



QUARTERLY U.S. RURAL ECONOMIC REVIEW, Q3-2013

Global Grain Harvest Sets the Stage for Rebuilding Stocks

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...

Preview.....2
 Macroeconomic Outlook.....2
 U.S. Agricultural Markets.....3
 Grains, Oilseeds, and Ethanol.....3
 Animal Protein.....6
 Other Commodities.....11
 Farm Supply.....15
 Rural Infrastructure16

Key Points:

- *The U.S. economic recovery continues to be fragile and subpar, due to fiscal drag, uncertain monetary policy, unresolved deficit and debt ceiling issues, and the partial shutdown of the federal government.*
- *Global grain and oilseed production will reach record levels in 2013/14, and global stocks will begin to rebuild.*
- *This year's U.S. grain harvests will generally be much better than last year's, though well below last spring's lofty expectations. In fact, the soybean crop is projected to be only slightly larger than last year's, leaving 2013/14 ending stocks at historically low levels.*
- *After last year's tight supplies created an inverted corn market throughout 2012/13, cooperatives and commercial elevators will benefit from a healthy carry being restored to the market in 2013/14.*
- *The greatest challenge facing the ethanol industry is the need for discipline. Demand for U.S. ethanol has plateaued, at least for the near-term, and production capacity remains 10 percent greater than current demand.*
- *Assuming lower feed costs in the closing months of 2013 and into early 2014, the pork and broiler industries are well positioned to increase production and profitability during the next six months, while the beef industry will likely begin to rebuild one of the smallest herds in recorded history.*
- *U.S. crude-oil production in August hit the highest monthly level in 24 years. Industry experts unanimously agree that there is far more potentially productive oil shale in the U.S. than anyone ever thought possible.*
- *Record-high U.S. production from shale oil and gas reserves is proving to be the largest driver of increased investments in the midstream infrastructure sector.*
- *To be competitive, communications service providers today must deliver not just connectivity, but also value-added, IP/cloud-based services such as enhanced data services, security and home/lifestyle management tools, over-the-top products and IT infrastructure.*

Preview

Downside risks continue to plague the global economy. Sovereign debt and fiscal issues are constraining the advanced economies, emerging markets have been limited by the weakness in exports to the advanced economies, and central banks have been backed into a corner and left “pushing on a string.” These conditions are likely to prevail well into 2014 and will continue until structural reforms are implemented that will release the significant pent-up growth potential that has been building. The lack of a robust economic recovery has constrained central bank authorities from any major change in monetary policies.

Despite continuing uncertainty regarding the U.S. soybean crop, it is now apparent that global grain and oilseed production will reach record levels in 2013/14 and that inventories will begin to build. While the rebuilding of supplies will reduce prices from the elevated levels of the past few years, it will not result in burdensome stocks relative to global usage. Animal protein and dairy sectors will benefit from sharp declines in feed costs and continuing strong domestic and foreign consumer demand.

Macroeconomic Outlook

It's been four years since the Great Recession ended, and the global economic recovery is still having difficulty gaining traction. The Euro region appears to have ended its six quarter recession and registered positive growth in the second quarter of 2013. The recent German elections should clear the way for more policy action, yet the resulting coalition government will remain reluctant to underwrite the debt of weaker Euro region countries. Sovereign debt issues have remained in the background for a while but could resurface quickly as several countries are in need of further assistance. China's economic growth seems to have stabilized in the 7-8 percent range as policymakers continue to seek a transition to consumer-led growth from the export-led and government investment strategies of the past decade. Japan has enjoyed relatively strong growth in the first half of 2013 (2.8 percent, annualized) as a result

“Central banks have been backed into a corner and left “pushing on a string.”

of significant currency devaluation, but some of that momentum appears to be weakening. Growth rates in the balance of emerging Asia will remain linked to the stuttering pace of exports to the advanced economies. Brazil, the largest economy in South America, continues to benefit from the devaluation of the Brazilian real (down 15 percent versus both the U.S. dollar and Euro) with stronger exports having boosted growth.

The U.S. economic recovery, plagued with its own downside risks, continues to be fragile and subpar. Fiscal drag, uncertain monetary policy and unresolved deficit and debt ceiling issues have complicated an already subdued growth pattern. The partial shutdown of the federal government will trim real GDP growth in the fourth quarter, by about 15 basis points for every week that the shutdown lasts. But more importantly, it raises questions about Congress's “capacity to govern,” in the words of one concerned commentator.

The current U.S. economic growth pattern of 2-2.5 percent a year is likely to continue well into 2014. While fiscal drag from declining government spending will curtail growth, the consumer sector remains solid. Deleveraging has been largely accomplished, and consumers have seen consistent gains in home and car sales. However, consumers remain cautious with respect to credit card usage, and consumer spending will remain strongly linked to income gains and job market growth. With some resolution regarding deficit/debt issues, we could see business fixed investment spending begin to accelerate in the second half of 2014 and improve growth prospects beyond the 2.5 percent threshold.

Looking ahead to the next year, the value of the U.S. dollar is likely to continue rising against other currencies. In fact, after declining nearly 40 percent over 2002-11 the value of the U.S. dollar, calculated on a trade weighted basis, has climbed fairly steadily since then. From August 2011 to August 2013, the value of the

U.S. dollar increased about 10 percent, largely reflecting an 8 percent gain against the euro and a 27 percent increase against the yen. The consensus forecast calls for a continued slow rise in the value of the U.S. dollar, assuming that the global economy continues to limp along and avoids “black swan” events.

U.S. Agricultural Markets

Global grain and oilseed production will reach record levels in 2013/14, and global stocks, in turn, will begin to rebuild. Crop prices have been on the decline for months in anticipation of the increased supplies. Uncertainties do remain regarding U.S. and South American soybean production, but global grain supplies will increase substantially.

Economic conditions in the animal protein and dairy sectors have improved steadily over the past six months. Domestic and foreign demand has held up surprisingly well despite rising prices. With the emergence of larger grain supplies and steep reductions in feed costs, these two sectors should continue to improve into 2014. While today’s extremely low cattle inventory will curtail beef production in 2014, the stepped-up pace of production increases for pork, broilers and dairy could undermine some of the bullish price expectations for 2014 and limit future margin gains.

Grains, Oilseeds, and Ethanol

The grains complex is now transitioning from a market defined by excessively tight old crop stocks to one defined by buoyant expectations for a record-breaking new crop harvest this fall. Late summer and early fall weather, however, proved somewhat uncooperative. This year’s grain harvests will generally be better than last year’s, albeit well below last spring’s lofty expectations. In fact, the soybean crop is projected to be only slightly larger than last year’s, which will keep supplies at historically low levels.

Corn

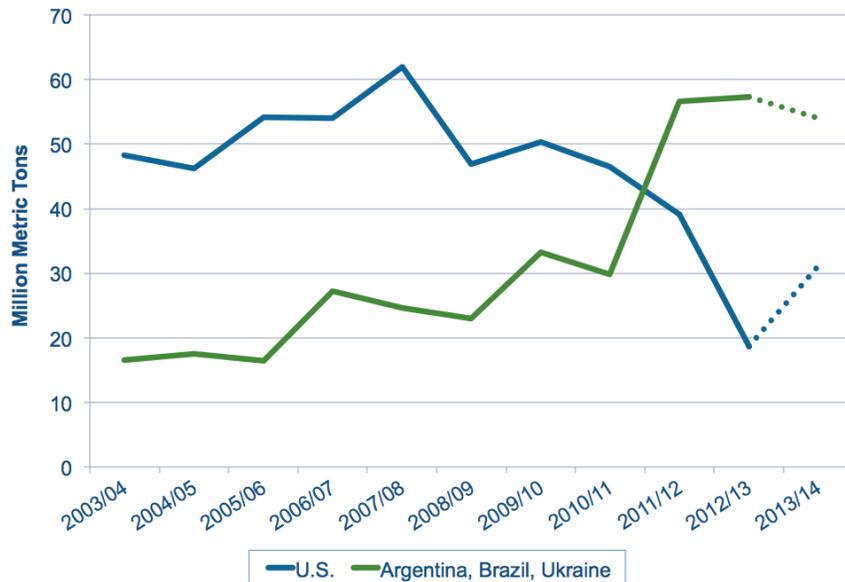
Following last year’s disappointing harvest, the new corn marketing year has begun with high expectations

for a record large domestic corn crop. The 2012/13 corn season was defined by near record low statistics in almost every category, setting up 2013/14 with the second lowest beginning stocks since the mid-1970s. Tight supplies for the old crop kept prices at historically high levels through the summer as grain bins across the country were emptied.

The 2013/14 corn crop got off to a delayed start, as the wet spring and cool early summer led to one of the slowest developing crops on record. Then the heat turned on in July and August, and the weather turned dry, dragging yield expectations further below trend levels. The largest corn acreage in 80 years will offset the disappointing yields, boosting U.S. supplies to adequate levels for the first time since 2009. The USDA’s September grain stocks report provided further evidence of that transition by revealing that the corn carryover from 2012/13 into 2013/14 is 25 percent greater than what was estimated in the early-September WASDE report. This revision has added to the bearish tone in the market, with most analysts attributing the higher stocks to persistent wheat substitution in feed rations. Without the need for intense corn supply rationing, the season average price will fall by about a third, from \$6.90 a bushel last year to the range of \$4.30-5.30, bolstering margins for the protein, dairy, and ethanol sectors. U.S. corn exports will also rebound impressively from historic lows. USDA analysts expect exports to climb 67 percent over last year’s levels, partially restoring the U.S. share of world trade, which has declined markedly since the mid-2000s. (See *Figure 1.*)

World corn output will also reach a record high in 2013/14, elevated to new heights by records set for global corn area and yields. Abundant harvests in the Black Sea region, China, India, and South America are driving world production growth. Strong trade competition from Ukraine, Brazil, and Argentina will limit the resurgence in U.S. exports.

