Grain, Oilseed and Fiber Crop Outlook

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The period of historic commodity prices during the last decade for the grain, oilseed, and fiber crop markets has quickly changed to an environment of depressed prices and concerns over the financial health of the industry moving forward. A series of significant supply and demand shocks, along with favorable macroeconomic conditions, converged perfectly to create a period of historic profitability and prosperity for the agricultural sector. This period of high prices also helped promote significant production expansion, increased farm input demand, and intensive capital investment. Unfortunately, the cost and debt structures that have been created are ones that are not likely sustainable with a return to lower commodity prices. Adjustments will likely be needed in farming operations to maintain long-run profitability. The level of adjustments needed will be, in part, a function of the persistence of this low price environment. A pro-longed period of low commodity prices will likely necessitate significant changes in production, investment, and marketing strategies.

Major Determinants of Price Movement over the Past Decade

The beginning of the rise in commodity prices during the last decade can be traced back, in large part, to the *Energy Policy Act of 2005* and the first Renewable Fuel Standards (RFS 1). This legislation essentially created a significant new market for grains and oilseeds by mandating biofuel blending of 4 billion gallons in 2006 and up to 7.5 billion gallons by 2012. The market was enhanced with the passage of the *Energy Independence and Security Act of 2007* which provided more ambitious and expanded blending targets for biodiesel, cellulosic ethanol and advanced biofuels. The second Renewable Fuel Standards (RFS 2) for conventional corn ethanol was slated at 9 billion gallons blended in 2008 increasing step-wise to 15 billion gallons in 2015. As a result, the amount of corn used for food, alcohol, and industrial (FSI) purposes has gone from roughly 20% of total corn use

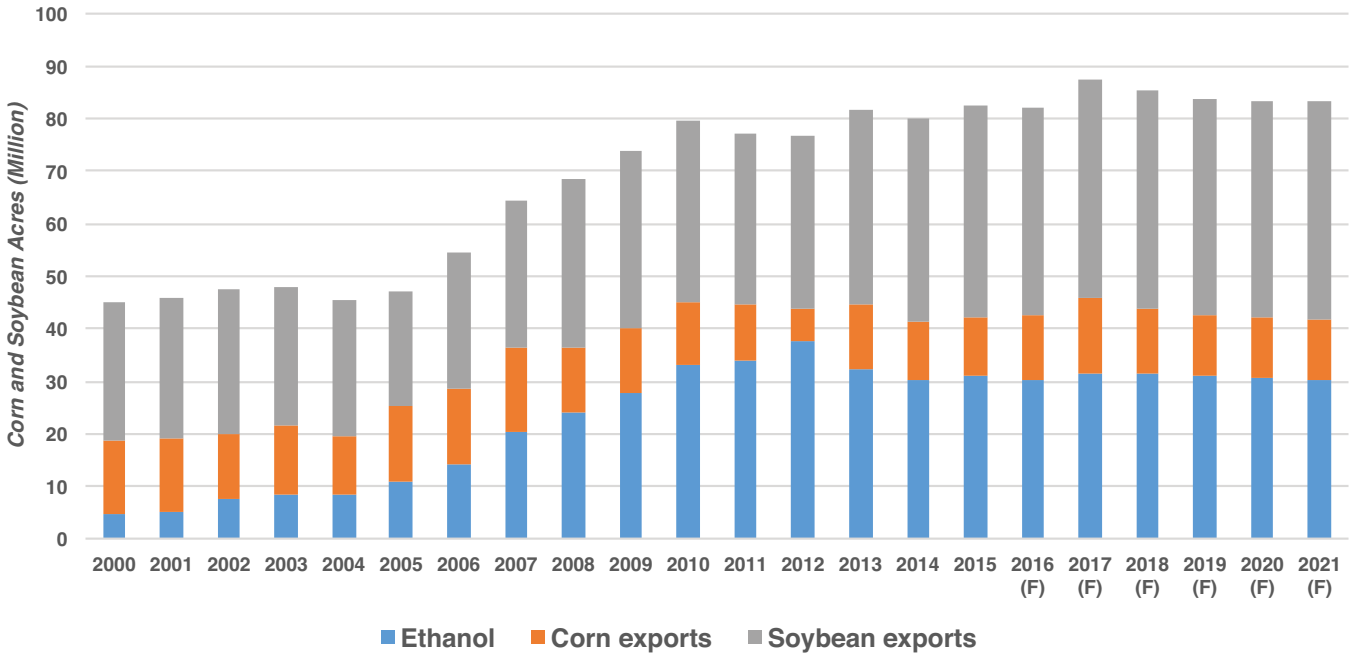

Figure 1. Corn and Soybean Acres Needed to meet Export and Biofuel Use (2000 – 2021F) (Million Acres).
Source: USDA-World Agricultural Outlook Board. FAPRI.

prior to passage of this energy policy to now representing more than 45%.

