



QUARTERLY U.S. RURAL ECONOMIC REVIEW, Q1-2014

Cautious Optimism Prevails

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...

In Transition.....2
Macroeconomic Outlook.....2
U.S. Agricultural Markets.....3
Grains, Oilseeds, and Ethanol.....3
Animal Protein and Dairy.....6
Other Commodities.....12
Farm Supply.....15
Rural Infrastructure18

Key Points:

- *Severe winter weather hampered growth in the U.S. economy in late 2013 and early 2014. Yet the medium-term U.S. economic outlook remains robust, with faster growth expected for the rest of 2014 and 2015.*
- *After three years of debate, Congress passed a new Farm Bill, and the President signed it on February 7. But now comes the USDA’s difficult task of translating legislative language into regulations.*
- *Record-high animal protein and dairy prices, volatile grain and oilseed prices, and steady to lower cropland values reflect agricultural markets in transition.*
- *Recent demand for U.S. grains has been exceptional, rendering a tighter domestic supply situation, even as global markets remain well stocked.*
- *Lower expectations for South American corn and soybean production contributed to the early 2014 price rally, and final harvest estimates for the region will continue to sway markets.*
- *Within the animal protein complex, strong export markets, constrained supplies of beef and pork, and less-than-expected consumer resistance to record high prices have boosted optimism about 2014 and 2015.*
- *The U.S. dairy market is transitioning from one of shortage to one of surplus. Milk production is increasing, sales have started to slow, and dairy product prices appear to have topped out and begun to recede.*
- *Drought conditions throughout California are expected to have ripple effects across all specialty crop sectors, affecting both supplies and prices for many commodities.*
- *How well natural gas storage operators are able to replenish their depleted inventories while meeting end-user demand will largely dictate natural gas and electricity prices through the rest of 2014.*
- *In response to faster broadband speeds, video-friendly devices and complementary software, all at affordable price points, the communications industry is running at a breakneck pace to implement new business models that will provide a solid footing in this changing marketplace.*

In Transition

Despite emerging economic weakness in China, turmoil in Ukraine, and severe winter weather in the U.S., the global economy appears to be gaining momentum. The prolonged recession has ended finally in Europe, and the impetus for global growth has shifted from China and the emerging markets to the developed economies.

The underlying growth momentum in the U.S. economy has been muted – and clouded – by the severe winter that has impaired consumer spending, construction, motor vehicle sales, inventory adjustments and industrial production. Yet the medium-term U.S. economic outlook still looks robust, with a pick-up in growth expected for the rest of 2014 and 2015. Indeed, reduced debt levels, rising home prices, and steady job and income growth in coming months should support a strong consumer rebound. U.S. monetary policy will remain accommodative even as the Federal Reserve continues to unwind its quantitative easing initiative, and fiscal policy will also remain accommodative with less fiscal drag and less political theatre since budget and debt ceiling agreements have already been reached. Against this backdrop, the U.S. economy is poised to resume its role as a major engine of growth for the global economy, with the U.S. dollar continuing to strengthen against the major traded currencies.

Record-high animal protein and dairy prices, lower grain and oilseed prices, and steady-to-lower cropland values reflect an agricultural market in transition. Net cash farm income will be sharply lower in 2014 but still be the fourth highest level on record. Building global inventories of grain, oilseeds and cotton will continue to press prices lower if the 2014/15 harvests reach their normal potential. Global trade flows, particularly to China, remain strong but vulnerable to any deterioration in global growth prospects. The animal protein and dairy sectors are enjoying a significant improvement in profit margins and aggressively rebuilding balance sheets. Continued strong U.S. consumer demand and growing export markets, particularly for dairy products, will be essential in sustaining margins in the face of potentially large production increases in late 2014 into 2015.

“*The impetus for global growth has shifted from China and the emerging markets to the developed economies.*”

Macroeconomic Outlook

Analysts remain cautiously optimistic that global economic growth will accelerate in 2014 despite recent weakness in China and the U.S. Whereas China and the emerging markets have driven the global economy in recent years, the impetus for the acceleration in growth in 2014 is expected to come from the advanced economies, particularly the U.S. and Europe. The recession in Europe has finally ended, and the combination of accommodative monetary policies and easing in fiscal drag should promote faster growth. However, there are several downside risks. Continuing concerns about the banking sector in the Euro zone and potential banking reforms will likely be a limiting factor. Geopolitical developments in Ukraine could undermine some of the growth potential. The early economic indicators for China are not encouraging, though some additional stimulus is likely to follow if growth declines below the 7 percent rate.

The U.S. economic recovery continues to gain traction, but the improvement is admittedly difficult to discern. Severe winter weather clearly hampered growth in the U.S. economy in late 2013 and early 2014 and lowered potential growth on a year-over-year (YoY) basis. It has also created difficulties in assessing the underlying growth momentum, with consumer spending, construction, motor vehicle sales, inventory adjustments and industrial production having all been curtailed. Real GDP growth in the first quarter will likely amount to an annual rate of 1.5 percent or less, albeit with the expectation that the economy will build momentum through the balance of the year. Reduced debt levels, rising home prices and steady job and income growth in coming months should support a strong consumer rebound. This will be particularly important for the animal

protein and dairy sectors which are enjoying record high prices. With budget and debt ceiling agreements in place, the political distractions that curtailed growth in 2013 should not be repeated until after the November elections, if then. Federal Reserve policy remains accommodative, and the tapering of quantitative easing has had minimal impact on interest rates.

U.S. Agricultural Markets

After nearly three years of debate, Congress passed a new Farm Bill, and the President signed it on February 7. The process of translating legislative language into regulations is now underway at the U.S. Department of Agriculture. This Farm Bill ends the traditional direct farm payment programs and allows farmers to choose between price protection programs and revenue insurance programs for the next five years. The dairy program shifts from a price support program to a margin insurance program. Assessing the overall impacts of this new farm bill must await the completion of the regulatory process. With a farm bill containing significant shifts in programs, the devil is always in the details, and the process of converting legislative intent into regulatory authorities will take time. Farmers may actually have until early 2015 before they must make their decisions, and only then will the impacts of those decisions become known.

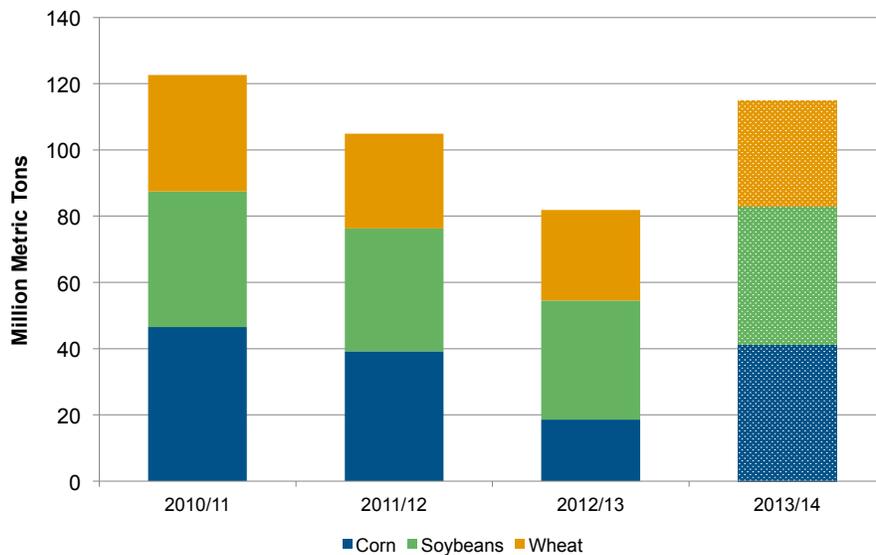
In recent months, the agricultural markets have been focused on headline news events regarding China, Ukraine, the porcine epidemic diarrhea virus (PEDv) and the severity and duration of the winter. But going forward, the markets will become increasingly focused on acreage shifts for the 2014/15 crops as the planting season gets underway. While the large 2013/14 grain harvest pushed prices moderately lower, grain stocks remain low by historical standards. However, if USDA's initial 2014 acreage estimates prove accurate, and yields return to trend, inventories will build further in 2014/15. Large global supplies on the oilseed side could become a depressing factor if China slows its purchases or U.S. soybean production swells to a record high, as expected. Global cotton inventories are at record levels, but are stockpiled mostly in China. How China manages

those inventories in the face of larger 2014/15 crops will be a significant price factor. The crops sector will face increasing cost pressures as declines in input prices and land rental rates lag behind the market transition to lower price expectations for row crops.

The animal protein and dairy sectors are enjoying significant improvements in their profit margins and are aggressively rebuilding balance sheets after the stress of record high feed costs over the past several years. Strong export markets and less-than-expected consumer resistance to record high prices have boosted optimism about 2014 and 2015. The dairy sector in particular is riding a wave of export growth that may be difficult to sustain going forward. Typically, such sharply improved margins would spur substantial gains in production, but this time around, the increases have been tempered by the lowest cattle inventory since the early 1950s, a cautious expansion from the broiler industry and continued uncertainty over the impacts of PEDv on future pork output. However, as the 2014/15 crop potential comes into focus, the rate of expansion in the animal protein and dairy sectors could accelerate rapidly and introduce a new market dynamic.

Grains, Oilseeds, and Ethanol

Recent demand for U.S. grains has been exceptional, rendering a tighter domestic supply situation, even as global markets remain well stocked. This has boosted prices across the complex, but also significantly reduced carry in the corn and wheat markets, and intensified the inversion in the soybean market. The weakening contract spreads will negatively impact elevator operators, but increased farmer selling, and thus increased elevator ownership, will partially offset the spread weakness. Lower expectations for South American corn and soybean production further contributed to the early 2014 price rally, and final harvest estimates for the region will continue to sway markets. As U.S. exports continue to slow, however, markets will increasingly look to U.S. spring weather for direction. (See *Figure 1.*)

Figure 1. U.S. Grain Exports

Source: USDA-FAS

Corn

The winter months are typically pretty quiet for the grain markets. In 2014, they have been anything but. Many producers shrugged off sale offers as prices dropped to near \$4.00 in January. Farmers' reluctance to sell in turn lifted basis levels around the grain belt to historical highs. Meanwhile, export and feed demand continued to surprise to the upside, even as it was becoming clear that Brazil and Argentina will disappoint in their corn production. The result was a slow, yet persistent, 20-plus percent rally in nearby futures. As prices ratcheted higher, producers seized the opportunity to market the crop in the bin, as well as a portion of the yet-to-be-planted 2014 crop. The sudden increase in selling sent basis tumbling in many locations, trimming the benefit to farmers making cash sales.