Domestically, as bins go from empty to full this fall, grain handling margins should improve dramatically. After last year’s tight supplies created an inverted corn market throughout 2012/13, cooperatives and commercial elevators will benefit from a healthy carry being restored

Figure 1: Corn Exports, U.S. versus Major Competitors

Source: USDA-FAS

to the market in 2013/14. Widespread autumn rains will also bolster drying revenue, further strengthening grain handling balance sheets.

Soybeans

The delayed planting and late season heat and dryness were much less forgiving to this year's domestic soybean crop than they were to corn. Yield estimates are currently 7 percent below early season projections, and supplies are expected to rise only marginally from last year. The late development of the soybean crop also elevated the risk of early frost damage. However, temperatures through September and early October remained warm enough across the key growing regions to mitigate any such risk. The advancement of harvest will pressure prices in the near term, and tight stocks will keep domestic prices elevated and volatile in comparison to corn and wheat. The season average farm price is expected to fall from \$14.40 a bushel last year to the range of \$12.00-13.00.

Despite the disappointing crop, demand prospects for U.S. soybeans remain strong. World demand for soybeans will rise 4 percent as countries attempt to begin rebuilding depleted inventories. Within the U.S., the

Renewable Fuel Standard (RFS) mandate will boost domestic soybean oil demand for biodiesel production by nearly 25 percent year-over-year (YoY). Domestic demand for soybean meal will also rise as hog and poultry production expands.

Another year of weaker than expected domestic production, combined with strong demand for soybeans both domestically and globally, will create very different supply scenarios for the U.S. and the rest of the world. The U.S. stocks-to-use ratio is projected to remain below 5 percent for the second consecutive year while global stocks-to-use is expected to increase to a 3-year high. The abundance of supplies in South America will limit gains in U.S. exports even as China's demand increases for the ninth time in

ten years. Nonetheless, new crop U.S. soybean sales as of mid-September were at an all-time high, with China being the dominant buyer. Early sales will be important for U.S. exporters, as sales will be heavily front-loaded in the first half of the marketing year, in anticipation of exceptionally large South American crops coming on line beginning in February.

South American supplies will also limit upward price movements, especially if Brazil and Argentina meet the market's lofty expectations for another record harvest in early 2014. Roughly 80 percent of the world's soybeans are grown in 3 countries (i.e., U.S., Brazil, and Argentina) and Brazil and Argentina together account for half of world production. Thus, the global supply situation is highly dependent on the size of the upcoming South American harvest. Dry conditions in portions of Brazil and Argentina warrant a watchful eye as planting season advances.

No matter how big South America's upcoming harvest turns out to be, U.S. producers can be expected to plant one of the largest soybean crops in years come next spring. It will take a large domestic soybean harvest to bring supplies up to comfortable levels, and the market is expected to incentivize producers to make the shift from corn to soybeans. Agronomics will also

Figure 2: Wheat/Corn Price Ratio

Source: CME Dec 2013 corn and wheat futures

play a role, as many producers will be looking to rotate fields out of corn and into soybeans after two years of very large corn plantings.

Wheat

The current domestic wheat situation for the 2013/14 crop has been defined by very different geographical growing conditions across the country. The hard red winter wheat (HRW) crop, which makes up half of U.S. wheat production, was hampered by a lack of precipitation and a cold spring in the Southern Plains states this year. Conversely, the soft red winter crop, which comprises about 25 percent of U.S. wheat, flourished amidst nearly ideal growing conditions in the eastern states. For all wheat classes, domestic supplies will decline slightly this year, even as global production sets another record for the sixth time in 8 years.

After following corn prices throughout most of 2012/13, wheat prices have separated from corn in recent months as the domestic supply situations for the two grains diverged. (See Figure 2.) Wheat exports have been very strong since the start of the marketing year (June-May), as China and Brazil have supported shipments that far exceed the 3-year average for this point in the season. Exports are expected to decline in coming months, however, as Brazil is expected to shift its sourcing back

to Argentina when harvest begins there in earnest. Ample supplies will be available from other major exporters as well, including the EU, Canada, Russia, and Australia; however, next year's winter wheat harvest for Eastern Europe and Russia will likely be smaller than first thought, due to excessive rain during planting. Domestically, wheat consumption will fall this year as corn becomes less expensive and replaces wheat in most animal rations.

Over the next several months, the wheat market will likely remain stronger than corn, but the disparity in performance will depend on the number of U.S. acres sown and the

crop's emergence. HRW wheat plantings are expected to rise slightly from last year, provided that there is sufficient soil moisture to deem planting worthwhile. Late summer rains have aided in moisture replenishment in parts of key HRW states such as Colorado, Kansas, and Oklahoma, but more precipitation will be necessary to produce a decent crop. Wheat could also set its own course in the market if exports do not decline as anticipated early in the fourth quarter of 2013. On average, the season price for wheat is expected to ease from \$7.77 a bushel to a range from \$6.50-7.50.

Ethanol

Perhaps the greatest beneficiary of the declining price of corn will be the ethanol producer. After enduring one of the most challenging years in the industry's history in 2012, and coping with a year of expensive corn inputs in 2013, the industry is now purchasing cash corn at its lowest price in 3 years. Those procurement costs will decline even further as the corn harvest advances and new crop supplies become widely available. In recent months, ethanol production has increased modestly, but inventories have remained in check, as many producers have curbed plant output in anticipation of better margins during and after the fall harvest.

The greatest challenge facing the industry for the remainder of 2013 and 2014 will be the need for discipline. Demand for U.S. ethanol has plateaued, at least for the near-term, and production capacity remains 10 percent greater than current demand. Therefore, producers will attempt to balance the objectives of producing sufficient volumes of ethanol to rebuild balance sheets, without producing above the level of consumption. If the right balance is not struck, stocks will rise, sinking both ethanol prices and production margins.

Ethanol market participants are also anxiously awaiting the EPA's release of the RFS blending requirements for 2014. The EPA hinted in August that the agency will take into account the blend wall (which has now set a market ceiling for domestic ethanol consumption) when formulating the 2014 blending mandate. This will mark the first time that the EPA has modified the RFS blending statute in such a way that affects corn ethanol. Whatever the 2014 mandate will be, it will have a demonstrable impact on blenders (i.e., oil companies), but it will have only a negligible impact on ethanol producers. With few opportunities to expand export markets, near-term ethanol demand will remain steady at slightly more than 10 percent of U.S. gasoline consumption.

Until complications related to higher volume blends such as E15 and E85 are resolved, ethanol consumption will remain flat. And in the absence of their resolution, E10 ethanol consumption will decline in lock step with the downtrend in gasoline fuel consumption. Therefore, margin management will be key to the ethanol industry's sustained success in the coming 6 to 12 months.

Animal Protein

Animal protein producers and processors are eagerly looking forward to closing their books on 2013. Assuming lower feed costs in the closing months of 2013 and into early 2014, the pork and broiler industries are well positioned to increase production and profitability during the next six months, while the beef industry will likely begin to rebuild one of the smallest herds in recent history.

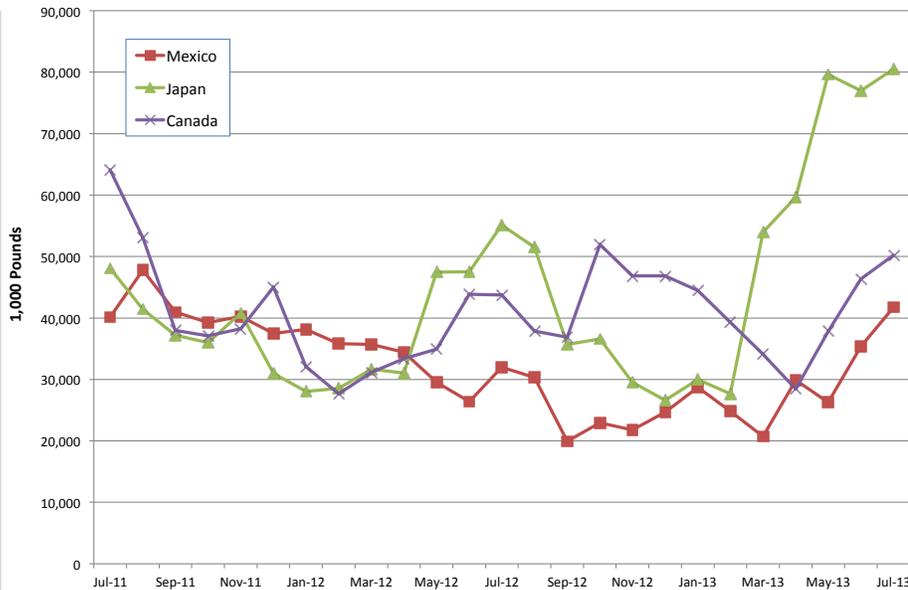
Beef

The cattle industry is at a crossroad. With the drought easing throughout many cattle grazing regions, along with the prospect of lower feed costs, the cattle industry is starting to show early indications of herd growth. Heifer retentions are expected to increase through the remainder of 2013 and into 2014, while beef cow slaughter is currently below year ago levels, where it is expected to remain for the rest of 2013. Expectations of lower feed prices and continued improvement of grazing conditions are encouraging cow/calf operators to retain heifers for breeding, while cow/calf margins are expected to improve for the remainder of the year and into 2014.