This new demand source for corn created both a significant shift in crop acres as well as an introduction of new production acres from conservation and idle acres as producers looked to expand corn production. At the same time, drastically stronger world soybean demand, driven primarily by China, created a need for additional soybean acreage and production (Figure 1). Increased domestic and global demand helped to fuel intensive market competition between commodities in attracting crop acreage. Weather related production shortfalls around the world during this time period also helped to continue tighten the supply and demand balance for many commodities and a significant downturn in the strength of the US dollar helped place US commodities in a more competitive position in world markets. Collectively, these factors resulted in extremely positive balance sheets for many commodities and helped maintain strong prices for several years.

The Federal Reserve has kept interest rates low and increased the supply of dollars in the economy to stimulate economic growth which has also contributed to the higher commodity prices. History has shown that low interest rates and increased money supply policies can have a significant impact on commodity prices. Lower interest rates drastically reduced the costs of holding inventories for commodity users. This creates an incentive to hold larger-than-normal inventory levels as protection against future production disruptions and, as a result, raises the overall demand for the commodity. In addition, lower interest rates and increased money supply both help to lower the value of the dollar which effectively lowers US commodity prices in the world market and helps bolster demand. Finally, lower interest rates and reduced investment returns create incentives for hedge funds and portfolio managers to search for higher yielding investments which the commodity markets were providing during this period of record profitability. As investors began to increase their speculative presence, the influx of money into markets helped to reinforce what were already strong commodity prices.

Implications of High Commodity Price Period

Many of the concerns currently facing the agricultural industry can be traced to the financial environment created during the period of record profitability and prosperity for the agricultural industry. While production costs tend to increase over time due to inflationary pressures, growing commodity demand and the resulting production expansion helped push input costs higher at a faster-than-normal pace. Agricultural producers, attempting to maximize yields and production, expanded acreage and increased the use of agricultural inputs. This created a significant increase in input demand and helped increase production costs at a higher rate than had been seen prior in periods (Figure 2).