The corn market has also added in some expectation that Ukraine and Argentina (the world's third and fourth largest corn exporters) will sell less corn this year than originally thought. Argentinian farmers are holding their grain as a hedge against the drastic currency devaluation there, and orders for Ukrainian grain are expected to remain lower than usual as buyers shy away from political risk.

U.S. livestock and poultry producers also fed more corn than expected through the winter months, in part because of the spread of high meat prices and relatively low corn price. But Mother Nature encouraged even more animal feeding by ushering in the coldest winter temperatures in three decades.

As the spring planting season gets under way, the market will have plenty of information to trade on, both domestically and globally, which is likely to keep prices volatile. The USDA's initial report on crop acreage indicated that 91.7 million acres of corn are expected to be planted in 2014, down 4

percent YoY and the fewest acres planted to corn since 2010. The key factors that will influence price direction will be the size of Brazil's *safrinha* corn crop, political developments in Ukraine and Russia, export activity, and spring conditions which influence the timing and early expectations for the 2014 crop.

The impressive rally in corn prices seems justified by the change in consumption estimates and a projected smaller carryout. The USDA's Q1 stocks report further confirmed the market's tightening expectations. However, we expect that it would take a significant deterioration in U.S. growing conditions, or some unforeseen shakeup in the global demand or ethanol picture to increase and sustain prices well above the \$5.00/bu threshold into the summer months. Significant downward revisions to the carryover, though, have lifted the price floor for the remainder of the season. Since the beginning of the marketing year, USDA's export estimates for 2013/14 have risen 33 percent and the estimated ending stocks have fallen over 20 percent. Barring an unforeseen reversal, 2013/14 prices are unlikely to fall below \$4.30/bu for a sustained period of time.

Soybeans

The soybean sector has experienced a similar, albeit less dramatic, surge in demand and prices. The USDA's projected volume of exports is 13 percent higher than it was in September, and nearby futures rallied 12 percent from late January to mid-March. China's orders for U.S. soybeans have surpassed all expectations, despite the ongoing harvest of a record crop in South America. Having experienced significant delays in Brazilian soybean shipments last year, China changed its sourcing strategy in 2013/14 by frontloading its orders from the U.S. China has bought so many soybeans in the first half of the marketing year in fact, that it now has stockpiled more than ample supplies, and is attempting to resell or cancel several Brazilian shipments before they leave Brazil's ports. Some of these shipments, ironically, are likely to be redirected to the U.S. for delivery this summer, to shore up its increasingly tight supplies.

“The winter months are typically pretty quiet for the grain markets. In 2014, they have been anything but.”

China's negative crush margin and now abundant supplies have signaled the sudden shift in appetite, which likely has formed a near term peak in prices. Significantly cheaper South American supplies will weigh on the market, absorbing most of the export demand for the remainder of the marketing year.

Major declines in domestic biodiesel production will also contribute to setting a ceiling on prices through the summer months. Due to the loss of the biodiesel blender's credit in December 2013, U.S. biodiesel production is projected to fall 16 percent YoY in the first half of 2014.

U.S. planting and early growing conditions soon will quickly take center stage for the markets. Despite the recent price volatility, the soybean/corn price ratio

for the 2014 crop has remained surprisingly stable since January, holding between 2.4 and 2.5. While the 2014/15 ratio is much lower than that of the 2013/14 crop, it will likely be enough to prompt producers to plant a record 80-plus million acres to soybeans. The USDA's initial estimates peg 2014 U.S. soybean plantings at 81.5 million acres, a 1 percent YoY increase.

Over the next few months, prices will be most impacted by USDA's acreage and crop progress reports, China order cancellations, and the volume of U.S. imports from Brazil. The limited U.S. supplies will ensure that inverses in the market remain steep, encouraging old crop sales in the near term, rather than in the summer months. Barring the development of poor U.S. growing conditions, soybean prices will likely fluctuate below recent highs, within a range of \$13.20 and \$14.70. The building of supplies domestically and globally, however, is setting up 2014/15 to be much more bearish.

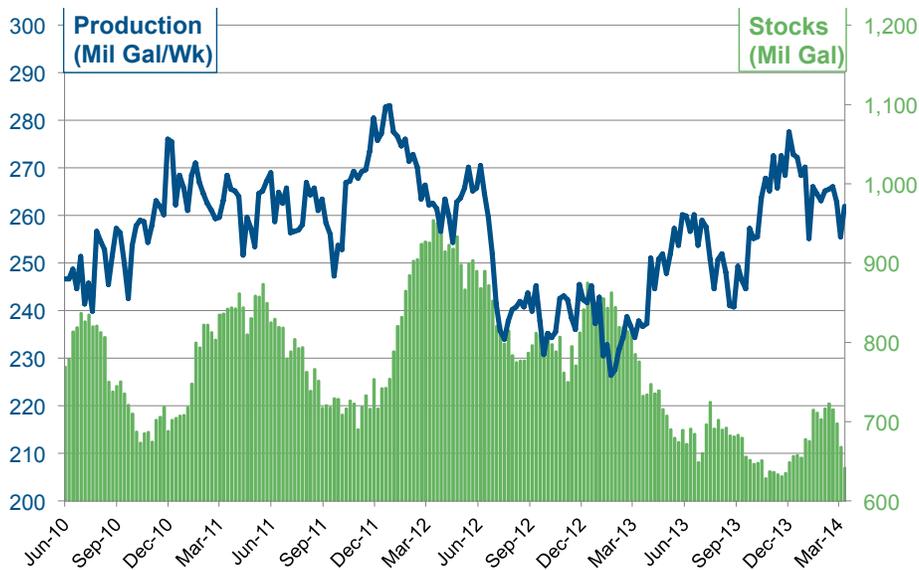
Wheat

Wheat has followed the same domestic trends of strong exports and tightening supplies. Since the start of the marketing year last June, USDA export estimates have climbed 21 percent and ending stock estimates have fallen 15 percent. Global wheat production and trade will set new records this year, thanks in large part to the EU's record high wheat exports in 2013/14, up more than 50 percent YoY.

Supplies of most classes of U.S. wheat are more than adequate, with the exception of hard red winter wheat (HRW). HRW production typically makes up about 40 percent of total U.S. output, and after drought reduced the crop size by 25 percent in 2013, stocks have been cut nearly in half versus a year ago. Despite the reduced crop and higher prices, HRW exports are expected to be up 18 percent this year.

World demand will now shift to less expensive origins for the remainder of the marketing year, but persistent drought conditions will keep the market's attention squarely on the Southern Plains. The 2014/15 HRW crop has emerged from dormancy, but has received limited precipitation across Texas, Oklahoma, and Kansas.

Figure 2. U.S. Ethanol Production and Stocks



Source: U.S. EIA

Spring rains could still deliver an abundant crop, but until the crop's size and quality become clearer, prices are likely to be volatile. Drought conditions have also become serious in Western Australia, the largest production area in the country. The degree to which drought persists in the U.S. and Australia will have an impact on markets. Chicago wheat futures soared 26 percent from late January through mid-March, so a risk premium was certainly added to the market. Therefore, to push wheat markets to new highs would require an intensifying U.S. drought situation in the southern Plains. Barring an escalation in drought conditions, Chicago wheat is likely to trade in the range of \$6.30 - \$7.30 in the coming quarter, and the premium for HRW is expected to remain above 50 cents.

Ethanol

Conditions for ethanol profitability in the first quarter of 2014 shaped up to be the most favorable in years. Ethanol production and inventories remained below expected levels, narrowing the price spread between ethanol and gasoline. (See Figure 2.) Rail disruptions created ethanol shortages, particularly on the east coast, helping to lift ethanol prices to the highest level since 2006 and above the price of gasoline in nearby futures. Corn prices

increased, but not enough to offset the gains in distillers grains prices, which continue to be priced at near record levels in relation to corn and soybean meal. Ethanol exports in January also rose to the highest level in over two years, as drought conditions in Brazil's sugarcane growing areas prompted a sudden boost in overseas orders. Ethanol producer margins have been excellent, exceeding \$0.50 per gallon in most cases, and surpassing \$1.00 per gallon for the most efficient producers.

Plant production is still expected to rise through the second quarter, which will lift stocks, lower prices, and trim plant margins. The nearly

50 percent gain in ethanol prices from January to March has already quelled export interest, and export orders going into the summer will remain subdued. Average plant margins will remain in the black through the second quarter, but below the lofty levels of Q1. The futures market is steeply inverted through the summer and beyond, signaling that ethanol prices will be cut in half by the start of 2015.

In Q2-2014, the EPA is still expected to pass a final ruling on the RFS proposal announced in November of last year. If the proposal to reduce 2014 corn ethanol blending requirements to 13 billion gallons is upheld, it will send a bearish tone through the market. Nevertheless, the ruling will have little direct short-term impact on the industry, with the exception of a near term decline in prices. The longer-term impact would result from a lack of incentive to invest in the infrastructure needed to dispense higher ethanol blends.

Animal Protein

PEDv continues to cast a cloud of uncertainty across all animal protein industries. Constrained supplies in the beef and pork sectors have driven prices up to near record

highs, demand remains stable for beef and pork, while poultry demand lags despite relatively cheaper prices.

Beef

After multiple years of forced herd reduction, the beef sector remains poised to begin herd rebuilding throughout 2014. However, heifers retained in late 2013 and early 2014 will not impact beef production until late 2016, leading to continued beef supply constraints and record high prices across the beef supply chain through 2014.