Feeder cattle are expected to be in tight supply during the rest of the year, paving the way for smaller placements of cattle on feed and decreased production through the first half of 2014. An early October blizzard in South Dakota will further decrease national feeder supplies slightly as reports, at time of press, cite that at least 60,000 head were lost in the early October storm. Tight domestic supplies and significant decreases of feeder cattle imported from Mexico are exacerbating tight feeder market conditions. As of July 2013, year-to-date (YTD) imports of feeder cattle from Mexico were down 46 percent YoY, while the number of cattle placed on feed in August was 11 percent below what it was a year ago. Consequently, feedlot margins will continue to be squeezed through year-end due to tight feeder supplies and excess capacity within the feedlot sector.

With fewer heifers and cull cows going to slaughter, coupled with a small calf crop in 2013, beef production in the fourth quarter is expected to fall 7 percent YoY. Ground beef supplies, in particular, are expected to be tight over the next few quarters due to fewer cows being sent to slaughter. Another factor that could possibly hamper beef production over the next few quarters is the recent suspension of the popular beta-agonist feed additive Zilmax. Recently, the top four beef packers announced they would no longer accept cattle that have been fed Zilmax. Shortly afterwards, Zilmax's manufacturer, Merck, decided to suspend Zilmax sales until further research could be conducted on the possible

Figure 3: Monthly U.S. Beef Exports to Top Export Destinations



Source: USDA

animal welfare issues associated with this food additive. There is much debate within the industry about what impact this suspension will have on slaughter weights. However, slaughter weights are expected to drop only slightly over the next few quarters as cattle feeders adjust to multiple options for adding weight to cattle such as switching to other feed additives or keeping cattle on feed longer as feed prices trend downward.

With tighter supplies of cattle available for slaughter, beef prices are expected to hover above year-ago levels for the remainder of 2013, and meatpackers' margins are expected to tighten in the closing months of the year. Other factors affecting beef prices are the current issues related to cattle trading and the current partial government shutdown. The beef industry, as well as pork and dairy industries, rely heavily on USDA data to formulate contract pricing, as well as futures market contract settlements. With the partial government shutdown, the USDA terminated price reporting across all animal protein sectors, leaving processors, feedlots and producers scrambling to find substitute data that can be used to set formula and contract base prices, spot markets and futures prices. With the USDA not providing the important market function of price discovery, markets are bogged down with high transaction costs of price

determination. Market experts are uncertain about the short or long term price effects of the current data blackout; however, futures contracts have implemented temporary measures against which to settle.

Despite higher prices, domestic and foreign demand has continued to grow at a modest pace. High beef prices usually tend to dampen exports, but foreign demand has remained strong for U.S. beef in 2013, with YTD exports in July up 3 percent YoY.

Following the recent easing of import restrictions on U.S. beef, Japanese consumers continue to increase their consumption of U.S. beef. As

of July 2013, YTD exports to Japan were 52 percent higher YoY, while July exports were the highest since October 2003, just prior to the BSE export ban on U.S. beef. (See Figure 3.) Exports to Mexico and Canada also remain healthy, despite a slow start in the first half of 2013. As of July 2013, exports to Mexico have increased 11 percent YTD, while YTD exports to Canada climbed 15 percent YoY. Exports to both countries are expected to remain strong through the rest of the year, considering that cattle herds in both countries underwent massive liquidation over the past two years due to drought conditions; and U.S. beef imports will be needed to satisfy domestic demand.

Pork

With restricted beef supplies expected into early 2014, the pork industry is poised to benefit as a good substitute for beef. Bucking analysts' expectations, the pork industry refused to scale back production through the first half of 2013, despite high feed prices and weak-to-negative margins. Instead, the industry chose to maintain production in anticipation of cheaper feed prices toward year-end. Although pork production is expected to remain relatively flat for the remainder of 2013, multiple signs point toward increased pork

production into early 2014. Key indicators include a sharp 9 percent decrease YoY in sow slaughter in previous months, several major investments in new hog production facilities throughout the Midwest, and Cargill's recent announcement of the construction of a new \$29 million feed mill in Iowa. In light of these market signals, pork production is expected to increase by 2 percent in the opening months of 2014.

The current swine herd is proving to be especially productive, averaging a record 10.3 pigs per litter, and this productivity is expected to continue into 2014. However, the number of pigs that actually make it to slaughter has been impaired by the current epidemic of Porcine Epidemic Diarrhea Virus (PEDV). How much PEDV will actually reduce production rates remains to be seen, but if the epidemic subsides or a vaccine is found to quell the impacts of PEDV in coming months, the breeding herd could further increase production by an incremental 1-2 percent into early 2014.

Slaughter rates have been slow in recent weeks, due to hot weather through the Midwest impairing the ability of hogs to reach market weights, and possible effects of PED virus. However, analysts previously were expecting hog slaughter to be appreciably lower than year ago levels when high feed prices earlier in the year caused producers to accelerate slaughter rates of lighter-weight animals. Currently, the industry is in a "wait and see" mode in assessing whether this is a short term blip in supply or whether current slaughter rates are a signal for tighter hog supplies through the end of the year. Either way, packer margins should remain positive, though not as strong as they normally are at this time of year. Some analysts suspect that packers might be holding back on their hog purchases in hopes of improving packing margins in the closing months of the year.

Pork prices remained elevated in the third quarter, bolstered by strong domestic demand and the comparatively high prices for beef and poultry. In July, retail pork prices were up 4 percent YoY, marking the fifth consecutive month of YoY price gains. Reduced cold storage stocks of pork also testify to the strong domestic demand. Cold storage stocks were down 8

percent YoY in August, following a 1 percent decrease in the previous month.

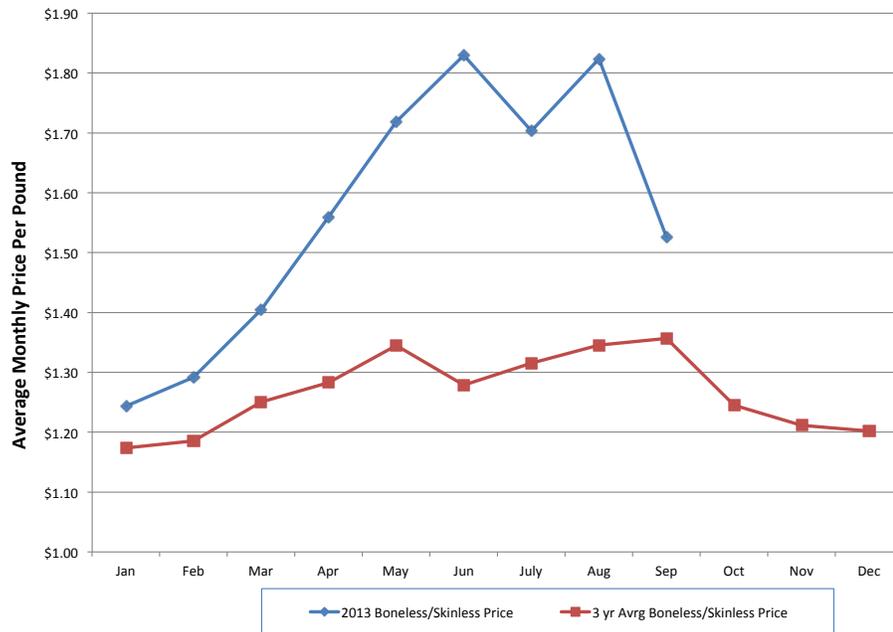
Pork exports, however, have been lagging. Growth in U.S. exports is expected to be lower in 2013, following the record-high growth rates of the past three years. As of July 2013, pork exports YTD were down 9 percent from a year ago, due to decreased shipments to China, South Korea and zero shipments to Russia. At the same time, exports to Japan and Mexico – the top two export markets for U.S. pork – remain fairly strong. July exports to Japan increased 2 percent YoY, and Mexico's imports of U.S. pork soared 25 percent YoY. Export markets are expected to strengthen into 2014. Indeed, the industry is counting on healthy growth in U.S. pork exports next year to ensure that the domestic market is not flooded with excess supplies, which would depress prices.

U.S. pork exports to China are likely to move to the fast track over the coming year. Late in September, Shuanghui International Holdings Ltd., a Hong Kong based food company, completed its acquisition of Smithfield Foods Inc. for \$7.1 billion, including debt. Company representatives announced that they will seek to expand Smithfield's global presence by targeting such major export markets as China, Japan, Australia, and South Korea. The consensus view is that the merger will strengthen animal protein trade relations between the U.S. and top export markets and will also make it less likely that China will impose non-tariff barriers on U.S. pork exports.