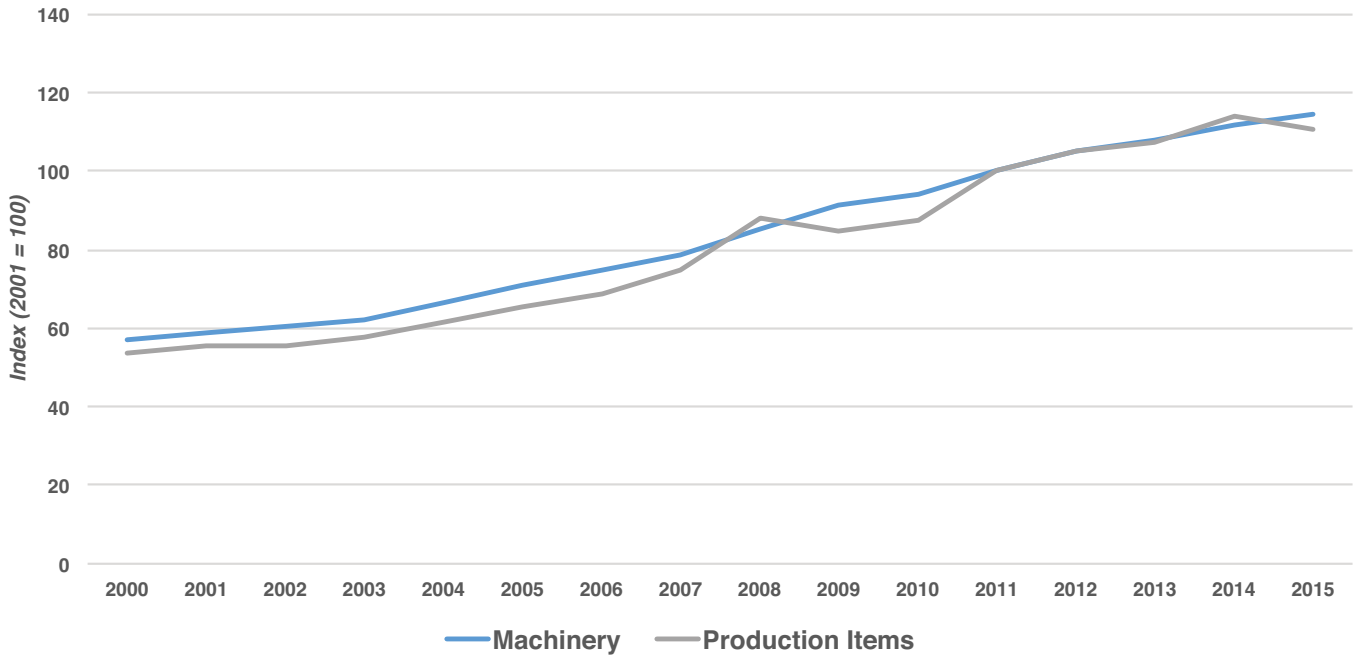

Figure 2. US Prices Paid Index (2000 – 2015).
Source: USDA-Economic Research Service.

High commodity prices, increased profitability, and historically low interest rates also created significant incentives for capital investments in land and machinery. Favorable income tax depreciation rules also made capital investment purchases an attractive strategy to minimize tax burdens in light of high farming profits. Collectively, these incentives expanded capital investment, created additional demand and resulted in higher prices for items such as land and machinery. Higher land values and strong farming profits fueled land rent costs to historic levels. The costs of these items are adjusting downward in light of lower commodity prices and lower overall input demand. The question then becomes will these adjustments happen quickly enough to mitigate some of the financial issues facing the industry? While commodity prices can experience dramatic price swings, history has shown that production costs tend to be more resilient and adjust downward slowly overtime.

As long as commodity prices remained at elevated levels, the concerns regarding the increased cost and debt structures facing farming operations were somewhat limited. However, as commodity prices have fallen back to levels closer to their long-run averages, the cost structure facing many agricultural producers has become a significant concern for the long-run economic viability of the operation (Figure 3). Simply put, cost and debt structures created by $6.00/bu corn and $14.00/bu soybeans are not sustainable long-term with current prices that are closer to $3.00/bu and $9.00/bu for corn and soybeans, respectively.

The exact nature and extent of the financial implications of this new market environment will be dependent on how effectively producers can make adjustments in their operations and the longevity of this low price period. Payments under the Price Loss Coverage (PLC) and Agriculture Risk Coverage (ARC) programs will provide additional cash flow in response to lower commodity prices. However, these payments simply will not fully compensate for the significant reduction in prices faced by many commodities. These payments are also made one-year after the crop is harvested and will not immediately improve the farm's cash flow. Several more years of low commodity prices while likely continue to erode producer's equity and create significant cash flow and financial challenges for many farming operations. Conversely, a return to levels close to those seen during the last decade would mitigate many of the farm financial concerns.

Current Market Condition and Outlook

One risk associated with periods of high prices and profitability is falling into the trap of assuming that markets will maintain at these levels and that downside price risk is

