectations, its plan to keep up the $120 billion in monthly asset purchases, and its intent to hold off on interest rate increases until at least 2023.

3

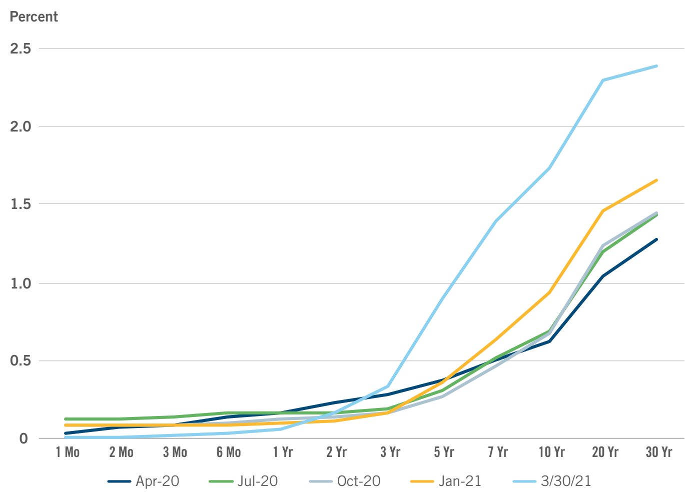
The 2020 price declines will widen year-over-year inflation over the next couple quarters, and new upward price pressure should push headline inflation above 3%.

EXHIBIT 3: Personal Consumption Expenditures Price Index



Source: U.S. Bureau of Economic Analysis

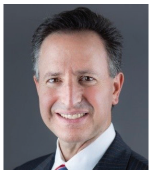
EXHIBIT 4: U.S. Treasury Yield Curve



Source: U.S. Department of Treasury

GRAINS

Rally in Grain and Oilseeds Gains Momentum into Planting Season



By Kenneth Scott Zuckerberg

The cyclical turn in grain pricing, driven by strong export and domestic demand and resulting tight stocks, continued during the quarter and has picked up further gains ahead of spring planting.

The first quarter saw positive momentum for the grain complex on two important measures. First, accumulated exports to China for corn, soybeans, wheat and sorghum increased by 269% vs. a 59% increase to all destinations. Second, prices appreciated 23% for corn, 12% for soybeans, and 28% for soybean oil on the May 2021 contracts.

The U.S. dollar (USD) strengthened during the first quarter, with the U.S. dollar index (DXY) gaining 3.65%. However, DXY is heavily weighted towards the euro and thus, it is more instructive to monitor the USD appreciation or depreciation vs. competitor grain producing regions. In that respect, USD gained 9.40% vs. the Argentine peso, 8.47% vs. the Brazilian real, and 2.29% vs. the Russian ruble.

Although USD strength vs. the peso and real would ordinarily make U.S. grain exports less price competitive, several interrelated factors offset these foreign exchange headwinds: China continues to demand large quantities of feed as it rebuilds its hog

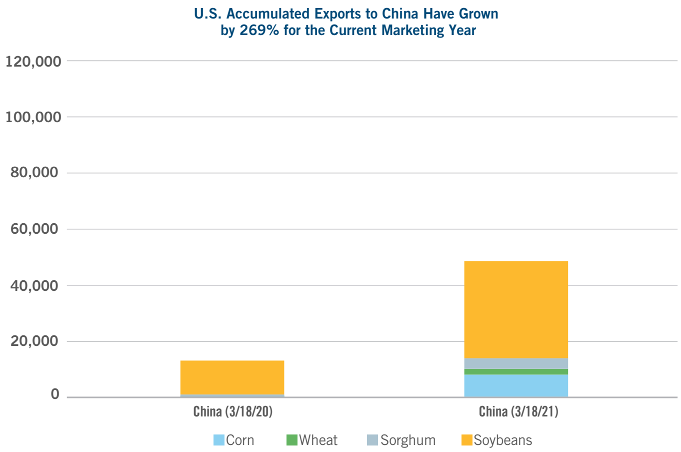
1 **The grain rally has continued and the quarter ended with a positive spike following a "bullish shocker" planting intentions report.**

2 **Planting intentions call for 6.8 million more corn, soybean and wheat acres in 2021. Corn and soybeans fell short of USDA February expectations; wheat came in above.**

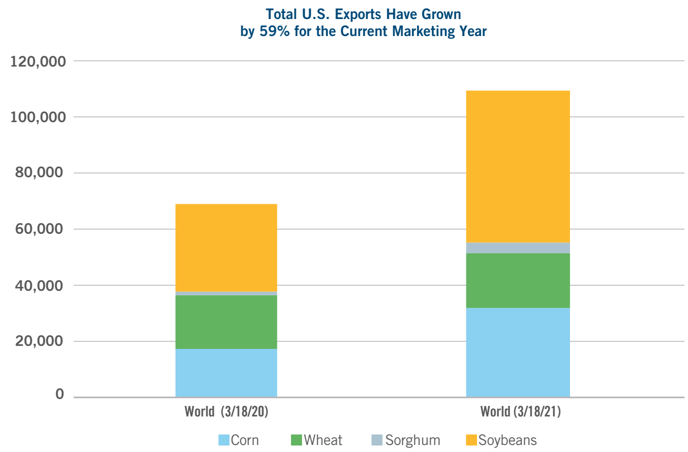
EXHIBIT 1: U.S. Accumulated Exports to China and Total World

Current Market Year to Date

Figures in 1,000 Metric Tons



Figures in 1,000 Metric Tons



Source: USDA-FAS

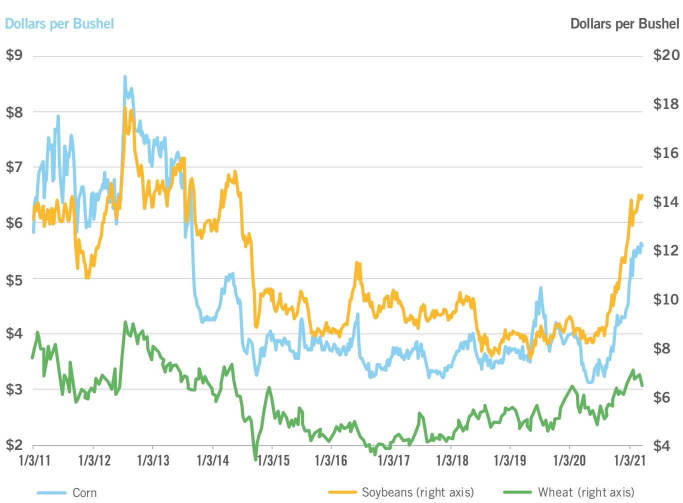
herd, with the U.S. being the main supplier since last fall's harvest. Additionally, local Chinese grain prices are much higher than U.S. export prices, making it cheaper for China to buy abroad. Finally, the Chinese yuan has been stronger than the USD over the past year, making grain and oilseed purchases from the U.S. even less expensive. The situation has allowed China to "buy cheap" even as U.S. prices have risen, allowing the nation to make progress on the agricultural products purchase targets it committed to under phase one of the U.S.-China trade deal signed in early 2020.

While the backdrop for the grain and oilseed complex is positive, there are several issues worth monitoring that could result in price volatility in the coming months. First, a recent surge of African Swine Fever (ASF) in Asian countries could temporarily slow soybean demand for hog feed. Second, the continued inversion in the forward curves for corn and soybean futures eliminates opportunities for positive carry for grain cooperatives. Rising basis levels for corn and soybeans in the country has also tightened margins for grain handlers, but wheat basis was flatter last quarter. The situation is less problematic for growers, however, as new crop prices for corn and soybeans exceed modeled costs of production, allowing farmers to book profits during the 2021 planting season.