Poultry

Within the animal protein complex, the broiler industry has been the bright star of profitability during 2013 (despite elevated feed prices), thanks to strong demand and producers' inability to bolster supply as quickly as they'd like. Profit margins, however, are expected to moderate from the highs realized in the late spring and early summer months, in line with normal seasonality through year-end 2013. The hatchery supply flock has been constrained by a small and aging breeding flock. (An older breeding flock means egg hatchability is lower compared to a younger flock.) Nonetheless, production is expected to increase slightly through year end, with a 4 percent increase in the hatchery supply flock and a 1 percent

Figure 4: Average Price of Chicken Boneless/Skinless Breast Meat



Source: Express Markets, Inc.

increase in poults placed during the fourth quarter. Total broiler production is expected to increase 2 percent in 2013, followed by an additional 2-3 percent gain in 2014.

Domestic demand for broilers has remained strong in 2013, thanks to high beef and pork prices. Despite the usual seasonal drop in prices in Q3/Q4, broiler prices held steady after the Labor Day slump and are expected to remain high YoY through the end of the year. Prices for boneless breast meat reached highs in 2013 not seen since 2004. Boneless/skinless breast meat prices also remained well above 2012 price levels and are expected to average around \$1.45/lb through year-end. (See Figure 4.) Wing demand is demonstrating seasonal strength driven by the NFL season and restaurant features. Demand for wings is expected to push prices well above the five year average, but prices will remain slightly below record 2012 prices. Cold storage numbers are also reflecting strong demand for chicken, with breast meat stocks 5 percent lower YoY in August.

Export demand for broilers has remained strong, thanks again to the comparatively strong pork and beef prices. Year to date exports of U.S. broiler meat is up 3 percent

YoY, due to strong demand for dark meat in export markets like China and Mexico. Year to date exports to China are 73 percent higher YoY, while exports to Mexico are 23 percent higher YoY. Total exports of U.S. broilers in 2013 are expected to be 2 percent higher, compared to 2012.

The turkey industry continues to struggle. Cuts in turkey production have been underpinned by reductions in poult placements, which are averaging 8 percent below what they were a year ago. Slaughter rates have also decreased YoY and are expected to decline through the end of the year given decreased production. Cold storage numbers for turkey have been high, due to lackluster demand, but given additional production cuts

expected through year-end, cold storage inventories are expected to drop in Q4 and into early 2014. Prices for both ground turkey and whole toms have continued to slide due to lackluster domestic demand. The turkey industry is expected to adjust production through 2014, with industry margins hovering below breakeven levels.

Dairy Industry

The dairy industry has also struggled with elevated feed costs for the past several years, and high feed costs have been the primary driver affecting producer breakeven prices, profitability, and all other aspects of the industry. For example, early in 2013, the U.S. cow herd posted YoY declines. But beginning in mid-2013, whispers of a New Zealand drought sent prices climbing and encouraged U.S. dairymen to stop liquidating and begin rebuilding the cow herd. Cow slaughter rates in recent months have been running below year-ago levels, indicating continued herd growth. At the same time, New Zealand's drought conditions have improved, but China has banned imports of most powdered milk products from New Zealand due to food safety concerns.

New Zealand's challenges have been a boon for U.S. exports. For the YTD through July, U.S. dairy product exports on a volume basis were up 9 percent YoY, and the U.S. succeeded in gaining market share against major competitors. At the same time, U.S. exports were uneven through much of 2013, with exports of some dairy products posting surprising increases while others have recorded no-less surprising declines. For example, U.S. butter exports have been on a rollercoaster – down as much as 30 percent YoY in some months but up as much as 147 percent in other months. On balance, total dairy exports have helped support domestic dairy product prices, but their irregular ups and downs have also created inconsistent demand signals.

Feed costs are another source of uncertainty for dairy farmers. Analysts foresee a large gain in the 2013/14 corn crop, although the extent of the increase is still uncertain. Feed costs are expected, in turn, to decline from recent peaks, with corn prices falling as much as 30 percent and hay prices slipping 10-to-15 percent. While

“*Dairy product exports stand out as the U.S. dairy industry's greatest opportunity – but are also its gravest risk.*”

the milk-feed ratio is still very low today, analysts expect it to trend upwards to slightly more profitable levels during the next six to twelve months.

The continuing debate about the 2013 Farm Bill has created additional uncertainty for dairy farmers. If Congress simply extends the 2008 Farm Bill, the nation's dairy program and policies will remain in place. Alternatively, if Congress were to enact a new Farm Bill, it would likely include a new margin protection plan and possibly a new supply management program for the dairy industry. Such measures, if enacted, would be major departures from the current dairy program.

Dairy producers' profitability was generally slim but positive during the first two-thirds of 2013, and dairy analysts foresee little change over the rest of the year. For all of 2013, the Class III milk price is expected to average \$17.65-to-18.15 versus \$17.53 in 2012, and early projections for 2014 place the Class III price in the \$17.75-to-18.75 range. Going forward, producers' margins should take a turn for the better when feed prices decline. Dairy farmers should continue to rebuild their herds at the same lackluster-to-slow pace under those market conditions as they were before, but a marked improvement in producers' profitability would spur faster herd growth. And with more cows, the industry will produce more milk and other dairy products, leading eventually to lower dairy product prices.

As long as the U.S. economy continues to grow 2.0-to-2.5 percent a year, domestic consumption of dairy products should also expand, albeit at a slightly slower pace. The mix of dairy products desired by consumers, however, will continue to change with value-added products like Greek style yogurt posting the most dramatic growth and fluid milk demand declining as soft drinks and bottled waters continue to make inroads. Modest domestic market growth is expected for other processed dairy products (e.g. cheese).

Dairy processors' profitability is tied closely to individual product demand. Collectively, their input price risk largely hinges on the price of raw milk. Stock levels provide critical market signals to processors. Current inventory stocks of both cheese and butter are at very high levels, owing to recent weakness in export sales. Indeed, butter prices have lately been depressed, as stocks climbed to levels not seen since price subsidies ended in the 1990s.

Going forward, as feed prices decline and producer margins improve, dairy farmers will step up their efforts to rebuild and expand their herds. Dairy analysts foresee a bigger cow herd, greater milk production, lower milk prices, and improved processor margins. Further bolstering these margins are innovations in the use of isolates and other dairy components and the creation of additional byproducts. For example, Greek yogurt and whey used in sports recovery drinks are two

new innovative products that are gaining traction and expanding domestic consumption of dairy products.

U.S. dairy product exports in June amounted to a record-high 16.5 percent of U.S. fluid milk production on a total milk-solids basis. (This estimate probably understates the actual proportions because of the difficulty in identifying all of the packaged consumer products that contain milk products or ingredients but are not labeled as “dairy.”) The U.S. dairy industry has clearly established itself as a major supplier to the global marketplace, and overseas markets represent the industry’s doorway to future growth and prosperity. Still, further growth in exports will require that products be adapted to foreign specifications and also, for many products, that processors commit to year-round contracts.

Dairy product exports stand out as the U.S. dairy industry’s greatest opportunity – but are also its gravest risk. Exports now represent about 13-15 percent of U.S. milk production, and the U.S. dairy industry clearly has outgrown the domestic market. At the same time, most of the U.S.’s dairy exports are commodities, like butter

and powder, as opposed to niche products with less price-sensitive consumer bases. Hence, the U.S. dairy industry plays the role of residual producer within the global marketplace; and in this capacity, the cyclical ups and downs that occur within these global markets end up having a magnified effect on the U.S. dairy industry.

Other Commodities

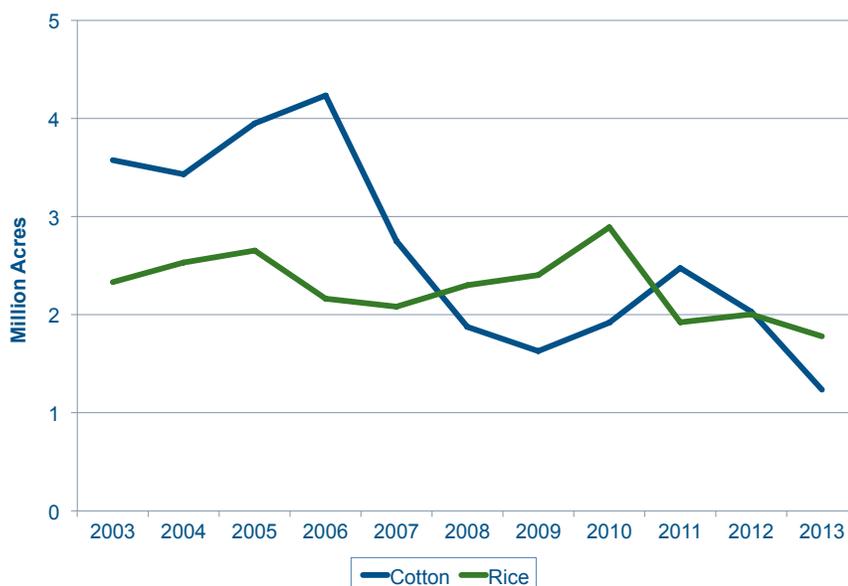
As corn and soybean prices ratcheted to record-high levels in recent years, growers around the country opted to shift their planted acreage toward those crops and away from staples such as rice, cotton, and sugar. As corn and soybean prices recede in coming years, growers will begin to reverse those earlier shifts. However, cotton acreage remains vulnerable.

Cotton

King Cotton’s crown is slipping. In 2013/14, the 5-state mid-South region planted the fewest cotton acres on record (since 1909), and planted 39 percent fewer cotton acres than in 2012. (See Figure 5.) The region’s shift away from cotton is the biggest contributor to the estimated 25 percent decline in U.S. production for 2013/14. Acreage losses in the mid-South were partially offset by gains in a few Southeast states. Texas, which typically plants half of all U.S. cotton area, cut its acreage sown to cotton by 12 percent this year. The result will be a decline in available supply, as the domestic stocks-to-use ratio falls from 24 percent to 21.