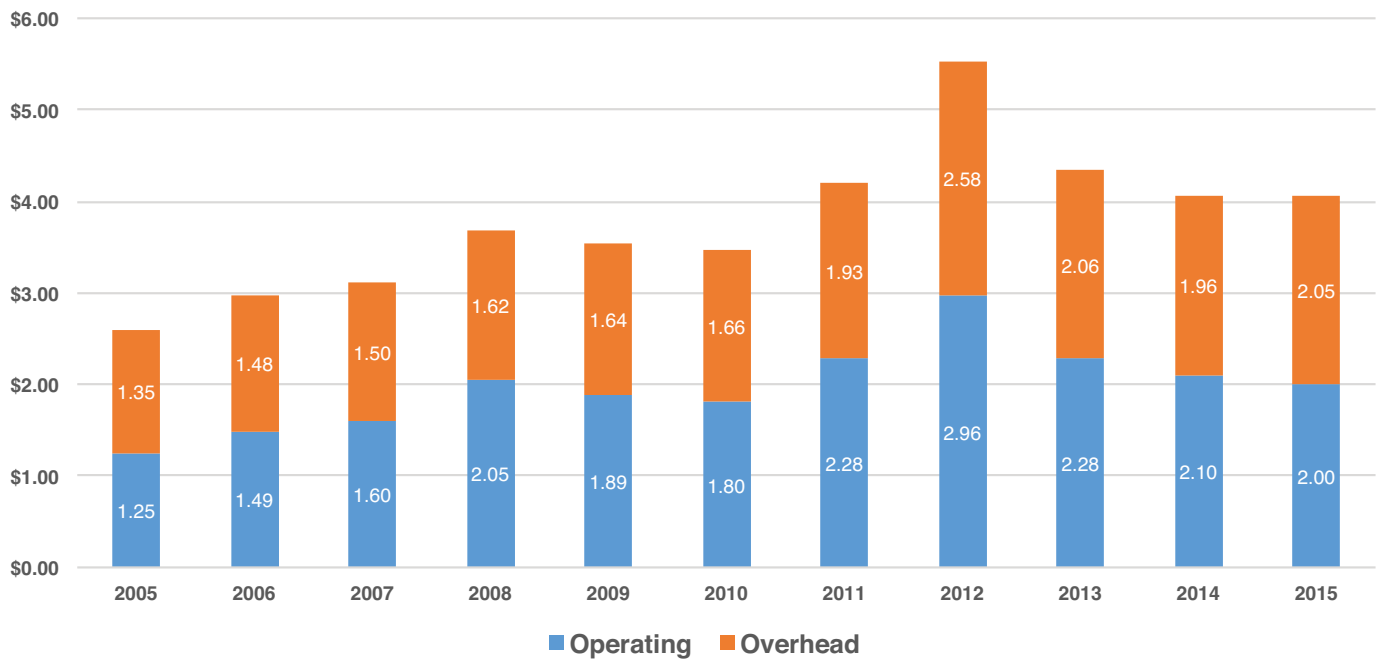

Figure 3. Break-Even Prices needed to cover Operating and Overhead Costs, US Corn Production, 2005 to 2015 ($/bushel).
Source: USDA-Economic Research Service.

limited. The reality of commodity markets is that they are very cyclical. The factors that create periods of high prices can change quickly and be the same factors that now create significantly lower prices. While the growth in demand for grains and oilseeds that was at the heart of the high price still exists, there has been a noticeable slowdown in the rate of that growth. A reduction in motor-fuel demand due to unfavorable economic conditions in the United States has helped limit the growth in biofuel production. Reduced gasoline demand has effectively created a blending-wall for ethanol production as insufficient demand has existed to meet the 10% ethanol blending rate. In addition, slower growth in China's economy and increased competition from South America has slowed the growth in US soybean export demand.

Continued acreage expansion and favorable weather conditions have resulted in consecutive years of record or near record domestic production which has simply outpaced the growth in demand. This has turned the supply and demand balance sheets for many commodities from ones characterized by low supplies and stocks to ones now highlighted by record supplies and burdensome stock levels. In addition, some of the macroeconomic conditions that were conducive to high commodity prices are slowly starting to erode. While still historically low, interest rates have started to move higher. The Federal Reserve raised interest rates in December 2015 with many feeling they will continue to slowly raise rates over the next year. In addition, changing monetary policies along with events such as Great Britain's decision to leave the European Union have started to impact the strength of the US dollar. From January 2014 to July 2016, the US dollar has appreciated in value by nearly 19% as measured by the nominal board dollar index. While these factors do not have the same impact on commodity prices as the fundamental supply and demand shocks, they do describe an environment that has become less favorable for high commodity prices.