3 **Accumulated grain exports to China have been very strong YTD, especially for corn of late.**

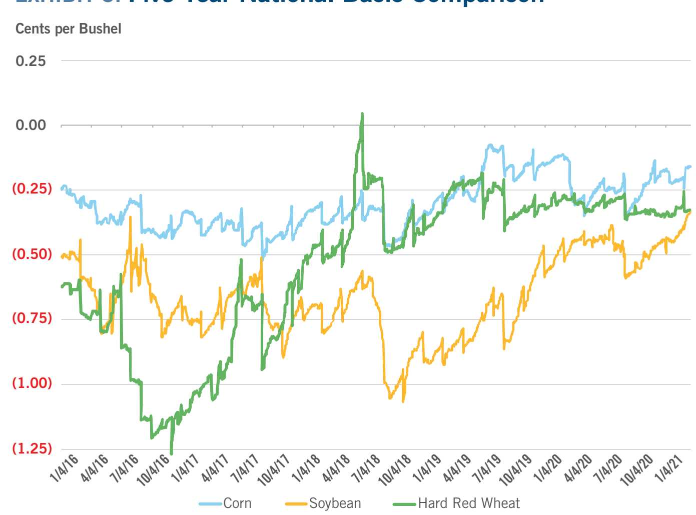
4 **Corn and soybean basis has tightened nationally as demand continues to drive tight supplies. Wheat was flatter.**

EXHIBIT 2: Weekly Cash Prices



Source: BarChart.com

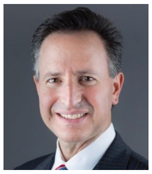
EXHIBIT 3: Five-Year National Basis Comparison



Source: BarChart Commodity View

FARM SUPPLY

A Third Consecutive Strong Season Expected, Barring Weather Shocks



By Kenneth Scott Zuckerberg

Armed with sizeable government payments and a profitable 2020 harvest, U.S. crop farmers increased their agronomy input spending for the 2021 planting season. As a result, ag retailers and distributors expect a full and profitable spring agronomy season due to an increase of 6.8 million planted acres for the three major crops. The underlying components of this increase include acres (in millions) of 91.1 for corn vs. 90.8 in 2020; 87.6 for soybeans vs. 83.1; and 46.4 for wheat vs. 44.3.

We assume that weather will cooperate as spring planting occurs. While much of the Midwest Corn Belt is free of drought, some areas of concern surfaced in late March:

- Northern Indiana, northwest Ohio and southern Michigan have pockets of drought.
- Northwest Iowa remains dry and somewhat problematic.
- Western Nebraska remains dry but has improved incrementally during March.
- North Dakota and South Dakota are most problematic for corn and soybeans, with very little precipitation in several weeks.

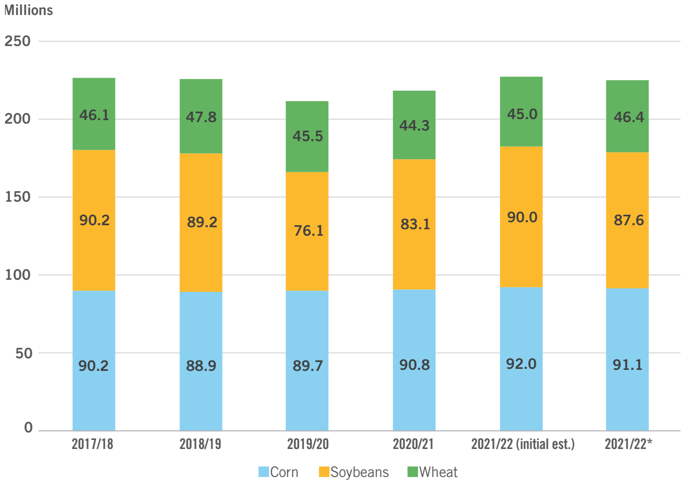
USDA estimates that approximately 20% of U.S. corn production is in areas experiencing drought, down from 40% in October, largely due to increased recent moisture in the southern Plains and western Corn Belt. For soybeans, that figure is 18%, down from 31%. Market commentary suggests that the corn and soybean situation is manageable and is likely to improve after the crops are in the ground. However, spring wheat is problematic with an estimated 78% of production in regions with extreme dryness, specifically North Dakota, northwest Minnesota, and Montana. Poor crop performance may negatively impact agronomy sales and services in affected regions.

1 Ag retailers are positioned to benefit from an **exceptionally strong spring agronomy season,** outpacing fall and spring 2020.

2 Financially strong U.S. crop farmers **should increase spending** given a **3.1% increase in planted corn, soybean and wheat acres.**

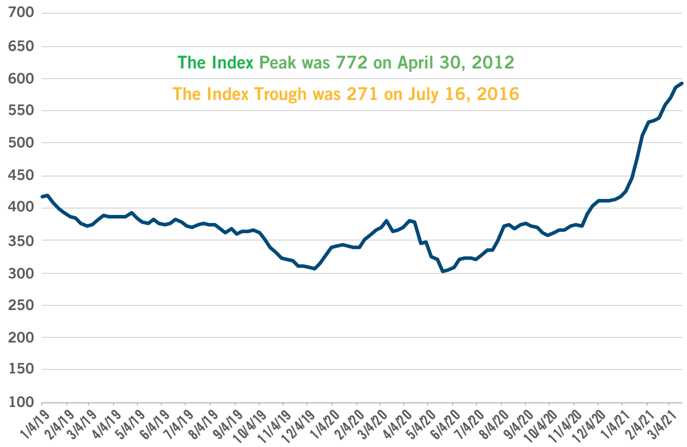
3 **Fertilizer prices rose 42% during Q1** and are now 96% above the trough level in May 2020.

EXHIBIT 1: Actual and Prospective Planted Acres



Source: USDA-NASS Prospective Plantings Report, March 31, 2021

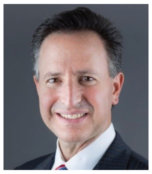
EXHIBIT 2: Green Markets North America Fertilizer Index



Source: Green Markets, FertilizerPricing.com © Bloomberg L.P.

BIOFUELS

Ethanol Recovery in Line; Future Dependent on Policy, Diversification and EV Adoption



By Kenneth Scott Zuckerberg

The U.S. fuel ethanol sector has recovered as we expected; production is running near 90% of pre-COVID levels. The industry is adapting to short- and long-term realities, including changes in driving and work habits, fuel policy directives, and more electric vehicles (EVs).

Commuter driving levels will slowly resume as more people are vaccinated for COVID and driving activity will increase overall as consumers become more comfortable being out in public. Motor gasoline and fuel ethanol demand will likely increase seasonally, and thus the ethanol industry may incrementally increase production in Q2.

The Biden administration has indicated policy support for advanced biofuels, which are alternatives to fossil fuel. However, it is still early in terms of policy. While EPA Secretary Michael Regan has commented on ethanol's benefits in reducing greenhouse gas emissions, President Biden and Transportation Secretary Pete Buttigieg have focused on accelerating the shift towards greater electrification.

Private passenger EVs are a growing long-term threat for U.S. ethanol, and in turn, U.S. corn production. U.S. ethanol plants consumed 5.1 billion bushels or $28 billion (at current prices) of corn on average during the past three crop years – 36% of U.S. corn production. To help offset the inevitable decline in fuel consumption, the ethanol industry must continue to both diversify its product mix and push for expanded fuel ethanol blending rates under the Renewable Fuel Standard.