Easing drought conditions across most major cattle grazing regions, lower feed prices, and record cow/calf prices are painting the perfect picture for increased heifer retention through 2014. Given the push to rebuild herd numbers, record profits are expected in the cow/calf sector through the first half of 2014, thanks to high calf and replacement cow prices. The only cow/calf and stocker operations not reaping record profits are those in California. Drought conditions there have left cattle grazing regions parched, forcing many operations to liquidate cows in Q1 with more liquidations expected in Q2. If the drought persists, California could transfer as many as 100,000 head of cattle out of state in 2014, reducing the state's herd by 15 percent or more.

“*PEDv continues to cast a cloud of uncertainty across all animal protein industries.*”

Feedlots have posted the strongest earnings in three years in Q1, averaging 5 to 10 percent above breakeven levels in mid-March. Margins have remained positive due to lower feed costs and the fact that feeder prices have ratcheted-up at a slower pace than those of fed cattle. March fed cattle prices are averaging in the upper \$140s per hundred weight (cwt), up 15 percent YoY. Near record high feeder and fed cattle prices are expected to continue through Q2/Q3 given constrained supplies.

Cattle on feed numbers for March slipped 1 percent YoY to 10.8 million head. Cattle feeding margins are expected to recede toward breakeven as summer approaches, marking a seasonal decline in feeder margins. However, feeder margins are not expected to experience losses as large as those seen during recent summer slumps.

Packer margins were volatile in Q1, due to supply shortages. Margins fluctuated from highs of \$150/head in January to levels that indicate financial losses in February. Plant shutdowns and high fed cattle prices have created some market uncertainty for packers, but processors managed to regain profitability in the latter part of Q1. Packer margins are highly seasonal, and Q1 normally posts tight margins. However, March margins are expected to be up 30 percent YoY, translating to a \$30-35/head profit. Margins are expected to remain above year ago levels through the traditionally strong summer months due to robust consumer grilling demand and seasonally higher fed cattle supplies.

Cattle slaughter waned in Q1, and YoY declines are expected to continue into Q2. Challenging winter weather, which constrained cattle transports, and tight fed cattle supplies led to a 7.5 percent decline in Q1 slaughter. Year to date, steer slaughter rates are down 5 percent, while heifer and cow slaughter is down 9 percent YoY. Average slaughter weights continue to make up for some of the decreases in slaughter numbers, with Q1 weights averaging 795 pounds or 2 percent higher than a year ago. With the recent announcement of National Beef's Brawley plant shutdown, the packer sector is slowly reaching an equilibrium level in terms of slaughter capacity. Future declines in slaughter rates will be met with additional shutdowns in Saturday processing, and maybe one more major plant closure yet this calendar year.

Total beef production decreased 5 percent YoY to 5.8 billion pounds in Q1. Beef production is expected to remain below a year ago for the next two years, but will gain seasonally into the summer months. Cold storage supplies of beef also remain tight, down 17 percent YoY in February, and decreasing 5 percent from January. With constrained beef supplies, wholesale prices (choice boxed beef values) have been well above 2013 levels,

with year to date prices (January-March) averaging \$2.26 per pound, well above \$1.89 per pound during the same period in 2013. Prices are expected to remain elevated through the high demand summer months, given constrained beef supplies.

Industry analysts are concerned that consumer demand will falter as beef prices rise, but so far it has held up surprisingly well. Its resilience is due in part to high pork and poultry prices, improved economic climate and increasing consumer income, and consumer awareness that high beef prices are not a short-term phenomenon. As long as meat prices remain high across all three major meat sectors, and the U.S. economy continues to grow at its current pace, consumer demand for beef should remain at least stable through Q3 and into Q4.

Foreign demand for U.S. beef continues to remain robust, despite high prices. U.S. beef exports were up 5 percent YoY in January, with exports totaling 9 percent of U.S. beef production. Although most January exports were contracted in 2013, the impact of the recent high beef prices won't be realized until late Q1 and into Q2. However, beef supplies remain tight in our top export markets, especially in Mexico, so overseas demand is

expected to remain strong for U.S. beef in coming months as long as beef prices do not increase too quickly.

Pork

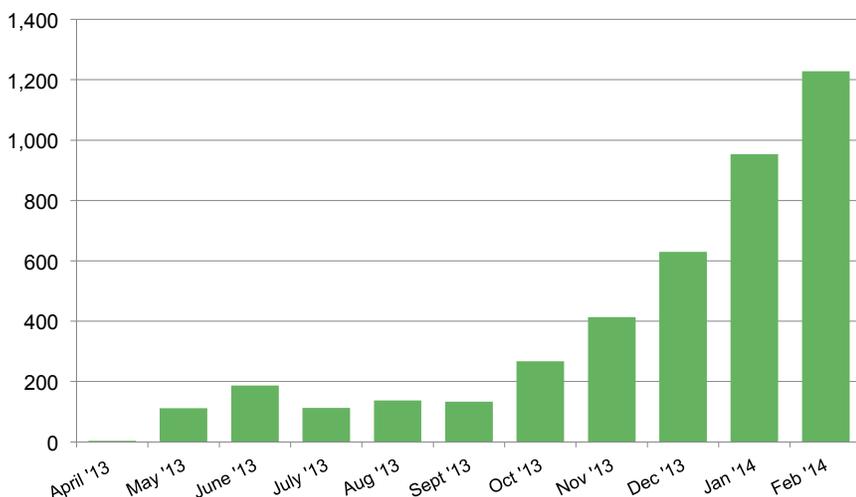
PEDv continues to rock the pork industry. The number of reported PEDv cases increased in January and February, and will result in drastically reduced slaughter numbers in July and August. (See Figure 3.) Industry estimates suggest that as much as 50-60 percent of the sow herd has experienced at least one outbreak. PEDv outbreaks have significantly increased in winter months as the virus thrives better in colder temperatures and closed barns. A vaccine has yet to be discovered, pushing producers in infected regions to intentionally infect barns in the hopes of building resistance among sows for subsequent farrowings.

Since the initial outbreak in April 2013, roughly 5 million pigs have been lost – with 1.3 million piglets being lost to the disease in January alone. The USDA's latest quarterly Hog and Pig survey reported that the total number of hogs and pigs fell 3 percent YoY to 62.9 million head on March 1, 2014, down 5 percent from December 1, 2013, and the lowest inventory since 2007. Despite the high losses, if producers have hogs to sell, lean hog prices

are more than making up for producer losses, averaging over \$100 per cwt in March. Hog prices are expected to increase through Q2 as slaughter supplies remain limited.

Slaughter rates steadily declined in Q1, while higher slaughter weights partially offset the volume declines. Year-to-date (January-March) pork slaughter rates are down 11 percent YoY, on average. Slaughter rates are expected to stay below 2013 levels, and significantly decline in Q2/Q3 due to PEDv impacts when Dec.-Feb. farrowings will reach slaughter maturity. In an attempt to make up for lower slaughter numbers, pork processors have allowed growers to feed hogs longer to increase weights.

Figure 3. Number of New PEDv Cases By Month



Source: American Association of Swine Veterinarians

Pork live weights have averaged 2 percent higher YoY in Q1 at around 284 pounds. Live weights are expected to trend higher through Q2 and seasonally decline in Q3 when warmer weather impacts hog productivity. Total pork production for Q1 increased slightly by 2 percent YoY, thanks to higher slaughter weights. However, pork production in Q2/Q3 is expected to slow and remain slightly above YoY levels due to increased PEDv production losses.

Tight processing supplies and strong demand have widened packers' gross margins to record highs in March. Although lower slaughter numbers impair a processing plant's ability to maximize their economies of scale, high wholesale cut prices lifted packer per head margins above 2013 levels by about 35 percent. Increases in hog prices and operating costs are expected to eat into packer margins in Q2/Q3. However, margins are expected to remain well within the black through the summer months. In anticipation of Q2/Q3 declines in hogs available for slaughter, packers are expected to eliminate Saturday slaughter; however, many plants are constrained on the number of slaughter days they can eliminate due to labor agreements mandating that plants must run a minimum of 32 hours per week.

Mirroring the beef sector, retail pork prices continue to increase, and consumers persistently maintain demand. Year-to-date retail pork prices averaged \$3.74 per pound, a 79 percent increase from the same period in 2013. As long as real consumer disposable income remains at least stable, and the prices of competing proteins remain high, consumer demand is expected to remain relatively unchanged YoY at least throughout Q2.

Foreign demand for U.S. pork remains sound despite higher prices. January pork exports increased 4 percent YoY, fueled by strong demand from Japan, Mexico and China. Exports to Japan, traditionally the largest overseas market, constituted 26 percent of total January pork exports, while Mexico rose to 28 percent. Mexican consumers are more price sensitive than those in the U.S. and there clearly has been substitution of less expensive imported pork items for beef in that country. Exports to China increased 54 percent YoY due to easing

import restrictions and some U.S. producers complying with ractopamine free pork production. If U.S. pork prices continue to increase as expected in Q2/Q3, it remains to be seen whether foreign demand will be as resilient as domestic demand.

Poultry

The broiler sector exercised moderate restraint in production growth in Q1. Anemic chick placements, high soybean meal costs, and soft consumer demand have led the broiler industry to slow its expansion, with expectations that broiler production will grow only 2 percent in 2014.

The lower than initially expected increase in 2014 poultry production is due, in part, to a recent slowdown in the number of chicks placed for grow out. Year-to-date chick placements have increased only 0.2 percent, compared to 2013. One culprit is the decline in broiler hatchability. Hatchability in Q1 has lagged well below 2013 levels, hovering around 83 percent of eggs hatching. The hatchability issues are due to cold winter weather, livability issues with some of the major genetic lines and older hens laying fewer viable eggs. Due to declining chick placements in late 2013 and early 2014, Q1 broiler production is only expected to increase by 1 percent YoY. However, production is expected to pick up to 2 percent growth in Q2, thanks to warmer weather.