Given the shifts and changes in supply and demand fundamentals along with other market drivers, there is little debate that the tone of commodity markets has definitely weakened. Looking at the most recent USDA baseline commodity projections gives some indication of how long these softer markets may exist. USDA projects commodity prices for several years in the future based on current projections and assumptions regarding supply and demand conditions as well as macroeconomic indicators. Table 1 shows marketing year average prices for selected commodities from 2013 to 2015 along with projections from 2016 through 2021. Recall that commodity prices began to see marked improvement in 2005 and 2006 and then reached a high point in either 2011 or 2012. From that time, prices have started to trend lower, and in some cases, to levels that rival the pre-2005 period. Other than for rice prices, which are projected to see gradual price improvement over the next five years, commodity prices are projected to remain mostly unchanged with prospects of only marginal improvement. An important note about these projections is that they do not assume supply shocks resulting from weather related production shortfalls. As was seen in 2012 and, to some degree in 2016, supply shocks can significantly impact prices, even if only momentarily.

Corn

High corn prices were driven primarily by increased demand resulting from biofuel production mandates. While biofuel production continues to be a strong demand point for corn, its rate of growth has slowed over the past several years. In addition, corn feed use has varied over the past several years as livestock inventories have varied. The one thing that has not varied, however, is the expansion of corn production in the United States. From the drought year in 2012, corn production has been at or near record levels for each consecutive year. Simply put, the expansion in corn production has outpaced the growth in demand creating higher stock levels and pressuring prices. This trend continued in 2016 as an additional 6 million acres of corn were planted in the United States. While larger livestock numbers and improved export demand due to production shortfalls in competing countries once again points to expanding demand, the prospects for even larger increases in supplies have kept downward pressure on prices. The market will likely have to work its way through the current large levels of domestic and world stocks before any appreciable and sustained price improvement can occur. The brief increase in prices during the spring and early summer of 2016 should be a sign that this market is and will continue to be sensitive to the potential for supply disruptions. Without these, however, it appears that it will require a few years of lower prices to result in more manageable domestic and world supply and stock levels.

Grain Sorghum

Traditionally, the grain sorghum market has taken its direction from the corn market. And for much of the last decade, it was able to ride the momentum created by the corn and oilseed markets to favorable price levels and strong profitability. Spillover demand created from historic corn prices helped improve the overall supply and demand fundamentals and helped to support grain sorghum prices

Table 1. US Marketing-Year Average Farm Prices from 2013 to 2020(F) for Principal Crops.

	2013	2014	2015	2016 (F)	2017 (F)	2018 (F)	2019 (F)	2020 (F)	2021 (F)
Corn ($/bu)	$4.46	$3.70	$3.60	$3.20	$3.57	$3.80	$3.87	$3.86	$3.87
Grain Sorghum ($/bu)	$4.28	$4.03	$3.30	$3.05	$3.26	$3.49	$3.57	$3.57	$3.57
Soybeans ($/bu)	$13.00	$10.10	$8.95	$9.05	$9.44	$9.64	$9.94	$9.93	$9.99
Wheat ($/bu)	$6.87	$5.99	$4.89	$3.60	$4.52	$5.02	$5.28	$5.34	$5.38
Upland Cotton ($/lb)	$0.779	$0.613	$0.580	$0.630	$0.594	$0.615	$0.622	$0.620	$0.629
Peanuts ($/lb)	$0.249	$0.220	$0.193	$0.189	$0.187	$0.190	$0.196	$0.198	$0.199
Rice ($/cwt)	$16.30	$13.40	$12.20	$10.70	$11.21	$11.60	$11.60	$11.74	$11.78

Source: USDA-WAOB. September 12, 2016 Projections for Marketing-Years 2015 and 2016 (F); FAPRI Baseline Projections. University of Missouri, August 31, 2016 Projections for Marketing-Years 2017(F) to 2021(F).

at roughly 94% the value of corn. However, starting in the 2013/14 marketing year, a new demand source for grain sorghum allowed this market to pave its own path. Changes in China's domestic policy resulted in significantly higher prices for its domestic corn supplies and created an environment in which importing grain sorghum became an attractive alternative for feed grain users. Over the next two years, China's total grain sorghum imports skyrocketed and purchases from the United States increased by an average of 163% annually. This new found demand source helped push grain sorghum prices to 108% of the value of corn and created significant incentives for increased grain sorghum acreage and production despite production challenges and increased production costs in much of the Southern US created by the presence of the sugarcane aphid. Unfortunately, it appears that this expansion of acreage and production, along with growing supplies of corn and other feed grains, has outpaced demand growth. For the current 2016/17 marketing year, domestic stocks of grain sorghum are projected to be at the highest level seen in the past ten years. Lower corn and grain prices, a stronger US dollar, and a slowdown in the growth of China's grain sorghum purchases have impacted the demand. Additional farm policy changes in China have reduced the price of their domestic corn supplies and reduced the attractiveness of grain sorghum imports. China's purchases of US grain sorghum were down by nearly 7% for the 2015/16 marketing year. In addition, current USDA projections suggest that China's total grain sorghum purchases will be down by roughly 26% during the 2016/17 marketing year. Softer markets and continued issues with the sugarcane aphid have reduced the attractiveness of grain sorghum production. Lower acreage and production should help to stabilize prices moving forward. However, without a continuation of strong Chinese demand, it would appear that the grain sorghum market will once again follow the path set by the corn and other grain markets. It is unlikely that the grain sorghum market will experience any substantial improvement until the corn and other grain markets can work their way through their own high supply issues.