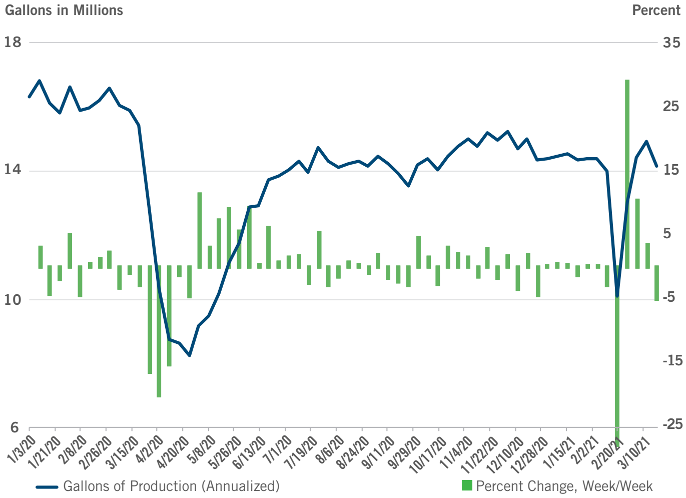
1 **Fuel ethanol production declined in Q1** to about 14 billion gallons as cold winter weather, especially in Texas, reduced production in February.*

2 Operating margins averaged **near $0.10/gallon** but **rose sharply in March to above $0.25** as fuel ethanol prices rose and natural gas prices fell.*

3 China announced it would buy 200 million gallons of ethanol during the first half of 2021, which would **exceed the previous record of 186 million gallons** in 2016.

**as of March 19, 2021*

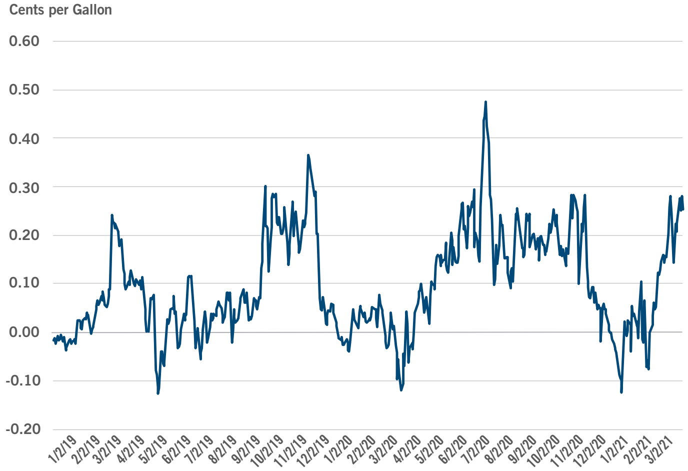
EXHIBIT 1: Weekly U.S Fuel Ethanol Plant Production



Source: Energy Information Institute (EIA)

EXHIBIT 2: Fuel Ethanol Operating Margins

Return Over Operating Costs for Representative Iowa Dry-Mill Corn Ethanol Plant



Source: Center for Agricultural and Rural Development, Iowa State University (ISU-CARD)

CHICKEN

Especially Volatile Q1 Ends with Strong Industry Profitability

By Will Sawyer

U.S. chicken prices started 2021 like a rocket, climbing over 20% in the first quarter. These prices not only offset the double-digit rate of feed cost inflation that started last fall, they brought spot margins well into positive territory. The counts of eggs set and chick placements are a leading indication that chicken production will remain at current levels, so chicken prices continue to look strong through the summer.

February was a volatile month for the chicken sector. Wing prices hit record highs during the Super Bowl and the historic storm reduced chicken slaughter by over 40% in the third week of February compared to the prior week. Plants worked to make up for the lost production time but then resumed pre-storm production levels. Still, chicken slaughter in the first quarter was down close to 4%, leading to the rapid improvement in pricing.

Leg quarter prices have performed just as well as wing prices, especially after the last two quarters. Leg quarter prices climbed to over 40 cents/lb at the end of the quarter, nearly double the price six months ago. This is due in large part to the stabilizing economies in emerging markets that purchase U.S. chicken, especially the Caribbean and West Africa.

Given the U.S. chicken sector's slow production start in 2021, we expect annual production to be even with 2020. We also expect that the presumed increases in vacation and business travel this summer will boost food service sales and help the chicken sector continue to offset ongoing double-digit feed cost inflation.

1 February's deadly winter storm and industry supply contractions **drove a significant reduction in chicken production.**

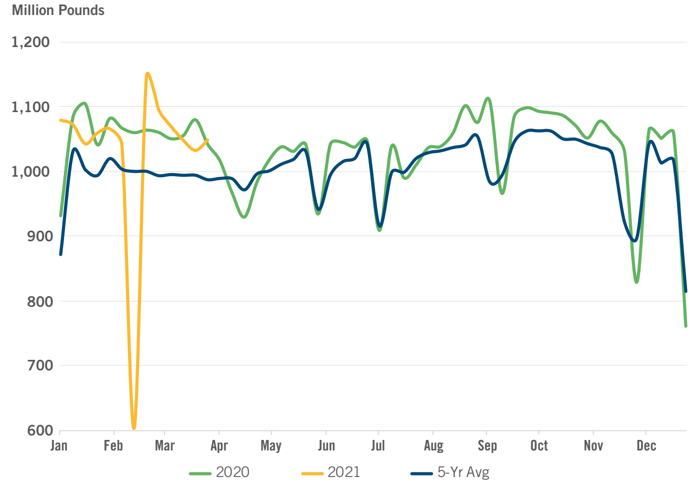
2 **Chicken prices have climbed in Q1,** bringing most producer **margins into positive territory.**

3 Indications are that **supply will grow very little** for the remainder of 2021.

EXHIBIT 1: Leg Quarter Prices

Source: USDA-AMS

EXHIBIT 2: Weekly U.S. Chicken Production



Source: USDA-AMS

BEEF

Historic Winter Storm Couldn't Disrupt a Robust Start to 2021

By Will Sawyer

U.S. beef demand has been incredibly strong in the first quarter despite the challenges in foodservice and the away-from-home dining sector in particular. Strong demand and expectations for limited supply growth in the back half of the year have driven up cattle futures.

Mid-February's major storm and freeze had a meaningful impact this quarter on the U.S. cattle and beef sectors, for both production and demand. Cattle slaughter fell by nearly 10% in the third week of February when extreme cold interrupted beef plant operations. On the demand side, foodservice sales showed signs of improvement in January, but were slowed in February by the winter weather. The positive outlook for beef demand is highly driven by the recent progress in the COVID-19 vaccine roll out.

The beef sector headlines in the first quarter highlighted projects to build new plants or expand capacity of current plants. The beef industry's limited capacity operating environment has only been made worse by the COVID-19 pandemic. While we expect only limited capacity expansion in 2021, expansion in coming years will be critical to improving profitability in the cow/calf, stocker, and cattle feeding sectors.