In addition to the allure of alternative crop prices, cotton growers also were incentivized to plant fewer fields to cotton by the world supply situation. China initiated a cotton purchasing program in 2011, intended to support prices for its own domestic producers. The program achieved its objective of propping up prices in the short-term, but by purchasing much of the world’s cotton, China’s inventories have grown nearly

Figure 5: Cotton and Rice Acres Planted in the 5-State Mid-South Region



Source: USDA-NASS

six-fold in just the past three years. In turn, the world stocks-to-use ratio has doubled over the past four years, to 87 percent. Other major producing countries, however, are not reducing output as much as the U.S. World production is expected to fall only 3 percent in 2013.

These crosscurrents present a precarious scenario going forward. China announced that it will soon be ending its purchasing program and transitioning to a subsidy-based strategy to support domestic cotton growers. The time line for this transition is unclear, but it is anticipated that China will import about half as much cotton this year as in 2012/13, and that China will slowly begin selling off its cotton inventories within the next year. The pace at which China chooses to sell its extensive stocks will determine the magnitude of its impact on global prices. The transition will be a drag on prices, and could potentially send prices tumbling. A decline in prices would certainly be negative for producers worldwide in the near-term, but lower prices would make cotton more competitive versus polyester, which has maintained a \$0.60 per pound discount to cotton since 2011. Thus, the pain of declining prices in the short run would increase demand and help to bring the world cotton situation into a more sustainable balance for the longer run.

Rice

U.S. rice acreage in 2013/14 also fell. Rice area will fall 8 percent this year to the lowest level since 1987/88. Nearly ideal weather in the Delta states this year is projected to support record yields, which will partially offset the decline in area. Nonetheless, domestic production is expected to fall to the level of 2011, which was the smallest U.S. crop since 1998/99.

All of the decline in output this year will come from long grain production, which accounts for about 70 percent of total U.S. rice production. Combined small and medium grain production, which is mostly grown in California, will rebound slightly from last year's 20 percent decline. Despite the slide in long grain production, output will nearly keep pace with consumption, and the stocks-to-use ratio will decline only marginally. Consistently strong domestic use and exports for small and medium grains, however, will pull

down inventories as the stocks-to-use ratio for the two combined smaller classes falls from 20 percent to 14 percent, the lowest ratio in 15 years. With little change in long grain supplies, prices are expected to change very little from the 2012/13 average price of \$14.40 per hundredweight. Decreasing stocks of small and medium grains should support slightly higher prices than last year, in the \$16.30-17.30 per hundredweight range.

Globally, rice production will rise for the fourth consecutive year in 2013/14, to an all-time high. The gains in output will exceed consumption and boost world stocks to the highest level in over a decade, resulting in downward pressure on world prices. The increase in world production is in part a result of Thailand's purchasing program, which was instituted in 2011 to support higher prices for domestic growers, in much the same way that China has supported its cotton industry. The artificially high price offered to Thai producers created an opportunity for other Asian countries to produce and export larger volumes of rice more competitively than Thailand. Therefore, while Thailand's stocks have tripled since 2010/11, burgeoning Asian exporters are seizing the opportunity to take market share away from Thailand, and also challenge traditional U.S. markets. The divergence between U.S. and world rice supplies will keep the world/U.S. price spread particularly wide throughout 2013/14 and modestly suppress U.S. exports.

U.S. long grain exports, most of which are bound for Latin America, also have met increasing resistance in the past few years, as complaints of declining quality increased. As U.S. growers shifted from using predominately inbred seed varieties to more hybrids, chalk content increased in shipments, and Latin American importers began to shift their sourcing to other competing countries. This problem is unlikely to be resolved in the near-term, but some U.S. growers have shifted back to using inbred seeds, and the rice trade associations continue to work for a sustainable solution.

Sugar

U.S. and global sugar markets are faced with overabundant supplies. Inventory has soared, while

Figure 6: U.S. and World Raw Sugar Prices

Source: USDA-NASS

domestic and global sugar prices plummeted. (See Figure 6.) In fact, in the first half of 2013, the U.S. sugar price fell below the USDA's administered minimum price needed to avoid loan forfeiture.

Domestic U.S. sugar prices have edged upward in the past two months largely reflecting the government's efforts to reduce the sugar surplus. However, prices aren't likely to ratchet too much higher over the next six months, given the market's current oversupplied condition. This year's domestic sugar crop will be smaller than last year's, in response to market signals. In the 2013/14 crop year, U.S. sugar production is projected to contract 3.5 percent YoY to 8.70 million short tons raw value (STRV), with beet sugar declining 2.9 percent and cane sugar falling 4.1 percent.

U.S. sugar imports, however, are projected to increase. They typically supply about 25-30 percent of total U.S. needs and are projected to increase nearly 6 percent in 2013/14 to 3.4 million STRV. This increase in imports will largely counterbalance the projected decline in U.S. production, leaving the total supply virtually unchanged in 2013/14 at 14.3 million STRV (including a beginning stock of 2.2 million STRV). Total use, however, is also projected

to remain essentially unchanged at 12 million STRV. Hence, ending stocks for the 2013/14 crop year are projected to increase to 2.3 million short tons raw value (STRV), up 5 percent from a year ago and equal to a 19.5 percent stocks-to-use ratio.

The USDA is mandated by legislation to stabilize the domestic sugar market, and it customarily tries to do so while minimizing Federal sugar program expenditures. Under this program, the USDA can make loans to domestic sugar processors, but the loans must be liquidated, along with the interest charges, by the end of the fiscal year in which the loans are made. The

loans are nonrecourse. When a loan matures, the USDA must accept either full payment or the sugar pledged as collateral in lieu of cash repayment (i.e., loan forfeiture), at the discretion of the borrower. With sugar prices having recently fallen to levels below the loan forfeiture sugar prices as specified under the Farm Bill of 2008, the USDA has announced several purchase/exchange programs designed to avoid loan forfeitures.

The USDA administers two programs which are designed specifically to manage (and in this case, reduce) sugar imports into the U.S. On June 17, 2013 the USDA announced its intention to purchase sugar from cane and beet processors in exchange for credits under the refined Sugar Re-export Program. Such exchanges reduce imports into the U.S. Shortly thereafter, the USDA announced its decision to permit private sector exporters and traders to exchange Trade Promotion Agreement (TPA) Certificates of Quota Eligibility (CQEs) granted under the U.S.-Colombian TPA and U.S.-Panama TPA for Commodity Credit Corporation stocks. Together, these two exchange programs are anticipated to remove around 350,000 tons of sugar from the U.S. market and will be less costly than sugar loan forfeitures.

In addition, the Commodity Credit Corporation (CCC) administers another government-sponsored program designed to manage the U.S. domestic sugar surplus. On July 29, 2013, the CCC announced the final rule for the establishment of its Feedstock Flexibility Program (FFP). This program is designed to purchase domestic sugar and resell it to bio-energy producers in order to avoid loan forfeitures. In mid-August, the FFP program announced that purchase invitations had been sent to solicit bids from sugar processors with pledged collateral for USDA loans with a maturity date of August 31, 2013. The purchase invitations garnered interest from processors in Louisiana, North Dakota and Nebraska. However, the only actual purchase involved a refined sugar beet processor in Nebraska, for a net expenditure of \$2.7 million. The short reaction timeframe, coupled with transportation issues, likely limited demand for the FFP program.

Domestic sugar prices are still hovering close to loan forfeiture levels. However, the spread between domestic and world prices has widened to \$0.04 after sugar purchase/exchange announcements. Going forward, the USDA's continuing efforts to manage the domestic sugar surplus may succeed in widening the spread further and in lifting the price above the FSA loan forfeiture rate. However, the overabundant domestic and world sugar supplies should prevent prices from rising substantially in the near term.

Specialty Crops

The fall harvest is proving to be bountiful for the specialty crop growers. In particular, this year's crops of apples, almonds and pistachios are expected to be hardy.

Industry estimates project apple production to be 14 percent larger YoY, compared to the 2012 frost-ravaged apple crop across the Midwest and Northeast. Michigan, in particular, is expecting a large crop of 30 million bushels, a large recovery from last year's devastated crop of 2.7 million bushels. Excellent growing conditions, including ample rain, cool nights and plenty of sunshine contributed to Michigan's healthy crop. Washington, another top apple state, is expecting a 7 percent decrease

from 2012's record setting harvest. Still, the 2013 harvest is expected to be the second largest on record.

California's almond and pistachio harvests have also posted strong results. The 2013 almond crop is estimated to be around 1.9 billion pounds, down slightly from last year's 2 billion pound crop. A short, cold spring made for a limited pollination period, while windy weather in the late spring blew off early nut sets in parts of key almond growing areas. Similarly, the 2013 pistachio harvest is expected to remain around 2012 levels, with industry estimates hovering at 550 million pounds. Production estimates for 2013 reflect increasing production from new acreage, even though it is an off-year for mature trees. Pistachio trees older than 10 years are alternate bearing, producing a large crop every other year with 2013 being a small crop year for many trees.