Soybeans

Explosive growth in world demand has been a driving force for the soybean market over the past several years. In response to growing demand, world soybean production has experienced significant increases, particularly with continued expansion in Brazil and Argentina. As long as the growth in demand matched the growth in supplies, prices were able to sustain at high levels. However, consecutive years of record or near record production in both the United States and South America helped push world supplies and stocks to record levels. A smaller-than-expected increase in US soybean acres in 2016 and smaller-than-expected crops in South America has provided some optimism for, at least, a short-termed improvement in the supply outlook. While domestic stocks of soybeans are still projected at significant increases to last year, world stocks are projected to fall for the first time in three years. Continued expansion in acreage and a return to more typical production levels in South America for their next production period could, however, make this improved supply and demand outlook short lived. Without a significant and unexpected increase in demand, it appears that the most significant potential for prices to move above USDA's baseline projections is for another significant supply shock.

Wheat

Wheat is truly a global crop and is impacted by global conditions that may increase exports more than expected.

The early rise in wheat price in 2007-2008 was due to wheat production problems in the Black Sea region that brought global wheat stocks to a 30-year low. Wheat prices were then pulled higher with corn and soybeans to the peak in 2012 where they reached $7.77/bu. Since then, world wheat production has experienced average annual production increases of over 9% per year. Domestically, wheat production has largely trended lower. Despite these more manageable domestic supply levels, the US wheat supply and demand balance sheet continues to erode. The biggest factor has been the inability to capture additional market share in the world wheat export market. Large world supplies have greatly impacted the United States' ability to move wheat into the world market. Some improvement is currently being seen in export demand as lower US prices have made US wheat more competitive in the world market. In addition, low wheat prices are expected to spur additional feed demand as wheat becomes a more competitive inclusion into livestock feed rations. While some improvement in overall wheat demand is expected, it will likely take additional adjustments to both the supply and demand side of the ledger to sustain significantly higher prices. Without a weather-related supply shock, these adjustments are likely going to take a few years to fully materialize.

Cotton

Other than a few isolated years in which cotton acres increased in reaction to higher prices, the overriding trend has been lower domestic cotton acreage and production over the last decade. Despite more manageable domestic supplies, lackluster demand has limited the market's ability to establish a sustained trend of higher prices. Domestic mill use has seen significant declines over the past 10 to 15 years placing much more reliance on exports to maintain demand strength. Cotton exports have gone from representing 40% to 50% of total cotton use in the early 2000's to more than 70% in the last three marketing years. China has been one of the most significant players in the world cotton market and was the chief factor in the expansion of US cotton exports. Unfortunately, over the past three years, average annual Chinese cotton import purchases have fallen by more than 60% due to slower economic growth and changes in domestic policies. With no real indication of a resurgence of China's cotton purchases given its large domestic stocks, the outlook for prices moving forward will largely depend on managing domestic acreage and production. Despite infrastructure and capital constraints to cotton acreage expansion, a lack of more attractive alternatives resulted in nearly a 1.5 million acre increase in US cotton acres in 2016. Increased supplies of cotton coupled with uncertain demand was expected to continue to support lower prices. However, weather concerns in major cotton growing areas in the United States and disruptions in production in competing countries have created some risk premium in the market and driven prices higher. This is likely a good example of what may be expected for this market moving forward. Periods of brief improvements in prices due to weather related concerns or production shortfalls but an underlying trend of lower prices without a significant improvement in demand.