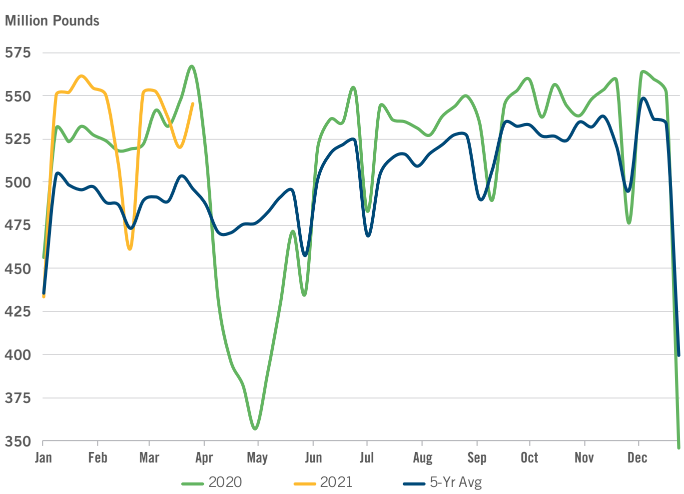
The USDA expects beef production to decline by 3.5% in the back-half of 2021, which, along with much stronger foodservice demand, has helped to lift cattle prices nearly 15% above year-ago levels. This should bring some much needed profitability to producers who have experienced difficult margins during the pandemic.

1 Mid-February's major storm and freeze caused a brief slowdown in beef processing and demand.

2 Foodservice remains below year-ago levels, but that didn't stop beef prices from climbing in the first quarter.

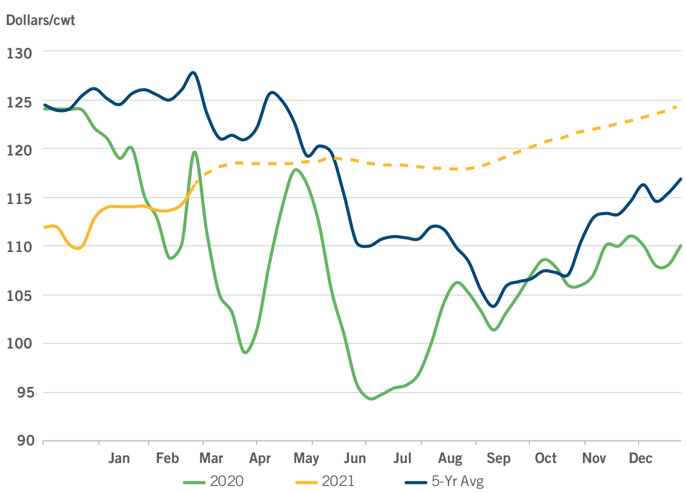
3 Packer margins remain elevated but producers are expected to realize better margins in the second half of 2021.

EXHIBIT 1: Weekly U.S. Beef Production



Source: USDA-AMS, CoBank

EXHIBIT 2: Live Cattle Prices



Source: USDA-ERS

PORK

Sturdy Demand Puts Feed Cost Inflation in the Backseat

By Will Sawyer

Strong first quarter demand and indications of limited-to-any growth in pork supply has lifted profitability for the hog sector to levels not seen in many years. Concerns over feed and other cost inflation has taken a back seat to optimism for another year of strong pork exports and robust domestic pork demand as U.S. consumer behavior slowly returns to normal. China has slowed its hog herd rebuilding due to increased African Swine Fever (ASF) cases this winter, helping drive the positive outlook for the remainder of the year.

China has been rebuilding its hog herd since late 2019, but an increase in ASF cases caused China's hog herd to contract in January and February. While solid information is difficult to come by, we expect this to be a brief setback to China's directive to regain self-sufficiency for domestic pork demand. This is good news for this year's U.S. pork shipments, as the decline from 2020's record exports may be less than feared.

Year-over-year pork production in the first quarter was down slightly because in March 2020 U.S. pork plants ran at full speed due to fears of COVID-19 driven plant shutdowns. U.S. pork production was also hurt in February during the severe winter storm that affected plants and livestock shipments in the southern Plains.

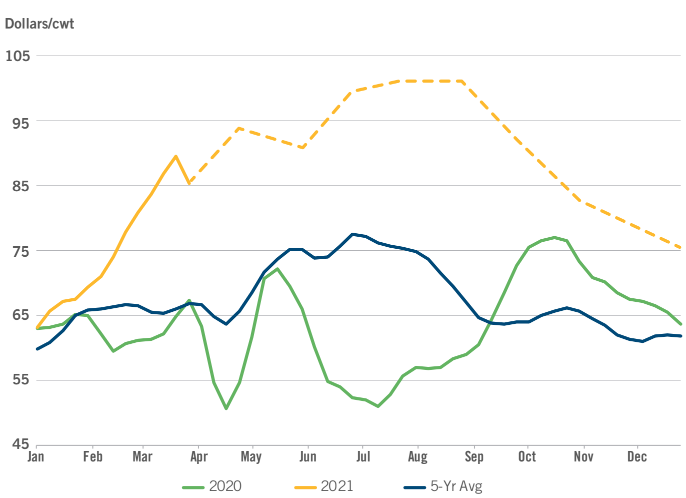
We expect feed cost inflation in 2021 of nearly 30%, the highest increase since 2011. Yet, based on anticipated hog prices, producers could earn between $25 and $30 per head. The robust U.S. stimulus and significant progress in the vaccine rollout has lifted hopes for a meaningful return to eating out in the second half of 2021.

1 **Pork demand domestically and in international markets makes 2021 a very profitable year for the U.S. pork sector.**

2 **Feed cost inflation of 30% will be more than offset by hog prices this summer, double year-ago levels.**

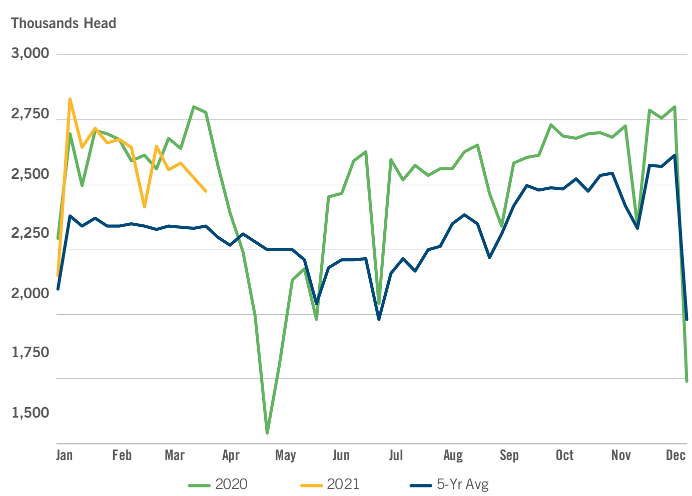
3 **ASF issues in China to keep U.S. pork shipments at a high level but China will continue rebuilding.**

EXHIBIT 1: Hog Prices



Source: USDA-AMS

EXHIBIT 2: Weekly Hog Slaughter



Source: USDA-AMS

DAIRY

Trade Logistics Snarl U.S. Dairy Exports

By Tanner Ehmke

The U.S. dairy export pace started 2021 on a weaker note as dairy exporters continue to struggle with trade logistics, specifically with the scarcity of containers, port congestion, and rising transportation costs. China, the world's largest dairy importer, took in a record amount of dairy products in January from all origins, but the U.S. was not the main beneficiary of that increase. The worsening problem with trade logistics has put the U.S. at a disadvantage to other major dairy exporters like Oceania and the EU. U.S. nonfat dry milk exports in January fell 17% YoY, cheese exports for the month dropped 34%, and exports of other dairy products fell 14%.