Slaughter rates declined in Q1 as processors were impacted by the poor weather and slowing production. Weights, however, continue to trend higher, partly making up for the slowdown of available birds for slaughter. Broiler liveweights averaged 5.9 pounds in Q1, and weights are expected to trend well above 2013 in Q2, signaling increased production of big birds. Higher average weights should lead to a 1 percent YoY increase in total broiler production during the first half of 2014. Chicken stocks have also been building, with total chicken in cold storage increasing 4 percent YoY in February. With higher broiler meat production expected in Q1/Q2 and an increase in stocks, coupled with steady consumer demand for pork and beef, softer than expected demand for chicken is expected to put downward pressure on prices for the first half of 2014.

Chicken prices for most cuts remained softer than anticipated in Q1 and are expected to trend lower after the seasonal summer peak. Prices for breast meat averaged in the low \$1.20s per pound in Q1, well below the mid \$1.30s per pound seen in Q1 2013. Breast meat is expected to reach summer highs of \$1.60 per pound in 2014. Prices for leg quarters found a bottom in Q1, after falling steadily since late 2012. Firm export demand kept leg quarters hovering around \$0.42 per pound in Q1, and prices are expected to rise slightly with seasonal highs in Q2. Overall, broiler processor margins are expected to remain fairly positive through Q2, as long as prices for soybean meal continue to drop and consumer demand does not soften too much.

Despite weaker than expected domestic demand, export demand for chicken remained strong in early 2014. Broiler exports increased 16 percent YoY in January. If China's consumers turn away from chicken as they have at times in the past due to the recent problems with Avian Influenza, China's demand for U.S. chicken could be dampened in coming months. The recent outbreak has spurred the culling of hundreds of thousands of birds and caused \$3.2 billion of losses in January alone. Past outbreaks in China have soured Chinese consumer demand for poultry, and this outbreak is no different with reports of 20-30 percent drops in poultry demand in February and March.

Turkey markets continue to maintain their rollercoaster ride. Poultry placements are on the rise, which will lift total production starting in Q3. Slaughter rates in Q1 were lower YoY, reflecting lower production in the last few months of 2013. Slightly higher liveweights of 32 pounds per bird in Q1 moved some pressure off of decreased slaughter but was not enough to keep Q1 production from falling 6 percent YoY. Slaughter is expected to ramp up as production increases through the summer months and demand for deli meat picks up.

Continued uncertainty regarding pork production and PEDv, reduced cattle slaughter – especially cows which provide hamburger and manufactured beef items like hot dogs – as well as decreased turkey production have pushed turkey prices higher in Q1. Turkey breast meat has been averaging \$2.60 per pound in Q1, well over the

\$1.40s posted in 2013. Breast meat prices are expected to increase through Q2/Q3 due to high seasonal demand for deli meat. Turkey thigh meat has also experienced strong prices, averaging \$1.50-1.55 per pound, thanks in part to good export demand from Mexico. Export sales to Mexico show no sign of slowing, so exports could maintain the current pace through the summer months. Total U.S. turkey exports were down slightly YoY, as a result of higher prices. However, high prices for competing meats should keep turkey exports steady through 2014.

Dairy Industry

For much of 2013, milk powders stole the dairy market headlines. So far this year, it has been the cheese market's turn to capture attention. The climb to higher prices was swift. From January 1 until February 1, 40-pound cheese blocks at the CME rallied from \$2.02 per pound to a record high of \$2.36. They stayed there just three days. But after falling back into the \$2.10-range, the cheese market caught a second wind, establishing a new record at \$2.42 on March 19.

Unlike powder stories where plotlines are almost exclusively international, the cheese market tale has a more domestic flavor. To a large extent, Idaho appears to be ground zero. Milk production there has fallen short of expectations, where for most of the second half of 2013, output lagged prior year levels. While Idaho's production has picked up of late, it still is below what most analysts would expect given current prices and economics. Cow numbers there are down 11,000 head YoY (compared to gains of 1,000 in California and 3,000 in Michigan). In short, it is difficult to make more milk if the cow herd isn't big enough.

The Idaho situation extends beyond the farm. Over the past five years, new plant investment has created increased competition for milk. With Class IV prices topping Class III, milk has been pulled from cheese vats. With flat milk production and increased yogurt and Class IV capacity, cheese plants have been the ones caught short. Moreover, cheese plants in the state have been making less commodity cheddar – the product that matters in the price discovery arena.

Figure 4. U.S. All Milk Price

Source: U.S. Department of Agriculture.

Adding further support for cheese prices is a sustained bid from the world market. Export demand remains robust, with U.S. cheese exports reaching a new all-time high in January at 70.8 million pounds. Consequently, Gouda and white cheese production levels have been raised in order to meet this demand. While not just an “Idaho problem,” the net effect is less cheddar with manufacturers positioning themselves to serve the international buyer.

As cheese prices soared, powder prices have plateaued or even, by some measures, lost some ground. Depending on the metric, U.S. prices near the end of the first quarter were not that different from those that prevailed when the year began. Reported USDA prices for the Central States moved just \$0.04 higher, leveling off near \$2.11 per pound. At quarter-end, survey prices were about the same, with the National Dairy Products Sales Report’s weighted average price gaining about \$0.07 from January’s \$2.03 average.

International markets have softened. European skim milk powder prices have slipped 2.6 percent since January and now are on par with U.S. values for the first time since December. In addition, whole milk powder is also down 1.5 percent. Prices in New Zealand followed suit.

On the GlobalDairyTrade (GDT) bi-monthly auction, the price of skim milk powder slipped 2.2 percent while the price of whole milk powder fell 10 percent.

Meanwhile, the butter market has lingered somewhere in between. Butter prices have rallied to be sure, with spot values at the CME now hovering around \$1.90 per pound, up \$0.20 since the start of the year. Exports remain an on-going theme, given about a 30-cent price gap between the U.S. and prevailing world markets.

► Markets with Benefits

While end-users lament the current high prices, producers couldn’t be more pleased. Dairy farmers worldwide are realizing some of their highest all-time returns. In the U.S., the all-milk price

averaged \$24.70 per hundredweight in February, beating the previous record by \$1.20. (See Figure 4.) And with the underlying commodity markets moving higher since then, the March and April numbers seem poised to ratchet still higher. The U.S. all-milk price has exceeded the \$20 mark for the past six months.

At the same time, dairy producers have also been realizing benefits on the cost side of their ledgers. Despite some firming in the grain complex of late, feed costs have plummeted relative to previous years. Using a representative ration, U.S. dairy feed costs are averaging \$9.00 per hundredweight, well below the \$11.00 average in 2013. This lower cost basis should insulate producers from any correction in milk prices for the foreseeable future, and dairy producers probably won’t be worrying about margin pressures until late in the year, at the earliest.

► Riding a Global Tidal Wave

U.S. dairy producers are making money today at a pace never seen before. However, those dollars are beginning to stimulate more supply. Western and southwestern dairies that used to stand empty are being repopulated. Greenfield construction is underway in some regions, and

expansion projects are moving hurriedly from concept to reality. Culling has slowed to a pace not seen in five years, and higher margins are encouraging producers to boost feed quality and ingredients to maximize milk per cow. Unsurprisingly, February milk production topped year-ago levels by 1.1 percent (the largest YoY gain since October). Dairy farmers are just getting started on rebuilding their herds, however, as cow numbers were steady month-to-month and still 12,000 head below last year.

New Zealand output quietly remains strong, with production through January up 6 percent on a season-to-date basis. Some well-timed rains in March kept pastures green enough to hold more cows in milk later in the season than just one year ago. Stockpiles of feed from earlier in the season should also help bolster milk production as the season begins to wind down.

► Not Quite Enough

Despite the rosy supply-side outlook, surplus product is currently hard to find. Exports have played a role here so far, with any excess easily placed into the world market. Such placements were much easier, however, when U.S. prices were at a significant discount to Europe and Oceania. Now, with that pricing advantage all but gone, it remains to be seen how much new business will come to the U.S. when both Europe and New Zealand have product to offer.

Higher prices are curbing domestic demand too. Cheese, milk and other dairy products are being moved to higher grocery store shelves as promotions and trade spend are being cut. It just doesn't pay to promote cheese with the wholesale price hovering near \$2.50 per pound. Fluid milk prices are also creeping higher, as manufacturers tie their selling price back to the monthly USDA price. And, when fluid milk prices climb to current levels on a per gallon basis, it's not surprising to see a large swath of consumers back away, with declining sales the result.

► Where To From Here?

The data point increasingly to a market moving from one of shortage to one of surplus. Milk production is moving higher, and sales have started to slow. With whole milk powder prices – the leading indicator for global markets – down

about 10 percent YoY in the first quarter, it seems safe to say that the bull-run has come to an end. Anecdotally, slower offtakes from Asia are a commonly cited cause. Either China's needs have been met, at least for now, or potential buyers have moved to the sidelines waiting for lower prices before restocking.

In any event, "uncommitted" product is starting to emerge and will be used to rebuild depleted inventories. If buyers have enough of what they need with no desire to buy any more at current prices, then it will just take a little excess to quickly pressure prices lower.

However, there are still concerns. While recent rains have eased the situation a bit, California's drought will limit local forage availability later this year. As producers reach beyond the state to find feed, their costs will go up and those high margins will start to erode. It could easily take until late 2014 before those impacts affect milk production, but it is a concern for producers and end-users alike. Also, the persistent cold and snow across the Midwest and Northeast could mute the usual "spring flush."

Other Commodities

Rice

For growers that chose to plant rice in 2013/14, it has been a very profitable year. Total U.S. acres planted to rice in 2013/14 were the smallest since 1987, but yields were record high. Aided by elevated prices for other grains, a decline in rice production of 5 percent, and marginally higher domestic use YoY, season average farm prices are expected to end up 9 percent, at \$16.50 per hundredweight. In particular, California medium and small grain prices have risen substantially on concerns about 2014 acreage declines due to ongoing drought conditions. In the two months since late January, California rice prices have rallied 35 percent, marking the most rapid increase in rice prices since the spike in 2008. U.S. prices have also been buoyed by an improvement in overseas demand. Vietnam has been engaged in a temporary stockpiling program, and the Philippines has recently bought large volumes of rice in government-to-government deals.