USDA analysts estimate that Florida's 2012/13 orange season, which ends in September, will yield just 133 million boxes, and represents the smallest harvest in six seasons. Drought throughout the Florida peninsula exacerbated the ill-effects of citrus greening, causing trees to prematurely drop fruit. Besides the low yields, Florida's citrus crop yielded low amounts of juice—an important factor since Florida is responsible for 90 percent of U.S. orange juice production. Florida citrus production in the coming year is expected to contract further, according to many industry analysts; and the condition of next year's and subsequent crops will depend critically on the degree of stress imposed on already compromised trees due to citrus greening.

Overseas demand continues to provide promising opportunities for growth within the specialty crops sector. Foreign demand, particularly in developing economies such as China, has increased dramatically in recent years due to rising prosperity in developing populations. Marketing campaigns from specialty crop companies and trade associations have also bolstered export demand. The latest USDA forecasts project fresh and processed exports of specialty crops at \$24 billion in 2014, up 9 percent from 2013. Exports of fresh fruits and vegetables destined for the top overseas markets of Canada and Mexico are expected to continue to grow in coming years.

Exports of tree nuts to China and Europe are expected to remain strong thanks to strong demand for almonds, walnuts and pistachios.

With each passing year, the regulatory environment for the specialty crop industries becomes increasingly burdensome and more costly due to implementation of the FDA's Food Security and Modernization Act (FSMA). The FDA is currently drafting regulations under the Act that will impose stringent safety standards, production practices, and inspection requirements on specialty crop producers and processors. The FDA is under court order to implement final rules under the Act by June 30, 2015. Although the fruits, nut, and vegetables (FNV) growers and processors have long employed practices to safeguard produce against contaminants, FSMA regulations will pose additional compliance burdens for the FNV sector.

Labor scarcity continues to be a major concern to the FNV industries. Congress has failed to pass any comprehensive labor reforms in 2013, and few observers remain hopeful that such legislation will pass soon. Without federal labor reforms, major FNV producing states such as California, Washington and Florida will continue to struggle in securing adequate, qualified labor to grow and harvest labor intensive FNV crops. In response partly to labor shortage issues, many producers, especially in California, are shifting to growing less labor intensive crops such as tree nuts. California's major FNV growing regions have seen large shifts in acreage from annual row crops (such as cotton, or vegetable crops) to almond and pistachio groves. This trend in acreage shifts is expected to continue thanks to strong demand for tree nuts in domestic and foreign markets, as well as the decreased labor requirement of growing tree nuts.

Farm Supply

Net farm income is projected to reach \$120.6 billion in 2013, up 6 percent from a year ago and a new record-high. However, net cash income is expected to fall 10 percent from what it was a year ago, reflecting producers' reluctance to sell their 2013/14 crops during calendar year 2013. These fuller grain bins underpinned a 5.5 percent

“*Crop producers have been reluctant to lock in supplies in a falling price environment as they wait for prices to bottom out.*”

decrease in crop cash receipts. Total farm production expenses in 2013 are expected to increase 3.8 percent to a record \$354 billion. For the past ten years, higher input prices have been the main driver behind increases in production expenditure rather than quantities.

Fertilizers

In recent years, as crop prices climbed to elevated levels and fluctuated wildly, so did crop input prices. Going forward, the grain markets are likely to undergo a dramatic transformation – i.e., switching from a scenario where prices continued to ratchet higher to one where they will ratchet lower – with crop input prices following suit. Grain prices will continue to be volatile, but the degree of volatility should subside as grain inventory stocks swell to the point where they provide greater buffers against price swings. Prices of manufactured crop inputs should perform similarly.

Fertilizer prices have been trending downward since last spring, and ample global fertilizer supplies are likely to weigh on prices moving into the fall application season. Harvest is expected to be delayed due to the late plantings in the spring. However, as we move closer to harvest, warm temperatures could speed things along. If the harvest progresses without much weather delay, the fall application is likely to be robust because crop prices are still historically high enough to induce producers to purchase normal amounts of fertilizer.

Many retailers currently face the challenge of sourcing farmers' commitments for fertilizer volumes. Crop producers have been reluctant to lock in supplies in a falling price environment as they wait for prices to bottom out. With many producers having shifted to a “wait-and-see/just-in-time” strategy, the fertilizer supply chain

may not be able to accommodate a sudden ramp-up of demand. As wholesale prices further deteriorate, retail spreads may widen, but in the near term retailers will have to watch transportation costs closely to ensure that they don't end up having to scramble to secure product and thus impair their margins.

Ammonia prices are now falling, after remaining flat during the first half of the year. Since the start of the third quarter, Midwest index values for ammonia have fallen 20 percent. This may seem like a large drop, but it pales in comparison to the 71 percent price plunge from the high of 2008 to the low of 2009. Large price spikes in the near-term are unlikely unless logistical issues arise during the fall application season.

Urea prices are also trending downward. They have decreased 11 percent since July. Domestic demand remains sluggish as retailers wait for crop producers to book fertilizer in a falling price environment. When demand returns, the urea market could experience some underlying price support due to logistical concerns rather than to shortages in product. Retailers may need to source slightly higher priced urea in the near-term to meet fall application needs with the possibility of prices drifting slightly lower into the spring application season.

Mid-Corn Belt UAN prices began to subside in the third quarter. Continued price slides are limiting producer purchases for UAN, just as they are for many other kinds of nitrogen. UAN prices have declined 20 percent since the start of the third quarter. Dry conditions in Texas have curtailed demand for UAN during this time frame. At the same time, UAN production margins continue to be strong and may limit upside price potential from supply shortages in the near-term.

Similar to the nitrogen markets, phosphate demand has been subdued in recent months. Phosphate prices continue to decline, and crop producers continue to defer their purchases. In fact, phosphate prices have retreated about 7 percent since the start of the third quarter. As the fall application season gets underway, prices may drift slightly lower, but should begin to level off.

The big news in potash markets in recent months has been the breakup of the potash marketing agreements

between Russia and Belarus. Belarusian Potash Company (BPC) and Uralkali, a Russian potash company, dissolved a marketing arrangement following unapproved outside sales of potash by Belarus. It is estimated that BPC represented around 43 percent of the global potash market. As the two potash companies now compete against each other, potash prices will likely fall. Rumors have been rife since the dissolution with talk about new ownership structures and renewed agreements; however, many commentators doubt that BPC will return to its original partnership anytime soon.

The advantages of low cost potash production will likely be tested as developments continue moving forward into the coming season. Delays on expansion projects and the economics of potash fertilizer production will call for expense discipline to ensure survival of high cost potash producers in the market. Since the news broke, prices for potash have fallen around 12 percent, and lackluster demand for potash continues to weigh on domestic prices. Retailers are reluctant to build inventory amidst falling prices and are generally making their purchases on an as-needed basis. In the near term, potash prices will likely continue to decline.

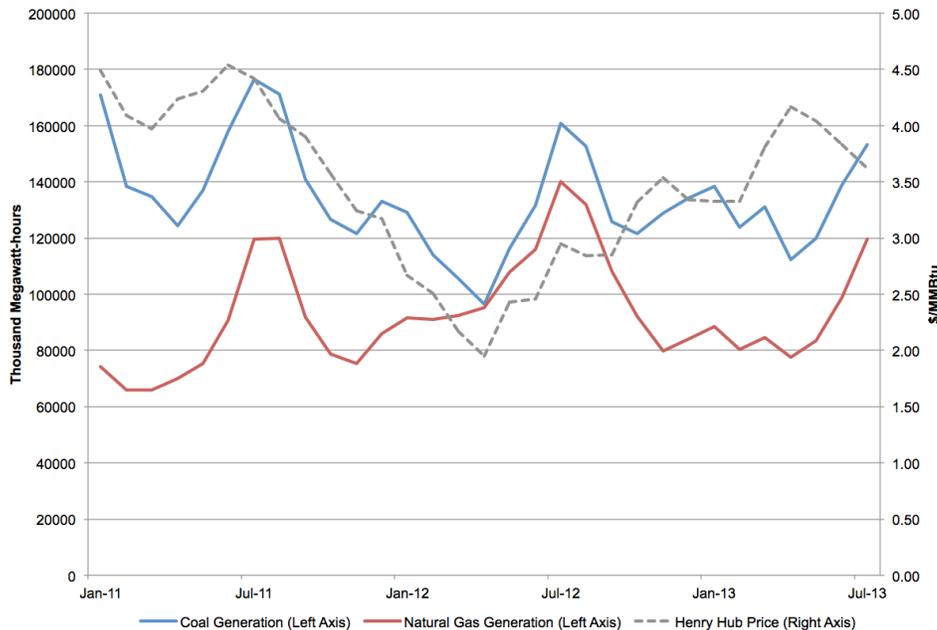
Other Crop Inputs

Continued robust planted acreage for corn and soybeans and improved genetics will likely keep seed expenditures on an upward trajectory through the next season. Seed prices are expected to increase 5 percent in 2013. Drought relief throughout much of the U.S. Corn Belt will likely alleviate some of the concerns for seed supplies as we move closer to planting season this spring.

High commodity prices influence the farmer's willingness to purchase and apply appropriate amounts of insecticides and herbicides to reach optimum yield targets. Prices paid for herbicides are expected to edge up 2 percent while prices for insecticides are expected to increase 4.6 percent in 2013. Total pesticide expenses are expected to rise about 1 percent YoY.

Fuel and oil expenses are expected to decline 1.2 percent YoY to \$15.5 billion in 2013. Off-road diesel is the main fuel for field equipment, and crude oil accounts for about two-thirds of the price of diesel fuel. The U.S.