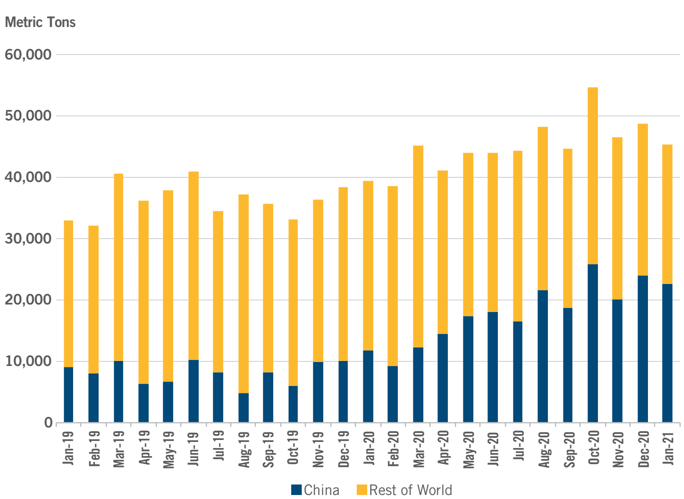
Only dry whey exports saw a YoY increase at the start of the year, up 3%, riding the export momentum from 2020 to supply feed ingredients to China as it continues to rebuild its hog herd. However, logistics issues still limited whey exports: Whey demand was below 2018 with China leaning more heavily on the EU, Belarus, and Turkey for whey imports to circumvent the logistical constraints in the U.S. Concern is rising in the U.S. that its reputation for reliability will be tarnished should the container shortage persist, thereby potentially ceding market share to competing suppliers around the globe long term.

New Zealand recorded record shipments of total dairy products to China in February, taking advantage of its proximity to China and the dislocation in trade with the U.S. Most of New Zealand's growth was in whole milk powder, fluid milk, and cream.

1 U.S. dairy exporters **continue to struggle with snarled supply chains,** with many dairy products shifted to domestic use.

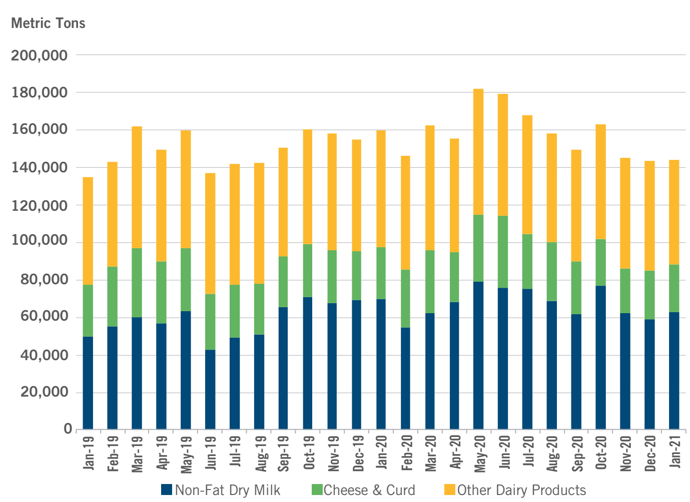
2 Worsening trade logistics **has put the U.S. at a disadvantage to other major dairy exporters** like Oceania and the EU.

EXHIBIT 1: U.S. Dry Whey Exports



Source: USDA-FAS

EXHIBIT 2: Other U.S. Dairy Exports



Source: USDA-FAS

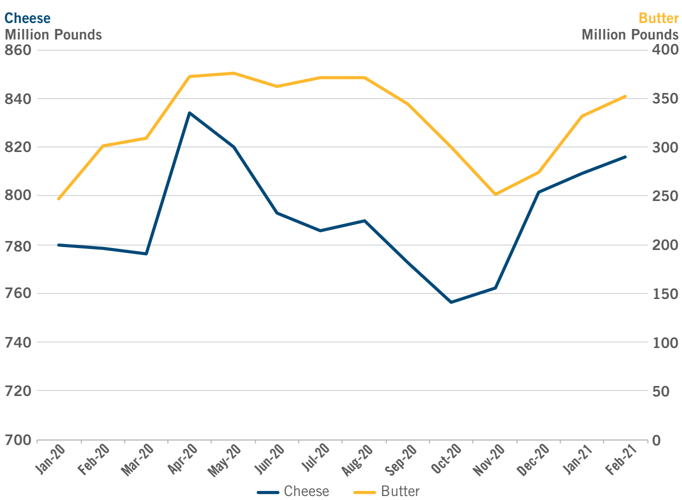
U.S. consumers, though, are doing their share to make up for lost export opportunities by eating a record amount of cheese and butter in 2020, and that momentum has carried into the first quarter of 2021. Foodservice demand for dairy products like cheese and butter is recovering modestly, with demand expected to tick upward following the issuance of stimulus checks from the U.S. federal government's American Rescue Plan Act of 2021.

Cheese and butter stocks continued their rapid ascent, climbing 5.4% and 16.8% YoY, respectively, for February. U.S. milk production rose in January and again in February, giving dairy processors ample milk supplies for processing. Butter, cheese, and nonfat dry milk production set new records to start the year. Extreme weather in February caused power shutdowns, dislocating supply in Texas and resulting in 90 million pounds of milk being dumped – roughly 0.5% of national milk production. USDA included dumped milk in its production estimate.

No shortage of milk is on the horizon in the U.S., with production expanding through the spring flush. Cow numbers in February reached the highest level in 30 years following months of ongoing expansion. With feed costs the highest since 2014 amid lackluster milk prices – and costs of building materials like lumber, steel, and concrete also rising – dairy producers are rethinking expansion. While cow numbers have increased, the number of licensed U.S. dairy farms at the end of 2020 was 7.5% lower YoY at 31,657 herds, exceeding the average annual pace of decline of 5% over the prior decade.

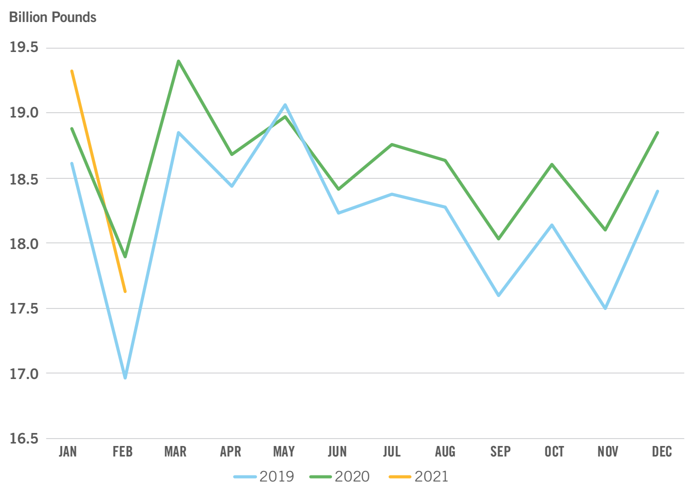
3 **Concern is rising in the U.S. that its reputation for reliability will be tarnished should the container shortage persist.**

EXHIBIT 3: U.S. Cheese and Butter in Cold Storage



Source: USDA-NASS

EXHIBIT 4: U.S. Milk Production



Source: USDA-NASS

COTTON, RICE AND SUGAR

Cotton and Rice Planted Acreage Expected to Continue Decline

By Tanner Ehmke

Combined U.S. cotton and rice planted acreage will fall for the third consecutive year in, according to USDA, as acres shift out of pima cotton and all classes of rice. The surge in upland cotton prices has blunted losses in its acreage. Last year's rally in refined sugarbeet prices also forestalled losses in sugarbeet acreage. The recovery in U.S. foodservice demand remains an unknown for both rice and sugar, while China remains critical for U.S. cotton demand.

Cotton

Cotton prices surged despite ample global cotton supplies. While U.S. supplies are tighter YoY, world inventories are not in short supply. The astonishing rally over the last several months is largely driven on anticipation for global demand recovering as the economy reopens.