Looking ahead to the 2014/15 crop, U.S. rice acres are expected to bounce back from the lowest level in 36 years. The increase in rice prices and decline in prices for competing crops should bring about 500,000 acres back into rice production in the Mid-South. All of the additional acres will be in long grain rice, boosting long grain acreage by about 25 percent. Persistent drought conditions in California, however, are expected to slash medium and short grain rice plantings there by 20 percent.

If average yield comes back in line with trend this year, however, it will decline by roughly 3.5 percent versus last year. This would curtail the rebuilding of supplies, allowing stocks to build only marginally. Average prices are forecast to slide in 2014/15 by about \$0.70 per hundredweight to \$15.80. A reduction in prices and larger supplies will induce more sales both domestically and internationally, with both domestic and export sales projected to rise 4 percent. The 2014/15 world rice situation is expected to remain largely the same, with stocks-to-use ending flat compared to the current season, at around 23 percent.

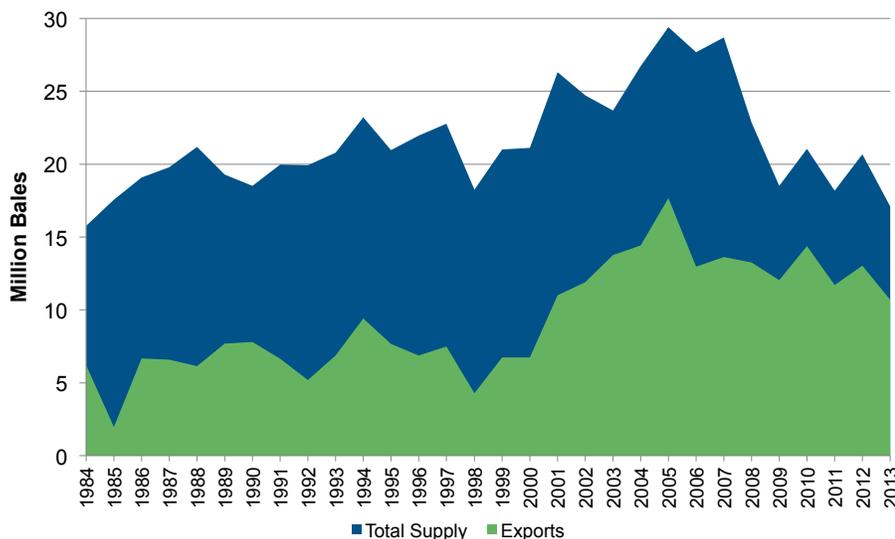
Cotton

The U.S. cotton market in 2013/14 has been defined by tight supplies and a steady, significant rise in prices. Current marketing year (August-July) exports will fall to the lowest level since 2000/01, but taking into account that domestic supplies are the smallest in 30 years, sales to overseas buyers have been quite strong. (See *Figure 5.*) As a result, U.S. ending stocks are also forecast to fall to the lowest level since 2000/01.

The multi-decade low in supplies, in combination with a resurgence in speculative buying, has pushed prices much higher through the marketing year. Nearby futures rallied 25 percent from November to mid-March to exceed \$0.93, and prices are expected to remain elevated in the near term as the market rations the remaining inventory. Trading could become quite volatile in coming months as the market digests acreage reports, weather, and crop conditions reports. Barring serious drought conditions and exceptionally high abandonment in Texas this summer, downside price risk is significant for the second half of 2014.

The USDA's initial estimates indicate that growers are expected to add 700,000 acres, or 7 percent, to planted area in 2014. Most of these additional acres will be planted in Texas; and thus, a commensurate increase in production would assume an improvement in drought conditions there and far fewer abandonments than last year. With much larger supplies expected to come online by the fall, and fewer export sales in 2014/15, the domestic stocks-to-use ratio could climb from 21 percent in 2013/14 to as much as 35 percent in 2014/15. The discount of polyester to cotton has been steadily widening since 2011, and now rests at about \$0.80 per pound. The elevated cotton prices have turned mills away from using cotton, so as the rally intensified, the Asian yarn market

Figure 5. U.S. Cotton Supply and Exports



Source: USDA-FAS

has weakened. Heading into the final few months of the marketing year, the price inversion of about \$0.11 per pound between old crop and the 2014 crop will continue to slow export sales and incentivize cancellations or deferrals to the new crop year.

China, which still holds 60 percent of the world's cotton stocks, is estimated to cut its imports in 2013/14 by half YoY. China is likely to reduce its imports by another 10 percent in 2014/15, as it aims to shrink its record-large stockpile. World supplies and consumption are expected to rise marginally in 2014/15, keeping global stocks-to-use flat, around 19 percent.

Sugar

The world sugar surplus (i.e., production minus use), which reached record levels in 2012 and declined slightly in 2013, is estimated to fall 44 percent this year. But the record large carryover into 2013/14 has kept supplies high and prevented the stocks-to-use ratio from declining. Producers around the world will have a better start in 2014/15 due to the smaller carryover, but it remains to be seen if growers will respond to price signals and curtail production.

Similarly, 2013/14 sugar production slipped in the U.S., but huge carryovers from 2012/13 weighed on the domestic market. There's still good reason for optimism in the U.S. sugar industry, however. Since the start of the U.S. sugar marketing year in October, the USDA has made wholesale revisions to their domestic supply and demand estimates. On the one hand, beginning stocks, production, and imports have all been cut for the current year, reducing supply estimates. On the other hand, exports and domestic use have both been raised, lifting total use. The result is a dramatic reversal in projected market dynamics. The estimated domestic stocks-to-use ratio for 2013/14 declined from 20 percent in November to 13.6 percent in March. These revisions mean that the carryover from 2013/14 to 2014/15 is projected to be the smallest in three years, which will help narrow the gap between supply and use in the upcoming crop year.

Domestic sugar futures rallied 10 percent from their lows in December to late March, while the world price rose only 6 percent over the same period. The spread between

the two prices, therefore, expanded to \$0.05 per pound, doubling the gap from last summer. Going forward, U.S. sugar prices have only limited upside potential, as long as the global sugar market remains oversupplied. The USDA currently expects domestic sugar beet plantings to decline 4 percent in 2014 to the lowest level since 2008.

The greatest difficulty for the U.S. sugar industry remains balancing domestic production with the variability of imports from Mexico. Variability aside, the consensus is that imports from Mexico will trend upwards beyond 2013/14. Mexican sugar production expanded significantly after 2011, while sugar consumption is expected to decline going forward, freeing up plenty of sugar for export. Corn syrup production is on the rise, and is successfully competing for a share of the Mexican sweetener market. In addition, under the North American Free Trade Agreement, sugar can be exported from Mexico to the U.S. unrestricted by tariffs or other barriers. Therefore, the U.S. sugar policy which was called upon to backstop industry losses in 2013, may have to be utilized again in coming years.

Specialty Crops

With the start of the major growing season for specialty crops across the country, drought conditions throughout California are expected to have ripple effects across all specialty crop sectors, affecting both supplies and prices for many commodities.

California is currently entering its third consecutive year of drought. Water constraints throughout the state are expected to have major impacts on fruit and vegetable production in 2014. Despite recent rains throughout the state, snowpack in California is averaging 28 percent of normal, and most major reservoirs remain well below historical averages. With spring plantings around the corner, little to no surface water allocations, and diminished groundwater supplies in many areas of California, growers expect to fallow up to 600,000 acres of annual row crop production, primarily in the Central Valley. Crops that are expected to be hit particularly hard include broccoli, cantaloupe and leafy greens. Fallow acreage is expected to constrain supplies of some fruits and vegetables, as well as increase prices through 2014.

Drought conditions are expected to impact tree nut production throughout California's Central Valley. Warm temperatures spurred an early 2014 bloom for almonds, with growers reporting ample bee flight hours throughout most of the bloom period. Despite the strong bloom, the California drought is expected to impact yields in 2014. High commodity prices have incentivized growers to keep older orchards in production over the past few years; however, current drought conditions are expected to push out less productive acreage, allowing growers to replant once drought conditions subside. Current estimates peg 2013/14 almond production at 1.8 billion pounds, down 12 percent from 2012/13, with expectations of smaller nut size and decreases in harvested nuts. However, growers won't be able to quantify 2014 drought impacts until Q2 when nut development becomes more apparent.

The drought is also expected to reduce pistachio production. Roughly 40 percent of California's pistachio trees are located in water districts that will receive little to zero surface water allocations. Many pistachio growers will have to rely on groundwater to supply trees. Pistachio trees are more tolerant of lower quality water than almond trees, however, and those growers that have adequate groundwater supplies are expected to weather this growing season fairly well.

Despite diminished water supplies, California tomato processors will likely have enough planted acreage to satisfy demand in 2014. With the base price for processing tomatoes set at \$83 per ton, growers are expected to have enough incentive to plant adequate acreage, despite high water costs. Wine and table grape growers are bracing for drought impacts in 2014, following two consecutive years of record production. Final production numbers pegged the 2013 crush at 4.7 million tons, up 7 percent YoY. However, in 2014, those growers who have issues sourcing adequate water risk stunting vine production for up to two years.

In the upper Northwest, tree fruit and annual fruit and vegetable production is expected to remain healthy in 2014. Given adequate snowpack levels in Washington and Oregon, as well as sufficient rainfall at lower

“*Logistical problems are rampant this spring driven by the unusually bitter winter and increased shipping demands for nonagricultural products.*”

elevations, fallow acreage is not expected in the upper Northwest. Tree fruit growers are hoping for a mild spring with restrained rains for pollination in coming months.