Peanuts

Peanuts prices also eventually benefited from higher prices with the MYA price increasing from $0.173/lb. in 2005 to $0.332/lb. in 2012 (Table 1). Since then, the US MYA peanut price has fallen to prices that are just above the 2005 price level. The price in 2016 is projected to be $0.01/lb above the 2005 (Table 1). The projections for 2017-2020 for MYA peanut prices ranging from $0.18 to $0.185/lb.

Rice

Unlike many other commodities, the rice market did not experience the historic rise in prices over the last decade. For a large portion of the rice production region in the United States, the level of flexibility in switching acreage from crop to crop is extremely limited. As such, there has not been as significant a shift in acreage over the last decade as experienced with other commodities. Also, given the nature of rice production, the level of yield variability tends to be significantly lower than other crops resulting in year to year changes in total supplies that are less dramatic. As a result, price variability tends to be much more influenced by world supply and demand signals. The price strength experienced during the 2005 to 2013 time period was highly influenced by lower world supplies and stocks which helped make US rice more competitive in the world market. However, over the last three marketing years, world stocks have rebounded to much more adequate levels and created a more difficult environment for US rice exports. In 2016, an increase of over 500,000 in US rice acres has created additional pressure on prices. While domestic consumption of rice continues to show growth, the growth has not been sufficient to compensate for increases in production. Export demand continues to be key for potential for price improvement. Lower US prices have made US rice move price competitive in the world market but has yet to spark export sales at levels sufficient to push prices markedly higher. Without the ability to increase

the number of reliable and consistent export markets, it is difficult to project significant price improvement without a supply shock. Re-opening trade with Cuba and the rumors of potentially establishing trade with China would provide some of the additional demand needed by this market. If and when these export market develop as well as to what level of sales is still uncertain at this time. Until the market has more certainty about potential demand, prices look to remain in mostly an unchanged pattern with only minor improvements over the next few years.

Conclusions

The current overall tone of the agricultural commodity markets is undeniably softer than it has been over the last decade. While the agricultural sector will make adjustments to address supply and demand imbalances, the ability to sustain higher prices is likely dependent on stronger demand. Concerns over economic growth both domestically and worldwide provide only limited optimism that this stronger demand will materialize quickly. For the most part, it appears that markets will have to work through the current supply and demand imbalance signified by high stock levels. This is not to say that there is no potential for improvements in commodity prices. Certainly, supply shocks due to weather related production shortfalls can and do impact price movement. Many argue that the current downturn in prices would have occurred in the 2012/13 marketing year had it not been for drought in the Midwest curtailing supplies. Again, in 2016, forecasts for hot and dry conditions during critical growing periods in the Midwest sparked prices. Speculative interests helped translate these weather concerns into prices that many suggest were significantly higher than supply and demand fundamentals warranted. However, as weather concerns diminished, much of the risk premium introduced into the commodity markets was quickly removed.

The price movement experienced in 2016 can be looked as a case example of the market conditions that currently and will likely continue to exist for many commodities. Despite fundamental supply and demand conditions that suggested lower prices, just the potential for supply disruptions and the resulting activity from speculative interests were enough to spark both corn and soybean prices. The market's sensitivity to supply shocks or simply the potential for supply shocks has and will likely continue to maintain the high level of price volatility seen in commodity markets. The key lesson to take-away from this situation is price increases are likely to be momentary in those markets with long run fundamentals favoring lower prices. As such, producers will need to be prepared to take advantage of pricing opportunities when they materialize, no matter how short lived they may be. This will require producers and their agricultural lenders having a firm understanding of marketing alternatives available as well as the costs and risks associated with each.

Producers who are in the best position to take advantage of marketing opportunities are those who have a well thought out marketing plan and strategy. A critical step in establishing a marketing plan is having a full understanding of both variable and fixed production costs of the operation. Developing break-even price levels based on projected costs is critical in establishing a realistic and useful marketing plan. With the current low price environment facing most commodities, marketing is one component of the farm business that producers will want to closely examine to identify ways to manage risk, improve efficiencies, and minimize the short-run and long-run impacts for the operation's financial well-being.

Resources

FAPRI, University of Missouri, Baseline Projections, August 31, 2016.
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USDA-WAOB. September WASDE, September 12, 2016.
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