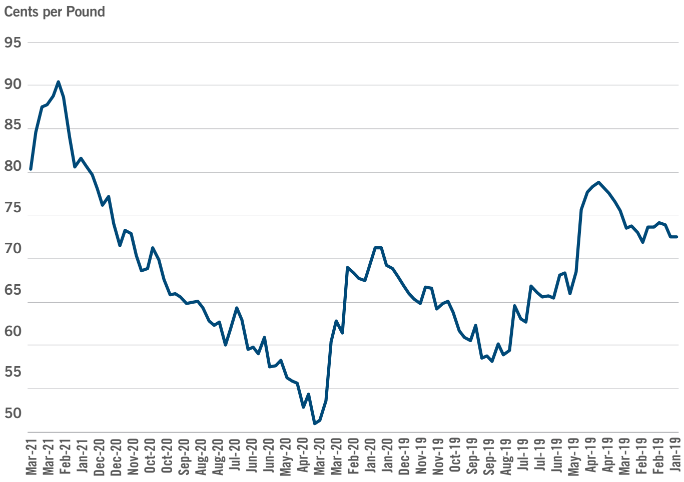
Export demand for U.S. cotton remains tepid with shipments and outstanding sales to Vietnam, Bangladesh, Turkey, and Pakistan sharply lower YoY. Only China has consistently shown strong demand with sales and shipments more than double YoY. Shipments in recent months, though, have been impacted by container shortages.

With prices holding firm, planted acreage is forecasted to dip slightly to 12.04 million, with most of the loss coming from pima cotton. Upland cotton acreage is figured to be nearly unchanged YoY at 11.89 million, according to USDA. Drought conditions in Texas will be closely monitored.

1 As farmers **switch more acres to corn and soybeans** this spring, total **cotton and rice will shrink.** Sugarbeet acres are expected to inch higher.

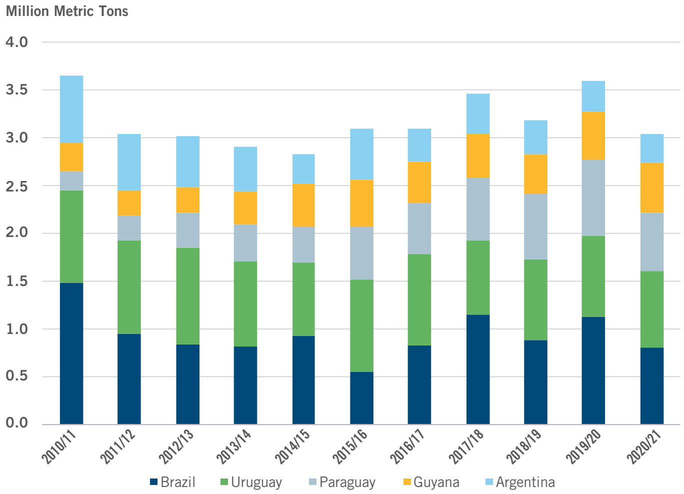
2 Global cotton demand continues to recover with **China holding its place as the key export destination** for the U.S.

EXHIBIT 1: Cotton Futures



Source: Barchart.com, Intercontinental Exchange (ICE)

EXHIBIT 2: South American Rice Exports



Source: USDA-FAS

Rice

U.S. rice acreage will fall sharply this spring as soybeans pull acres out of long grain rice in Arkansas. USDA predicts all rice planted acreage at 2.7 million, down 11% YoY.

Rice inventories in the U.S. remain ample following last fall's rebound in production. Domestic demand remains strong, but all-rice export sales remain sluggish with milled long grain exports particularly slow in the absence of Iraqi and Haitian business.

Rough rice remains the standout leader in U.S. rice exports thanks to Mexico and Brazil's exhaustive import pace. Reports of China releasing rice inventories for poultry feed, the late harvest in Brazil, and declining exportable rice supplies in South America raise hopes of the U.S. seeing renewed demand.

Sugar

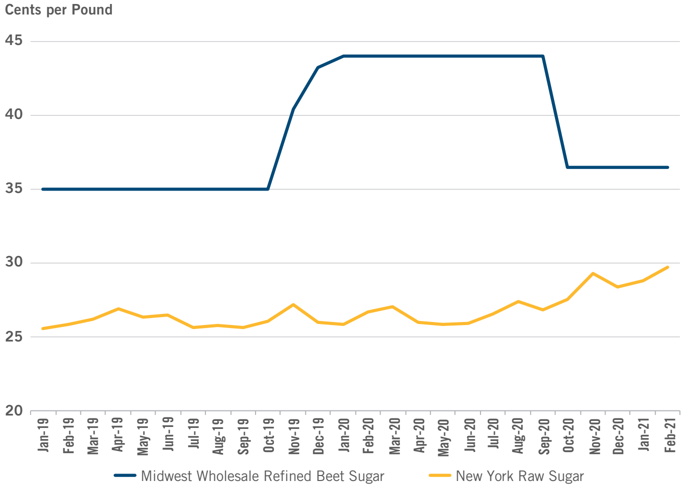
Refined white sugar prices shifted downward on the heels of last fall's rebound in sugarbeet production and strong extraction rates – most recently estimated by USDA at 15.3%, the highest in 10 years. Raw cane production is also anticipated to be strong despite weather resulting in delayed harvest. Raw cane sugar prices, though, have found support on a YoY rebound in refiners melt.

Deliveries from both beet sugar processors and cane sugar refiners have fallen to the slowest pace in five years. Ample supplies and slower deliveries have resulted in a stocks-use ratio of 15.1%, which is within the acceptable range as monitored by USDA.

Reopening the U.S. economy may spur food service demand and draw down current inventories. USDA anticipates sugarbeet planted acreage to inch higher this spring to 1.17 million as farmers commit more acres following last year's higher prices.

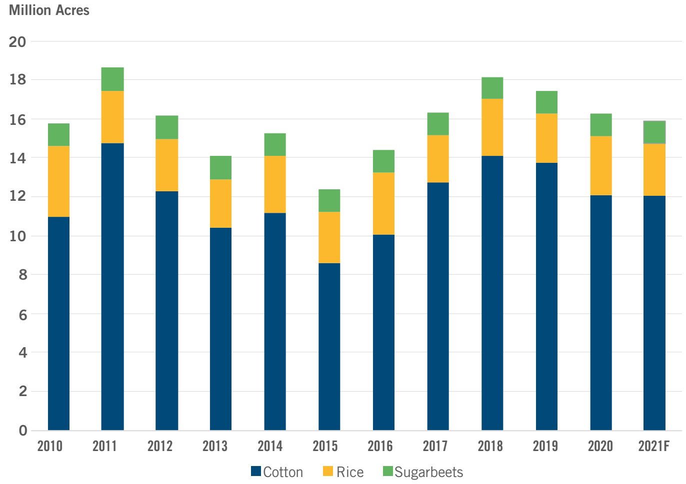
3 **South America rice exports are smaller and slower than normal and China is feeding more rice to poultry, supporting a potential U.S. export recovery.**

EXHIBIT 3: U.S. Refined and Raw Sugar Prices



Source: USDA-ERS, Sugar and Sweeteners Yearbook Table 61, Dec. 17, 2020

EXHIBIT 4: Cotton, Rice, and Sugarbeet Planted Acreage



Source: USDA-NASS

SPECIALTY CROPS

Fruit, Nut, and Vegetable Growers Adapt to Supply Chain Constraints

By Tanner Ehmke

Container shortages, trade logistics, labor reform, and ongoing drought conditions in the West and southwestern U.S. remain major uncertainties for fruit, tree nut, and vegetable growers and processors. But strong consumer demand, driven by a surge in healthy eating at home during the pandemic, has been a bright spot. Tree nut exports have also been resilient in the face of complicated trade logistics.