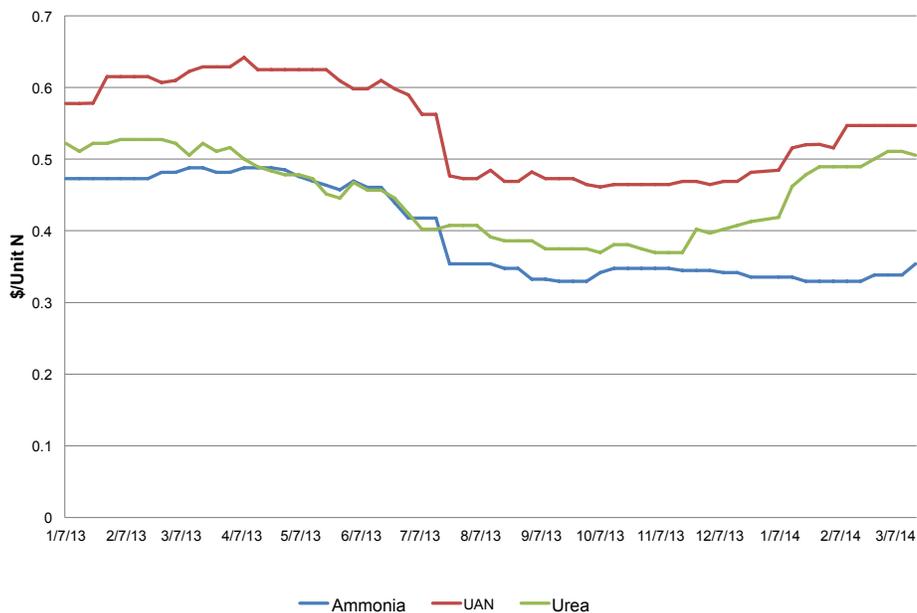
Florida citrus production continues to take a hit. Roughly 70 percent of Florida's citrus trees are infected with citrus greening. With each monthly forecast, the USDA continues to decrease Florida's citrus production. Current estimates peg 2013/14 citrus production at 134 million boxes, down 14 percent YoY. The USDA's crop estimates for 2013/14 are expected to be revised further downward due to smaller fruit size and increased fruit drops due to citrus greening. With roughly 70 percent of Florida's citrus trees being infected by citrus greening, producers are employing a number of methods to cope with decreased production, including: replanting infected orchards, diversifying operations with non-citrus crops and market consolidation. Given tough market conditions for the citrus industry, further market consolidation is expected through 2014.

Farm Supply

Net farm income is projected to fall 27 percent in 2014 to \$95.8 billion, the lowest level since 2010. Higher livestock receipts are not expected to outweigh lower crop receipts and the elimination of direct payments. Total farm production expenses in 2014 are expected to decline 1 percent to \$348.2 billion, largely due to projected decreases in fertilizer price; and this will be the first year since 2009 that total farm production expenses have slipped. Farm margins are expected to erode as farm receipts are projected to fall much faster than expenses in 2014.

Figure 6. Prices of Nitrogen Fertilizers

Per Unit of N



Source: Green Markets (Bloomberg).

Fertilizers

The 2014 planting season is fast approaching. Falling commodity prices and weather-driven logistical issues are again the main topics of discussion at this early stage of the spring application season. Crop input volumes in the coming season will be driven largely by weather, acreage shifts among the planted crops, and growers' efforts at keeping a tight rein on expenses in a thinner margin environment.

Logistical problems are rampant this spring driven by the unusually bitter winter and increased shipping demands for nonagricultural products. Several rail companies have warned shippers of logistical delays and promised better shipping opportunities as the weather improves and infrastructure capital investment projects resume. However, new capital investments are time consuming and may do little to alleviate the congestion before spring. Grain shipments from the Midwest to the Pacific Northwest are rumored to take an additional 6-10 days due to intensified competition for rail space and poor weather.

Barge traffic is also delayed in the upper Midwest due to unusually thick ice blocking the waterways. For

example, ice levels at Lake Pepin on the Mississippi River near Winona, Minnesota, were recently measured at 30 inches, whereas barge traffic typically cannot start to move until ice levels reduce to 10 inches or less. Conversely, if the weather were to improve dramatically in a short period of time with abundant April showers, flooding could occur and exacerbate shipping delays.

Last year's weather-driven late harvest and falling fertilizer prices kept some growers from applying fall fertilizer. So this spring, many growers will apply even more tons than usual. However, growers and retailers alike have been waiting for fertilizer prices to hit bottom

before booking physical product. These delays in booking could well cause delays in delivery, due to mounting logistical glitches. If weather or logistical problems were to dictate a later planting season, growers would likely shift their input demands in both form and quantity, opting to apply less ammonia and more UAN or urea.

Falling commodity prices are likely to spur acreage shifts away from input-intensive corn and into competing crops. Planted corn acreage will still be fairly high, however, with recent estimates pegging it in the range of 90-95 million acres.

Fertilizer prices trended downward during much of the past year, and many companies worldwide curbed production of potash and phosphate. (See Figure 6.) As spring progresses, growers' demand for fertilizer will strengthen, and prices will likely follow suit. Looking beyond the spring application window, the recent declines in supplies suggest that prices are unlikely to resume their downward tilt. Moreover, with the ratio of fertilizer prices to corn prices having aligned with its ten-year average, growers will have an economic incentive as well as the financial wherewithal to apply desired

amounts of inputs, albeit at a more conservative level as commodity prices are forecast to drop with margins tightening during the coming season.

Following a steep decline during 2013, ammonia prices have staged a modest upturn in recent weeks. They increased about 6 percent during the first quarter, but remain 28 percent below the year-ago level, based on a Mid-Corn Belt weekly price report. To date, the geopolitical struggles in the Black Sea region haven't impacted the ammonia market. Weather will likely play the lead role in whether ammonia prices continue to rise this spring. If growers catch a favorable weather window to apply spring tons, prices are likely to firm further in the near term. But if inclement weather impedes the spring application, growers may decide to shift to other sources of nitrogen, although ammonia continues to be the cheapest source of nitrogen on a per unit N basis.

Urea prices have climbed more than 20 percent since the start of the year. With barge shipments in the upper Mississippi River having been delayed due to ice and competition for limited barge capacity and imports running well below year ago levels, the resulting shortages of product have driven prices sharply higher. Domestic demand remains sluggish as retailers wait for growers to book fertilizer. However, with many dealers and growers anticipating that prices will trail off during the summer months, they're attempting to implement a just-in-time inventory approach to avoid large write-offs as prices head lower. India appears to be wading back into the urea market, and uncertainty surrounding the turmoil in the Black Sea region are keeping many urea buyers on the sidelines.

Bolstered by the strength in the urea market, mid-Corn Belt UAN prices have increased around 13 percent through the first quarter. Going forward, UAN demand will likely be tied in part to the volume of ammonia that is applied this spring. The upper Midwest may see more tons move to side-dress UAN from ammonia if the planting season is pushed back due to weather delays. Domestically produced UAN is gaining traction and price support as lower priced imported supplies face logistical challenges in moving from the Gulf ports to the interior markets. The volume of imported UAN is in line with the

five-year average, and UAN production margins are likely to keep production at optimal levels.

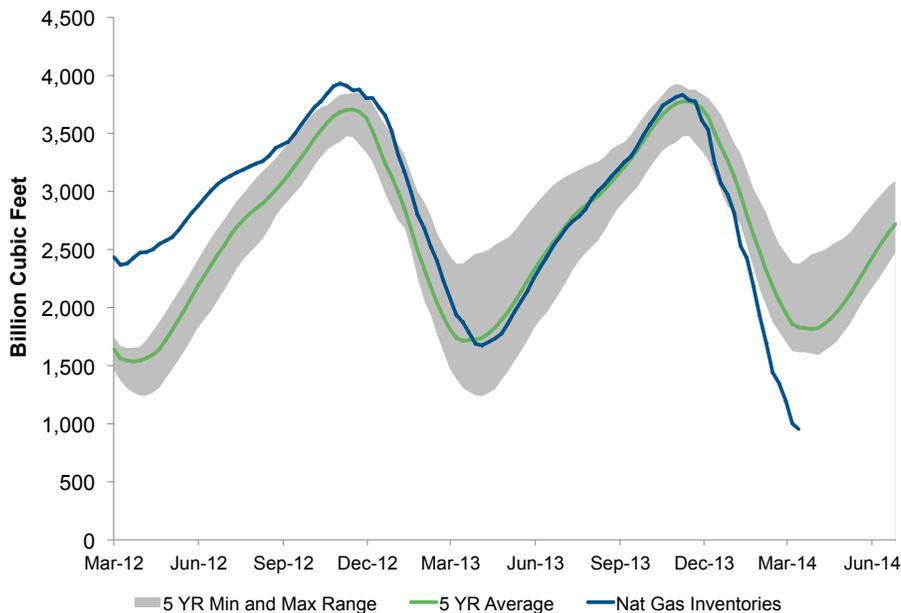
Grower phosphate (DAP) demand remains lackluster heading into the spring application season. Many dealers and growers are waiting to see if there will be any price correction from the recent 27 percent rally over the last few months. Similar to urea, phosphate prices have ratcheted higher due to fears of logistical delays for the spring planting season window, with forward prices in April at a discount. International demand remains on the sideline based on the expectation of lower prices. In the near term, phosphate prices are likely to remain steady as the spring application season gets underway; but prices may drift slightly higher, in the event that global demand begins to strengthen.

Unlike most other forms of fertilizers, potash prices continue to languish. Political tension in the Black Sea region has not had an impact on prices even though Russia is a large supplier. The current low price environment for potash continues to weigh on production companies. Domestically, potash purchases remain subdued, and the downward tilt in prices keeps inventory purchases low as retailers are buying on an as-needed basis. Potash prices are likely to run flat in the near term with potential to drift slightly lower into the second quarter.

Other Crop Inputs

Seed prices are expected to edge up about 1 percent in 2014. Planted acres in 2014 are likely to remain similar to last year, although the mix in acreage allocation will change. The combination of continued advancement in seed technology and relatively robust corn and soybean acres should keep seed demand on par with last year.