Figure 7: Coal and Natural Gas Generation vs. Henry Hub Prices



Source: U.S. Energy Information Agency

Energy Information Administration (EIA) is projecting that the average price of on-highway diesel fuel will be \$3.89 per gallon in 2013 and will edge down to \$3.76 per gallon in 2014.

Rural Infrastructure

Power and Energy

While U.S. long-term demand for electricity appears to have ceased growing, the nation's power and energy industries will be anything but quiescent during the coming year. Significant retirements of the U.S. coal fleet are scheduled for the next year (and beyond), and natural gas will fill a large majority of the gap left by coal retirements. Getting the needed gas moved from the newly emergent shale basins to the nation's population centers continues to require massive investments in the midstream gas infrastructure. At the same time, tax credits, state-level subsidies, and renewable portfolio standards (RPS) continue to support the growth of utility-scale and customer-scale renewable power generation. Regulatory uncertainty concerning mandates for coal generation continues to be a problem

for investor owned utilities (IOUs), cooperatives and other generation and transmission owners.

Natural gas prices are not likely to climb much higher, if at all, during the next year, following their dramatic run-up during the past year and a half. After bottoming out at \$1.82/million British thermal units (MMBtu) in mid-April 2012, Henry Hub natural gas prices rose to \$2.75/MMBtu on average in 2012. The Energy Information Agency (EIA) projects gas prices to average around \$3.68/MMBtu in 2013 and then edge up to \$3.91/MMBtu in 2014. However, as summer temperatures subside and natural gas consumption enters the doldrums, also known as "shoulder

season," prices are more likely to decrease rather than increase through the fall months.

Year-to-date through July, overall net power generation remained essentially flat YoY. However, during this same period, coal-fired generation increased 7.5 percent while gas-fired generation decreased 13.9 percent. Coal consumption from the power generation sector will be close to 877 million short tons (MMst) in 2013, increasing to 890 MMst in 2014. The recent increases in coal-fired generation have been driven mainly by the run-up in natural gas prices through 2013. (See Figure 7.) The majority of coal-fired plants that have been dispatched in response to higher natural gas prices have already come online. With natural gas prices projected to be stable for the remainder of 2013 (i.e., on a seasonally adjusted basis), the pace of gas-to coal switching through the rest of 2013 and into 2014 should be slower than it was during the first two-thirds of 2013.

In response to mounting federal regulations, most notably the Mercury and Air Toxics Standards (MATS), approximately 45,000 MW of existing coal-fired generation have been announced for retirement by 2016. Most of

the plants scheduled to retire are older, inefficient, and have relatively small generating capacities. Retrofits such as scrubbers are either physically impossible to install in small plants or the increased costs render these inefficient plants uneconomic.

Going forward, newly constructed coal-and gas-fired plants will have to comply with the stringent Clean Air Act standards proposed by the Environmental Protection Agency (EPA) on September 20, 2013. New plants will have to be built with carbon emission reduction technology, such as carbon capture and storage (CCS). The American Coalition for Clean Coal Electricity maintains that the new rule will in effect “ban the construction of new coal plants.”

At present, most industry insiders believe that CCS technology is not yet commercially viable and indeed is prohibitively expensive. Consequently, following the EPA’s latest set of rules regarding newly built power plants, the power-generation industry will invariably choose to invest in lower-cost natural gas generation and discontinue its research and development of CCS technology. Such a choice, however, would be short sighted, given the nation’s vast reserves of coal and also given the power-generation industry’s need for a diverse portfolio of generating facilities that can be dispatched based on market conditions.

The Baker Hughes natural gas rig count totaled 401 as of mid-September, representing a 6-month high, but the rig count was still down 11 percent YoY. The recent rig count gain appears to be a result of the increased investment in natural gas infrastructure, especially in the East. Despite the YoY reduction in drilling, gas production has not slowed much from the record high hit last year, mainly supported by associated gas produced from more profitable shale oil and shale gas liquids wells.

The EIA reported that U.S. crude oil production in August hit the highest monthly level in 24 years, putting U.S. producers on track to generate the largest annual growth rate in the history of U.S. oil production at 15.1 percent, or 7.5 million barrels per day. Industry experts unanimously agree there is far more potentially productive oil shale in the U.S. than anyone ever thought possible.

Despite increased domestic production, global oil prices remain stubbornly high. Brent crude and West Texas Intermediate (WTI) crude spot prices climbed steadily through the third quarter and currently trade at \$109 per barrel and \$106 per barrel, respectively. Global Brent crude prices will continue to remain more sensitive to potential supply disruptions in the Middle East; however, strong domestic oil production dampens the impact of foreign supply shocks on WTI spot oil prices. Depending on events in Syria, the spread could widen dramatically.

Record production from shale oil and gas reserves is proving to be the largest driver of increased investments in the midstream infrastructure sector. Over the past five years, annual investment spending for midstream infrastructure was nearly double what it was from 1992 to 2006. North America’s existing oil and gas pipeline grid was built primarily to move gas from the Gulf Coast, the southwestern U.S., and western Canada to the major population centers throughout North America. However, the newly discovered shale basins all lie in areas of the country that were previously unproductive for well-drilling and thus largely bypassed by the existing network of natural gas pipelines. In an attempt to provide an outlet for vast volumes of shale oil and gas, the direction of flow in many existing pipelines is being reversed.

- Operators of the Seaway pipeline, with a capacity of 400,000 barrels per day, recently announced their intentions to double capacity by early 2014. For years, the Seaway pipeline transported crude oil from the Gulf of Mexico to Cushing, OK, the main trading hub for U.S. crude oil and the price settlement point for WTI on the New York Mercantile Exchange. In June 2012, operators reversed the direction of flow in Seaway, significantly reducing the glut of U.S. crude oil in Cushing, OK.
- The Rockies Express Pipeline (REX) is the largest U.S. natural gas pipeline built in the last 20 years and extends 1,700 miles from Colorado to Ohio. It was built to deliver Rocky Mountain natural gas to large population centers in the Northeast. However, prolific production from Appalachian shale basins has significantly reduced deliveries from the REX

to the East. In July, owners of the REX confirmed a binding agreement with a large Utica shale producer to use the pipeline to supply 200,000 decatherms (i.e., 1 decatherm equals 100,000 British thermal units) of processed natural gas per day to Midcontinent customers, according to RBN Energy.

The reversal of the REX and Seaway pipelines points out the significant supply/demand imbalances that have come about because of domestic shale production. Going forward, the current supply side constraints will continue to be eased with massive capital investment in midstream infrastructure.

Additional photovoltaic (PV) solar installed capacity totaling 4,400 megawatts (MW) is scheduled to come online in 2013, with almost 1,500 MW of new capacity installed during the first nine months of the year. Dramatic reductions of the average installed costs for PV systems are driving this growth. In fact, installed costs for all sectors are down 40 percent since 2011. The utility sector will account for the largest share of PV installations this year with 55 percent, followed by the residential and non-residential sectors at 27 percent and 18 percent, respectively.

Residential PV growth has been flat through most of 2013 due to reductions in state incentives. However, California continues to lead the country in residential PV installations reaching rate parity with support mainly from the federal investment tax credit (ITC) and net metering. California is seen as a leading indicator for growth in solar distributed generation (DG) across the country. Based on preliminary EIA data, the number of residential net-metering customers grew to approximately 297,000 nationwide in 2012. This represents a very small proportion of total residential customers (well below 1 percent) but the 2012 number is a 60-fold increase relative to the 5,000 net-metered customers in 2003.

With the growth in DG, a number of utilities are moving towards revising, capping, or removing net metering. The net metering debate will play out differently across the country and has the potential to be the largest roadblock to exponential growth in DG. For example, New York tripled its net metering cap from 1 percent to 3 percent

of 2005 peak demand. However, APS in Arizona and Xcel energy in Colorado have submitted proposals to limit or remove net metering.

Massive installations of wind-powered capacity were completed in late 2012 to meet the Production Tax Credit deadline. Construction activity since then has fallen sharply. Installed wind capacity currently totals around 60,000 MW, essentially unchanged from year-end 2012.

According to the American Wind Energy Association, construction activity has begun to pick up, with utilities issuing at least 22 Requests for Proposals for wind or other renewable projects. Since January, more than 3,950 MW of long-term power purchase agreements have been signed, and utilities have announced more than 1,300 MW of self-builds. As of June 30, 2013, 1,280 MW were under construction in eight states. The U.S. wind industry is gearing up to meet strong demand for more wind energy going forward.

Water

Water utilities today are focused on addressing pressing issues related to aging infrastructure and securing the financing required for these improvements.

Based on a report from Water Utility Infrastructure Management, cost estimates for needed infrastructure improvements range from hundreds of billions to trillions of dollars by 2035. Going forward, lining up the funding for this massive renewal of water and wastewater infrastructure will be the primary focus for many utilities. According to the American Water Works Association, the issuance of bonds by water and wastewater utilities in the U.S. has ballooned to approximately \$36.5 billion from \$22 billion in 2010. However, the ability of municipal managers to take on new debt, even if it is available, will be put to the test given high state and municipal deficits. According to the National Association of Clean Water Agencies, long-term debt among water utilities is up over 75 percent since 2001.