Markets

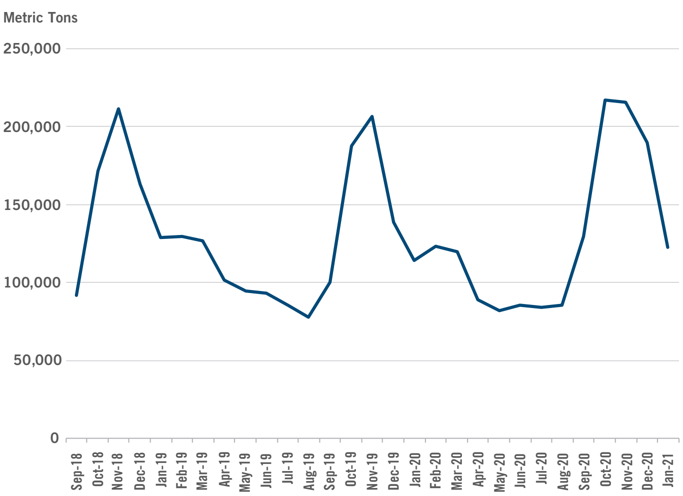
Tree nut exports have reached an all-time high with the peak shipping now drawing to a close. However, container shortages and port constraints are estimated to have delayed U.S. tree nut export shipments 10%-20% in the opening months of the year. The lack of movement could potentially translate into higher than expected tree nut inventories at the end of the marketing season.

Shipping constraints have also affected the export pace of fruits and vegetables. A substantial increase in demand in the U.S., though, has created new marketing opportunities for fruit and vegetable growers as consumers renewed their focus on healthy eating at home during the pandemic. Fruit and berry farmers largely anticipate a strong year ahead following significant jumps in sales in 2020, according to grower surveys conducted by Meister Media. Vegetable growers are also expected to increase production for retail and direct-to-consumer channels in the shift to meet increased demand for at-home consumption.

1 **Shipping constraints have been a headwind for fruit, tree nut, and vegetable exports. However, tree nut exports and fruit and vegetable domestic demand are strong.**

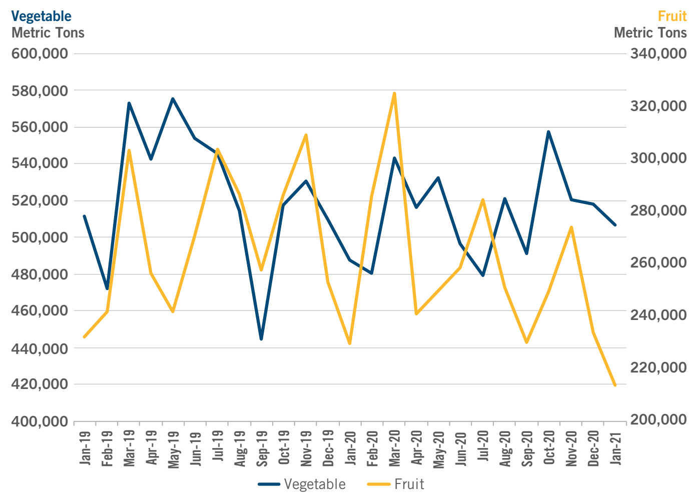
2 **Drought conditions in California are raising concerns of limited water allocations in the forthcoming growing season.**

EXHIBIT 1: **U.S. Tree Nut Exports**



Source: USDA-FAS

EXHIBIT 2: **U.S. Vegetable and Fruit Exports**



Source: USDA-FAS

Labor

The U.S. House of Representatives passed the Farm Workforce Modernization Act in March – the second attempt to address farm worker immigration issues in the last two years. Among other initiatives, the legislation would provide a path to legal status for undocumented agricultural workers.

The bill would also mandate all farms use E-Verify to determine an employee's work eligibility. It would also reform the H-2A guest worker program to simplify the filing process, cap wages, and open the program to other agricultural industries that require a year-round workforce, like dairies and nurseries. Despite the abundance of unemployed workers during the pandemic, H-2A visa applications reached a new record high in 2020 as agricultural employers struggled to find willing workers.

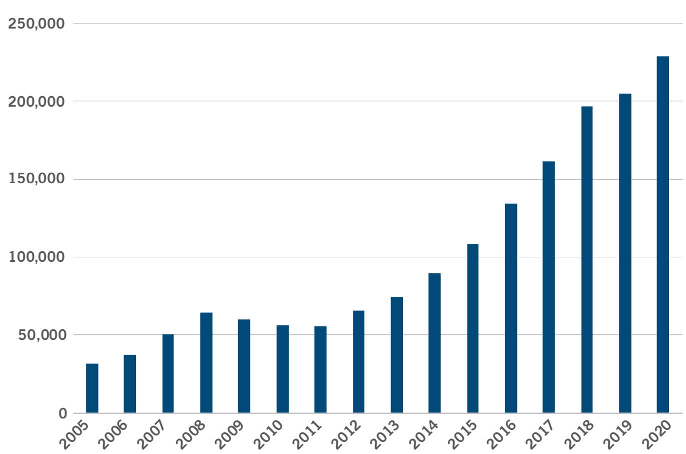
Water

California's Department of Water Resources last quarter lowered its forecast of the deliveries it anticipates to make to cities and farms under the State Water Project. Customers can now expect 5% of contracted supplies, versus the 10% allocation forecasted in December. The state also mailed early-warning notices to water rights holders, advising growers to increase water conservation measures, reduce irrigated acreage, manage herd size, use innovative irrigation and monitoring technologies, or diversify water supply sources.

Drought conditions now envelop 91% of California with more than a third of the state in "extreme" or "exceptional" condition. Snowpack in the Sierra Nevada range is 37% less than normal. Shasta Lake, California's largest reservoir, is two-thirds its normal volume, and Lake Oroville is at roughly half capacity. U.S. Agriculture Secretary Tom Vilsack declared 50 counties natural disaster areas due to drought, making farmers eligible for emergency loans and other assistance.

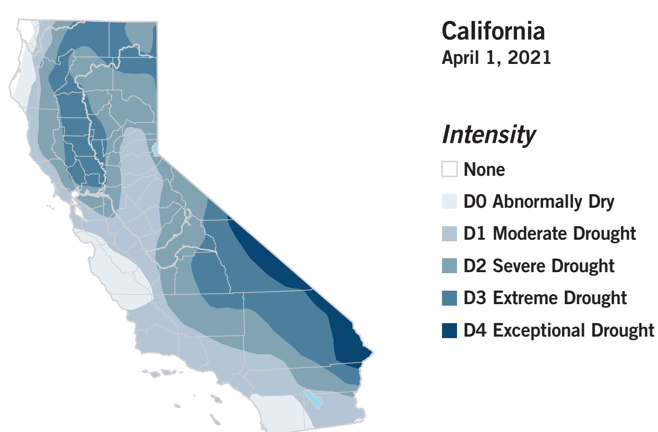
3 **The U.S. House of Representatives passed the Farm Workforce Modernization Act but it has not made it through the Senate.**

EXHIBIT 3: H-2A Visa Applications



Source: U.S. Department of Labor, Office of Foreign Labor Certification

EXHIBIT 4: U.S. Drought Monitor



Source: droughtmonitor.unl.edu

POWER, ENERGY AND WATER

What Does “Build Back Better” Mean for Energy and Water?