Total seed expenditures are projected to rise 1.5 percent in 2014, reflecting the minimal changes in U.S. planted acreage. Popularity and breadth of seed treatments to protect growers' investment in seed may also have an impact on seed expenses as this industry is expected by many to double by 2018. It's a challenge for growers to have the right volume and variety each season as the weather and growing conditions will influence which products will be in highest demand.

Figure 7. U.S. Underground Natural Gas Storage

Source: U.S. EIA

In 2014, prices paid for herbicides are expected to edge up 1 percent while prices for insecticides are expected to increase 2 percent. Herbicide resistance in certain weed species may have local impacts on herbicide prices as growers continue to use different strategies to try to alleviate resistance. The spray-early/spray-often approach using diversified chemical mixes will likely increase expenses in those areas experiencing high concentrations of resistance. Insecticide use may increase to combat issues with insect resistance to certain GMO Bt seed varieties.

Fuel and oil expenses are expected to increase 1 percent in 2014. The U.S. Energy Information Administration (EIA) is projecting that the average price of on-highway diesel fuel will be \$3.82 per gallon in 2014 and will edge down to \$3.73 per gallon in 2015. As the winter weather subsides, there may be some opportunities to price fuel in-between the peak summer driving season and reduced demand for heating fuel. In the near term, look for prices to continue to fluctuate as geopolitical uncertainties impact crude oil price, which accounts for 57 percent of the price of diesel fuel.

Rural Infrastructure

Power and Energy

The first quarter of 2014 brought a series of arctic blasts across the eastern half of the country while crippling drought maintained a stranglehold over much of the west. As a result, power and energy markets experienced record demand for natural gas, electricity and other energy commodities such as propane. These extreme conditions posed the greatest test for the nation's power and energy infrastructure in recent memory, resulting in significant capacity constraints and ultimately historic price surges. As the weather turns more favorable, the market's

efforts to replenish the depleted natural gas inventories while meeting end-user demand will largely dictate natural gas prices, and therefore electricity prices in all major markets through the end of 2014.

With the end of the winter heating season around the corner, total net withdrawals from underground natural gas storage facilities have reached a record high 2,686 billion cubic feet (Bcf), according to the EIA. As of March 24, 2014, natural gas storage inventories amounted to 953 Bcf, 48 percent below the five-year average. (See Figure 7.) This severe drop in storage will place added pressure on storage operators to inject large amounts of natural gas to rebuild inventories in time for the start of the 2014-15 winter heating season. Storage operators will have to inject almost 12 billion cubic feet per day (Bcf/d) into storage from April through October to boost inventories to normal levels. A typical heavy injection season results in net injections of about 10 Bcf/d.

NYMEX natural gas futures indicate a price range of \$4.25-4.75 per million BTUs (MMBtu) over the next 36 months. By comparison, the Henry Hub spot price for natural gas had averaged \$2.75/MMBtu in 2012 and

\$3.73/MMBtu in 2013 and closed out the year 2013 at around \$4.50/MMBtu. These high prices will incentivize natural gas producers to increase output – to as much as 3 Bcf/d by some estimates – which in turn should result in adequate injection rates through the storage refill season. Moreover, with natural gas prices hovering well above \$4/MMBtu, fuel switching towards coal is likely. According to SNL, coal consumption is expected to increase by 4.6 percent in 2014 as natural gas prices remain well above their 2013 levels.

The recent rise in electricity prices in response to the run-up in gas prices has benefited those power generators that rely on relatively cheaper fuels, such as coal and nuclear. Merchant generators and unregulated utilities that are long coal or nuclear and are located in regions where power prices are typically set by gas-fired generation, will benefit the most moving forward, as natural gas prices are expected to rise through 2014.

Gas-to-coal switching economics currently remain favorable for the highly efficient plants that burn low-cost coal, but over the long run, coal remains under fire. Since year-end 2013, over 5,000 megawatts of coal generating capacity have been announced for retirement, due to weak electricity demand growth, continued competition from gas-fired generators, and the need to comply with the Environmental Protection Agency's (EPA) Mercury and Air Toxic Standards (MATS). Furthermore, the EPA has stated its plans to release carbon dioxide (CO₂) requirements for existing plants in June 2014. If implemented, these regulations will have significant implications for investment and operational decisions at all utilities that operate large coal fleets.

Coal and natural gas currently account for 41 percent and 26 percent, respectively, of the country's fuel mix. However, new electricity generating capacity will continue to be dominated by natural gas, solar and wind through 2014. Volatile natural gas and energy prices promote increased renewable energy generation among utilities and end-user customers. Utilities invest in renewable assets partly to hedge against future swings in fuel prices, while higher energy prices make competing renewable technology such as rooftop solar more attractive to customers.

Photovoltaic (PV) solar installations are projected to grow by 26 percent in 2014, with installations amounting to 6 gigawatts (GW). Growth will occur in all segments, but will be most rapid in residential. The Solar Energy Industry of America predicts that residential solar capacity will surpass that of utility solar capacity in 2016. Despite strong growth in the residential segment, some customers still face financial and physical barriers to installing home-sited solar systems. Consequently, many electric cooperatives are building community solar gardens. Customers can purchase a "plot" of panels or subscribe to output from the garden and receive the same benefits as if the solar panels were in operation on their own property. Community solar gardens represent an innovative approach to managing distributed generation within a cooperative's service territory.

Wind development will see much stronger growth in 2014 than in the previous year. Over 90 wind projects are currently under construction in 20 states; and when completed this year, they will generate enough electricity to power 3.5 million homes, according to the American Wind Energy Association. The majority of this new growth in wind capacity is occurring in the middle of the country, from Texas up through North Dakota.

U.S. power and energy markets have been defined in terms of extremes over the last three months, with prices having receded from seasonal peaks. Going forward, however, the ability of storage operators to replenish natural gas inventories will play a key role in determining energy prices throughout 2014. Strong demand for natural gas from storage operators will likely bolster gas prices through 2014, providing an incentive to natural gas producers to increase output while also tipping fuel switching economics in favor of coal. Reduced gas demand from the power sector, coupled with increased production, should enable storage operators to replenish their inventories in 2014. However, storage levels will be closely watched in the next few months; and if storage levels fall below expectations, natural gas prices will be bid up sharply and will likely remain elevated throughout the summer and fall.

Figure 8. Propane Spot Prices – Conway, KS

Source: U.S. Energy Information Administration.

Extremes, including unprecedented price spikes, occurred within the nation's propane markets, and many observers are wondering whether next year will see a recurrence of the severe shortages and price spikes. (See Figure 8.) In recent weeks, demand has subsided with the easing of winter temperatures, but propane stocks, especially in the Midwest, remain below the 5-year average. Just as natural gas inventories and pipeline capacity will dictate energy prices through 2014, the same will be true for propane and propane prices.

However, there are important differences to keep in mind when comparing and contrasting the propane and natural gas markets. First, propane inventories have to compete with exports, which have increased by 178 percent since March 2013. Second, higher natural gas prices reduce the relative value of natural gas liquids such as propane and alter the processing economics in favor of natural gas and at the expense of natural gas liquids. Lastly, the Cochin pipeline, which is a main supply route for propane to flow into the Midwest from Canada, is scheduled for reversal on July 1, 2014. To make up for this loss of 70,000 barrels per day of propane, additional rail, pipeline and truck capacity will have to be built, mainly from the Bakken region in North

Dakota. However, the outlook for propane prices next year depends critically on whether this additional transport capacity can be brought on line before the 2014/15 winter.

Assuming that the market builds adequate transport capacity into the Midwest before next winter, and barring any extraordinary weather events, propane prices will likely remain near seasonal averages through the winter of 2014/15.

Water

Last year, the EPA issued ten consent decrees to municipalities and other public entities for violations of the Clean Water Act (CWA). Since 2009, the EPA has become increasingly

active in addressing CWA violations through consent decrees, and these legally binding agreements often severely strain a municipality's fiscal capacity and redirect dollars away from capital improvements and infrastructure renewal projects. Stricter enforcement of the CWA and other statutes under the purview of the EPA will continue into 2014 and beyond.

With consent decrees exerting greater control over capital investment decisions, particularly within the wastewater sector, utility administrators often face challenging budgeting decisions. Given that 97 percent of the nation's public water systems serve fewer than 10,000 persons, and that 78 percent of the nation's wastewater treatment plants process less than one million gallons per day, many municipalities do not have large enough rate bases to cover the federally mandated expenses. For the customers in affected cities and towns, the expenses associated with consent decrees are often reflected in water and wastewater bills that historically have grown faster than household incomes and the rate of inflation. Very significant affordability challenges are often created, particularly for lower-income households.

Aware of these problems, the EPA has developed its own "affordability" criteria to determine when federal

mandates would cause widespread economic distress in a community. When it identifies such distress, the EPA might loosen the mandate and provide more time for compliance with wastewater and storm water requirements. Affordability of drinking water requirements is handled differently, almost on a case-by-case basis. If the affordability criteria worked as intended, low-income houses would not be subject to financial burden as a result of federal mandates.

However, according to studies completed in conjunction with the American Water Works Association (AWWA), the EPA's affordability criteria are highly flawed. This is due largely to EPA's reliance on metrics such as median household income (MHI), which are highly misleading as indicators of a community's ability to pay, according to the study. As a result, relief is not being provided in communities where financial hardship is being created.

Industry experts have recommended the use of more robust evaluation methods that focus on the households at the bottom of the income spectrum when evaluating affordability. The AWWA study suggests analyzing trends in changing household incomes, water and wastewater consumption, employment and demographics (such as population changes) in evaluating how household economic burdens are likely to change over time.

The water industry is facing significant headwinds when it comes to replacing aging infrastructure. As states' revolving funds continue to dwindle, improvements will likely be delayed resulting in a greater number of CWA violations and consent decrees. Without having an accurate tool to measure customer's ability to pay for federal mandates, the long-term financial stability of municipalities, particularly those with a limited rate base, could be severely strained.