The current tight fiscal climate has also reduced federal funding of rural water projects across the country. For example, the Bureau of Reclamation set aside \$40 million in the 2014 Water and Related Resources budget

for rural water projects. Approximately 45 percent of rural water funds will go to tribal projects, and what remains will be dispersed among five existing water system projects. The 2014 allocations for all but one of these projects have been reduced from 2013 levels. In many cases, the 2014 funding is barely enough to keep projects current and far below what is required to complete the construction of an entire water system.

As they contemplate their daunting funding requirements, water utility executives are closely watching three recent proposals now being considered in Washington, D.C.:

- Proposals to streamline the federal tax code by capping or eliminating tax expenditures, including the tax exemption of municipal bonds, pose a challenge to the industry. A 28 percent cap on the benefit of the tax exemption is in the President's FY2014 Budget request. Tax-exempt municipal bonds are a critical financing tool for municipalities across the country. According to a report published by the National Association of Clean Water Agencies, if a 28 percent cap was placed on the \$39 billion in tax-exempt water and wastewater bonds issued in 2012, it would have cost municipalities approximately \$6 billion in additional expenses.
- Various public and private industry organizations have been rallying behind the proposed Sustainable Water Infrastructure Act for several years. According to the Sustainable Water Infrastructure Coalition (SWIC), this Act would open the door for up to \$5 billion annually in private investment in public water and wastewater infrastructure projects by removing these projects from the state volume cap on private activity bonds (PABs). PABs are a form of tax-exempt financing that encourages state and local governments to leverage private capital in meeting public needs. The IRS annually determines the PAB volume caps for each state. Currently it is \$95 per capita or \$284.56 million, whichever is greater.
- The Water Infrastructure Finance and Innovation Act (WIFIA) was presented to the Senate in February 2013. The WIFIA addresses large funding gaps

“*Water utilities, water districts, municipalities, and water agencies across the country are keenly aware of the pressing need for improved water and wastewater infrastructure.*”

in both regional and national drinking water and wastewater projects. Funding for small projects would be excluded under this program, with a minimum loan amount of \$20 million. Eligible entities will have to meet stiff selection criteria, and the accepted projects will be placed in a priority system and weighted based on pre-defined requirements.

Water utilities, water districts, municipalities, and water agencies across the country are keenly aware of the pressing need for improved water and wastewater infrastructure. Access to capital is critical. Water and wastewater utilities are finding that they can still obtain federal loans and grants for their infrastructure projects, but often at less than adequate levels required to complete many rural water projects. In some cases, municipalities and water districts are delaying projects to wait for more government funds rather than tapping the capital markets. However, given the current inhospitable federal fiscal climate, these water infrastructure projects could potentially be delayed for years to come.

Communications

Swift deployment of new technologies at affordable price points and ubiquitous broadband access are fostering rapid and profound changes in how enterprises and consumers utilize communications services. These changes have unleashed voracious demands for connectivity and access to personalized data anywhere, anytime, and on any device. According to a recent White House study, 94 percent of homes in the U.S. now have access to broadband speeds of at least 10 megabits per second, and the average wireless broadband speeds

have doubled since 2009. Additionally, during this same time period, the percentage of Americans with access to wireless broadband jumped from less than 20 percent to more than 80 percent.

In light of such abundant access, it is no surprise that there are now 500 million Internet-connected devices in the U.S. Analysts forecast that by 2017, 86 percent of in-home broadband traffic will come from smart devices. In turn, the communications industry continues to migrate to an Internet Protocol (IP) ecosystem to cash in on the opportunities that accompany this shift.

The migration to an all-IP network, however, involves much more than upgrades to the industry's existing network infrastructure. To survive and flourish, communications companies must look beyond delivering connectivity and discover how to become competitive service providers in an IP-enabled world. Indeed, a competitive communications service provider will have to deliver not just connectivity, but also value-added, IP/cloud-based services such as enhanced data services, security and home/lifestyle management tools, over-the-top products and IT infrastructure to name a few.

Specific segments of the communications industry, including data center and fiber transport companies, will readily adapt to the coming trends because they are IP-based business by nature, and many IP-based services are natural extensions of current service offerings. In contrast, many of the rural local exchange carriers (RLECs), cable companies, and wireless providers are finding it difficult to develop the same kind of IP-based, value-added services that will allow them to remain relevant and competitive. Many of the companies in these segments have succeeded in creating IP-enabled networks. Where they fall short, however, is in developing the value-added IP/cloud-based services required to function as truly competitive players in this space.

Regulatory changes will continue to place a heavy burden on the RLEC sector in the near-term. The third quarter turned out to be more eventful on the regulatory front than expected, with two of the five Commissioner seats vacant at the Federal Communications Commission (FCC). Positive developments included (a) an FCC Order

to essentially freeze support caps at current levels, thus providing carriers with greater clarity for rate-of-return levels through 2014; and (b) pro-rural revisions to the cost model that will be used to determine support levels in the future. The FCC also awarded \$386 million in one-time support to several carriers to deploy broadband service to underserved and un-served areas. However, these short-term wins do little to provide long-term predictability for RLECs.

As federal support mechanisms ratchet down each year, analysts suggest that RLECs in the most remote areas of the country, where IP-based networks struggle to make a stand-alone business case, will eventually be unable to operate without sustainable and predictable support revenues. If RLECs are forced to sell or shut down, some rural areas could be left without a communications provider. The FCC must still address this scenario, as one of its main missions is to ensure that all Americans have access to reasonably priced communications services.

The nominations of Tom Wheeler for the FCC Chairmanship and Michael O'Rielly for the fifth Commissioner seat compound regulatory uncertainty in the coming months. While both candidates have a good understanding of the communications industry, neither is known for his alignment with the rural perspective. Uncertainty regarding these new players and the associated long-term implications for regulation augurs for little investment in existing infrastructure and very few merger and acquisition (M&A) transactions in the coming months.

Many RLECs started the shift to an IP network and a business plan that relies upon non-regulated revenue years ago. In most areas, demand and behavior warranted this move. Landline providers, both urban and rural, experienced declines in access lines for nearly 15 years. FCC data reveal that landline voice service declined nearly 5 percent in the last six months of 2012 alone, while broadband service adoption is no longer counterbalancing wireline losses. New service opportunities that come with IP enablement will be the catalyst for future RLECs' sustainability and growth. In addition to the services mentioned above, carriers may

also pursue complementary services such as in-home IT support, device repair/replacement plans, and data mining. Operators that are successful in replacing regulated income with non-regulated revenues in the short-term will be well positioned to become the IP communications providers of tomorrow.

Cable providers face similar challenges because the revenues from their higher-margin broadband business cannot absorb other losses much longer. While skyrocketing content and retransmissions costs have transformed video into a low-margin product, broadband has allowed the cable segment to remain surprisingly healthy. However, as competition from over-the-top content providers allows video subscribers to cut the cord and wireless broadband substitution also gains ground, it is clear that the traditional cable model is no longer sustainable. As 83 percent of American households rely upon cable or satellite for their entertainment, the cable industry will remain stable in the near term. However, cable providers will need to make additional network investments, augment service offerings, and rework business plans in order to stay in the game for the long haul.

Growing demand from smart devices easily justifies the network upgrades necessary to reach an all IP network for wireless carriers. For example, wireless data usage from Apple's iPad grew four-fold in the first half of 2013, earning a spot on the list of the "Top 10 Most Data-Hungry Devices," an honor previously held exclusively by smartphones. To meet this steady rise in demand, wireless carriers must gain more access to spectrum, relying largely upon the federal government to release additional spectrum. In the coming months, rural carriers will focus on gaining favorable terms in upcoming auctions for spectrum and network deployment support.

Though the government is working to release more spectrum, recent auction procedures made it difficult for smaller players to participate. The top carriers in the U.S. have had to turn to acquisitions to gain spectrum and growth in the near-term. If approved by regulators, the transactions announced in the second and third quarters of 2013 will transition nearly 40 million U.S. wireless subscribers from Tier 2 to Tier 1 providers and largely

eliminate the regional wireless carrier market. Consumer and rural advocates caution that these acquisitions threaten to reduce competition and increase wireless service prices nationwide. In the coming months, rural carriers may gain a competitive foothold with device trade-in programs that have been recently introduced. However, rural players will need to forge partnerships among themselves, and with at least one large carrier, to be in a position to take advantage of steady demand growth both in the near-term and in the more distant future.

Though M&A volume and valuations among data centers softened in the first nine months of 2013 from previous years, demand for data center services continues to increase as enterprises and consumers embrace the benefits of cloud computing. Despite a boom in data center construction in the past several years, demand continues to outpace supply. This trend is expected to continue for years to come. However, as this market moves towards maturity and technology evolves, data center operators must look to increase efficiency, stability and redundancy as well as branch out into new cloud-based services to maintain a competitive edge. New competition from non-facilities-based cloud providers may become more prevalent in the coming months. Moderate M&A activity is expected, though the bulk of the data center growth will come from increased traffic and the addition of new cloud-based services.

Following two years of heavy M&A activity in 2011 and 2012, fiber transport deals have tapered off in 2013. The deal-flow over the past several years has eliminated a majority of the smaller, localized players, creating a handful of providers, most of which now boast a national presence. Near-term growth in this segment will come from increased Internet traffic. The sector may also spur some growth via acquisition, build-outs and diversification. Despite the lull in transaction activity, this group will remain strong in the short-term due to ever-increasing demand. Diversification strategies could also prove to be a catalyst in this sector, especially if companies delve into complementary services such as data center offerings. ■

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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