By Teri Viswanath

The polar vortex of February 2021 refocused attention on our deficient power, energy, and water infrastructure, and how it is affected by climate change. President Biden, delivering on his “Build Back Better” platform promise, has announced the American Jobs Plan – a $2 trillion infrastructure and economic modernization bill, which includes a major focus on climate change.

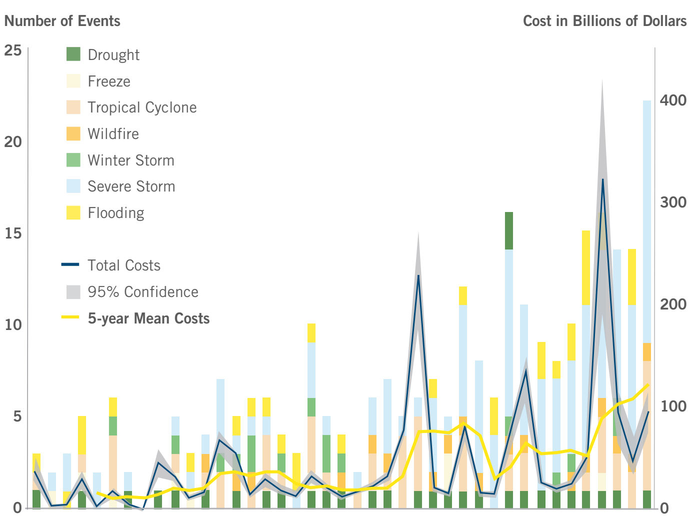
The deadly storm ushered in the coldest air across the central U.S. in more than 30 years. More than 100 million people resided in areas covered by the winter weather warnings and roughly 5 million of those people lost electricity in a handful of southern states battered by the storm. Receiving less attention but causing a similar level of human toll were the half-million people left adrift without water for an extended period in hard-hit communities following that storm.

What is not commonly understood is that widespread failures in energy systems, following climate disasters, tend to have knock-on effect with water systems. Consequently, any climate mitigation program in the U.S. must account for water and energy system dependencies. And the hard-won insights gained over the past winter season, with the Texas crisis representing the largest forced power outages in U.S.

1 **A range of surveys suggest broad public support for direct and historically large government investment in infrastructure.**

2 **Billion-dollar weather and climate disasters are becoming more frequent and more costly, according to the National Oceanic and Atmospheric Agency (NOAA).**

EXHIBIT 1: Billion-Dollar Disasters and Costs (1980-2020)



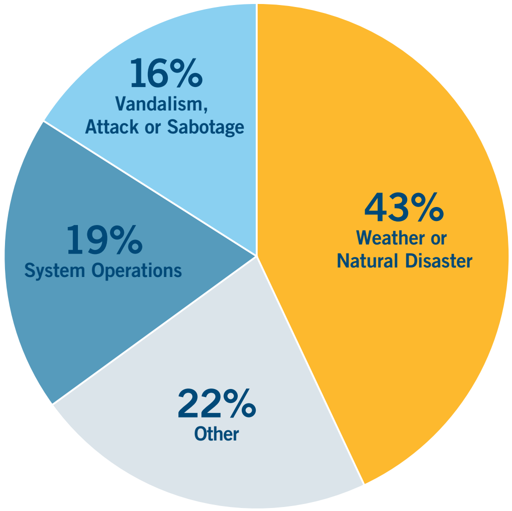
Source: Smith A. 2020 U.S. billion-dollar weather and climate disasters in historical context. Climate.gov NOAA, (Jan 2021) history and possibly one of the most costly natural disasters, might ultimately lead to better climate resilience planning – with such plans hopefully accounting for the energy/water nexus.

It may be instructive to think about the storm and power crisis as a kind of a dress rehearsal for a greater, more disruptive event. Resource loss events, historically occurring at a pace of one day in 10 years, now occur more often. The industry's risk methodology that originated more than 70 years ago (and is widely practiced today) appears to be out of step with this trend. In other words, restoring the grid to its previous state may be an inadequate response in the face of increased stress on infrastructure. It is mission critical for rural electric cooperatives to plan for climate resilience.

The American Society of Civil Engineers (ASEC) graded overall U.S. infrastructure at a "C-" in its latest four-year review, released in early March. While US infrastructure moved up from a "D" grade range for the first time in more than 20 years, significant work remains, the ASEC said. ASCE's 2020 economic study found that the annual drinking water and wastewater investment gap will grow to $434 billion by 2029. To meet the latest state-driven Renewable Portfolio Standards in generation infrastructure, the gap is projected to grow to a cumulative $197 billion by 2029. Taken together, rising threats mean that fortifying infrastructure to handle extremes is all the more important. Delays in addressing resilience simply multiply the associated costs.

3 It may be instructive to think about February's storm and power crisis as a kind of a dress rehearsal for a greater, more disruptive event.

EXHIBIT 2: Causes of U.S. Reported Electric Disturbances in 2020



Source: U.S. Department of Energy

COMMUNICATIONS

FCC Criticized for RDOF Results as Administration Funds Critical Broadband

By Jeff Johnston

The initial results of the FCC's phase one Rural Digital Opportunity Fund (RDOF) auction have caused an uproar as some winners received government support for projects beyond anything they have experience deploying. For example, LTD Broadband won support to provide coverage in 15 states; it currently offers fixed wireless service in parts of two states, apparently by using basic off-the-shelf Wi-Fi equipment. LTD Broadband plans to increase the number of states where it will offer service by a factor of 7.5, presumably with technologies it has never deployed before. Even more concerning is the FCC's decision to award $885.5 million to SpaceX for its unproven low Earth orbiting satellite business.

Ultimately, RDOF's success is defined by how effectively the FCC distributes Universal Service Funds to bridge the digital divide. Time will tell if they pulled it off.

The COVID pandemic exposed the vulnerability of those who lack access or the means to afford broadband services. The recently enacted American Rescue Plan Act included $20 billion to boost broadband availability and affordability. It provides up to $50 a month toward the cost of broadband for low-income households, telecom equipment for schools and libraries, and funding for critical capital projects to enable remote working and learning. Lastly, the administration's $2.3 trillion American Jobs Plan includes $100 billion to bridge the digital divide with funding prioritized for nonprofits, cooperatives, and local governments.

1 **Frustrations mount** as many **question the FCC's rationale** for allocating RDOF money to unproven business models.

2 **Execution risks are high** for some of the **smaller fixed wireless operators** that garnered a disproportionate amount of RDOF funding.

3 The **recently enacted American Rescue Plan Act** included valuable **funding for broadband availability and affordability in rural America.**

EXHIBIT 1: Highspeed Data Customer Additions

Company	Amount	States	Technology
LTD Broadband	$1,320,920,718	15	fiber and fixed wireless
Charter Communications	$1,222,613,870	24	fiber and cable
Rural Electric Cooperative Consortium	$1,104,395,953	22	fiber
SpaceX	$885,509,638	35	LEO satellites
Windstream	$522,888,779	18	DSL, fiber, fixed wireless
Nextlink	$429,228,072	12	fixed wireless
Frontier	$370,900,832	8	fiber and fixed wireless
Resound Networks	$310,681,608	7	fiber and fixed wireless
Starry	$268,851,315	9	fiber and fixed wireless
Century Link	$262,367,614	20	DSL and fiber
Total	$6,698,358,399		
Fixed Wireless $	$3,223,471,324		
Fixed Wireless %	**48%**		

Source: Company Reports

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.

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**CoBank's Knowledge Exchange Division welcomes readers' comments and suggestions.
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