Communications

Faster broadband speeds, video-friendly devices and complementary software, all at affordable price points, have created insatiable data demands and major shifts in how data are consumed. These continuing trends have the communications industry running at a breakneck pace to implement new business models that will provide a solid footing in this changing marketplace.

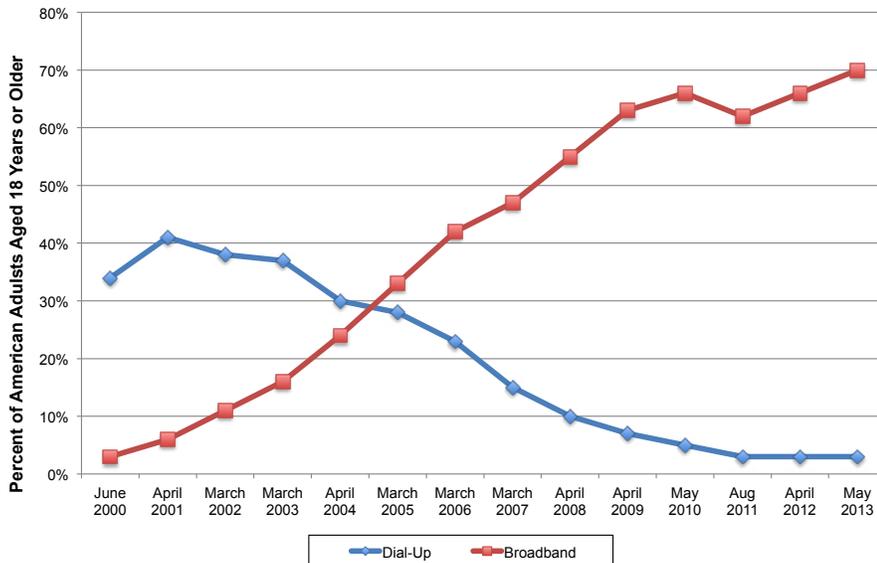
“*The water industry is facing significant headwinds when it comes to replacing aging infrastructure.*”

With the proportion of U.S. households that subscribe to a traditional landline having declined to just 25 percent, consumers have already embraced the notion of an all-IP network. In Q1-2014, the Federal Communications Commission (FCC) took several actions to facilitate a smooth IP Transition – i.e., one involving the eventual shutdown of the legacy telephone network and subsequent move to an all-IP network. The FCC created a test-bed to research and explore telephone numbering in an all-IP environment and also invited carriers to file “expressions of interest” to conduct FCC funded broadband experiments, or trial transitions to an all-IP network. In a two-week period, the FCC received nearly 900 expressions of interest. Critics, including one FCC Commissioner, have cautioned that funding such projects could distract the Commission from making much needed progress on Universal Service reform, and stress that projects should not duplicate the efforts of other programs, including the broadband provisions contained in the most recent Farm Bill.

Broadband connectivity in terms of adoption and speeds continues to climb. The Pew Research Center reported that 70 percent of Americans over the age of 18 had a home broadband connection as of May 2013, well above the 55 percent who had one just five years earlier. (See Figure 9.) Another 10 percent access broadband exclusively with a smartphone. According to cloud service provider Akamai, the average broadband speed in the U.S. reached 9.8 megabits per second (Mbps) during Q2-2013 – 2.1 Mbps faster than the global average. (Many critics, however, are quick to point out that the U.S. lags far behind in peak broadband speeds and also highlight the digital divide that exists between rural and urban/metro areas of the country.)

Increased connections and speed have also spurred data traffic to all-time highs. The average Internet user in

**Figure 9. Home Access to Internet, 2000-13
Broadband vs. Dial-Up**



Source: Per Internet and American Life Project Surveys, 2000-13.

North America generated 44.7 gigabytes of data traffic during the second half of 2012 and the first half of 2013, a staggering 39 percent increase from the previous 12-months, according to broadband network provider Sandvine. Wireless guru Chetan Sharma estimated that Americans consumed on average 1.2 gigabytes of data per month over mobile networks during 2013; nearly double the 2012 rate. Sharma attributes the jump in usage to the deployment of faster wireless networks and mobile devices with larger screens.

But improved connections and devices simply enable the true driver of Internet traffic – streaming video and audio. Sandvine found that streaming video and audio made up the majority of data traffic on every network analyzed. YouTube content, for instance, remains the largest traffic generator in the world, on both fixed and mobile networks. In North America, nearly one-third of downstream data traffic on fixed networks can be attributed to Netflix, and its mobile network traffic volume nearly doubled during the year ended in June 2013. Roughly 50 percent of the 5 million Hulu Plus subscribers stream content on devices such as smartphones, tablets, and over-the-top (OTT) set top

boxes. Research firm NPD Group forecasts that 202 million TVs will be connected to the Internet by 2015, up 44 percent from the 140 million TVs connected at the beginning of 2013. These trends suggest that the rapid data consumption growth will continue for the foreseeable future.

The industry is abuzz about the Internet of Things (IoT), previously referred to as machine-to-machine (M2M); it involves the connection of devices that autonomously perform provision, management and monitoring tasks. Analysts predict that the IoT marketplace will grow to \$7.3 trillion by 2017. Cisco estimates that IoT will contribute \$19 trillion to the global economy during the next

10 years. The big opportunity for the communications industry lies in providing connections for the 26 billion “things” that are expected to be connected by 2020. In this vein, AT&T has announced partnerships with Audi and IBM to provide connections for WiFi hotspots in automobiles and devices to create “smart cities.” Experts also expect agriculture and livestock producers to benefit greatly from IoT technology, making rural areas an important part of the marketplace and a ripe opportunity for communications companies serving those territories.

The cloud will remain a critical part of the communications industry, as enterprises and consumers favor the ability to access data anywhere on any device. Although the infamous Snowden leaks were expected to cause some attrition and slowed growth for U.S cloud providers, amounting to as much as a \$35 billion loss, the fallout has been far less severe. In fact, leaks and other recent security breaches may have instead effectively boosted the cloud. Gartner forecasts that the cloud-based security market will expand by a billion dollars to \$3.1 billion by 2015. Additional cloud-based opportunities to watch in coming months are virtualization or software-defined networking and big data.

The streaming trend and disruptions to the pay-TV model have long impelled cable and satellite companies to place an emphasis on high-speed data products. TV providers are rolling out more robust TV Everywhere apps, giving customers the capability to stream live TV, video-on-demand (VOD) content, and most importantly, remote DVR access. Comcast noted that a decrease in churn and uptick in paid VOD delivered the return on investment necessary to roll out the enhanced TV Everywhere app. This move also combats OTT competition and could effectively add enough value to sustain the pay-TV model well into the future, especially when packaged with a high-speed data service.

Increased data traffic has also given larger broadband providers significant marketplace control. Edge providers – that is, Internet-based companies that transmit a significant amount of data – must now partner with broadband providers to ensure quality delivery of content. Case in point, Netflix recently agreed to pay Comcast an undisclosed amount for direct access to Comcast's network, which will improve delivery of programming to the end user. Netflix is in similar negotiations with Verizon, and YouTube has had comparable agreements in place for some time. Advantages of market control coupled with scale economies likely underpinned Comcast's successful bid to acquire Time Warner Cable and may trigger a surge in merger and acquisition activity among broadband providers.

A recent court decision that struck down the FCC's net neutrality rule has reignited the debate. The court ruled that the FCC does have the authority to regulate broadband providers' treatment of Internet traffic, but that providers should be allowed to prioritize traffic on their network so long as customers are informed of the practice. The Netflix-Comcast agreement and the Comcast-Time Warner Cable transaction have also added fuel to the fire. Net neutrality advocates caution that allowing broadband providers to accept payment for traffic prioritization will lead to an Internet that is dominated by a few large companies and will likely stymie innovation. (However, the recent Netflix-Comcast deal does not prioritize traffic, but rather gives direct

access to Comcast networks.) The same advocates also contend that an overwhelmingly dominant broadband provider would also seriously hinder competition. The FCC has started work on new net neutrality rules that will allow providers to prioritize network traffic but prohibit prioritization that is deemed anti-competitive.

Although the Senate will not be following the House's lead to rewrite the Communications Act, dashing hopes for legislative telecom reform, recent action by the FCC has given the rural communications sector reason for cautious optimism. Following the lead of newly appointed Chairman Tom Wheeler, the FCC has taken steps to officially end quantile regression analysis and construct a method that better directs ongoing federal dollars to support a ubiquitous national broadband network. Though the lack of clarity continues to delay infrastructure investment, Wheeler seems motivated to find a solution. The FCC has also continued to levy hefty million-dollar fines on companies that ignore rural call completion rules. It has begun an internal review of processes and procedures that will streamline FCC operations and make it easier for the public to obtain FCC data, ahead of a House legislative mandate. While recent actions have provided positive momentum, rural advocates continue to lobby against several record-keeping and reporting requirements and emergency assistance initiatives that would strap small communications companies with significant costs and administrative burdens. ■

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. We also want to recognize the contributions of two outside groups: analysts at Blimling and Associates prepared the overview of the dairy industry, and analysts at Plus One Strategic Communications LLC prepared the overview of the communications industry.

Terry Barr

Senior Director, Knowledge Exchange

Daniel Kowalski

Senior Manager, Grains, Oilseeds, and Ethanol

Luke Brummel

Economist, Farm Supply Industry

Taylor Gunn

Economist, Power, Energy, and Water

Rachael Dettmann Spiegel

Senior Economist, Animal Proteins, and Specialty Crops

Leonard Sahling

Manager, Knowledge Exchange

**CoBank's Knowledge Exchange Division welcomes readers' comments and suggestions.
Please send them to KEDRESEARCH@cobank.com.**

Disclaimer: The information contained in this report has been compiled from what CoBank regards as reliable sources but is provided for general informational purposes only and is not advice. CoBank does not make any representation or warranty regarding the content, and disclaims any responsibility for the information, materials, third-party opinions, and data included in this report. In no event will CoBank be liable for any decision made or actions taken by the user while relying on information contained in this report.