

# Surviving the Farm Economy Downturn



Southern Extension Committee



SOUTHERN  
EXTENSION  
RISK MANAGEMENT  
EDUCATION



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# Surviving the Farm Economy Downturn

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Cover photo: cotton harvesting in Texas.  
USDA photo by David Nance.



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# Foreword

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This collection of papers is the result of efforts by a group of Extension economist across the South. The genesis for these educational programs began where all good extension education programs begin: the needs of farmers and ranchers in the region.

Booms and busts in the agricultural economy are not new. The current period of low crop and livestock prices are following high prices. Yet this sustained period of disastrously low prices is following investment due to high prices. Many producers in the South are struggling to survive. Today's obvious comparison is to the farm crisis of the 1980s.

This set of papers starts with examining conditions in agriculture in the 1980s and today. The papers then address issues in crop and livestock agriculture, crisis management strategies, and making the hard decisions on exiting. Financial problems in times of crisis leads to incredible stress on farm families. The final paper examines the difficult issue of suicide, including recognizing signs of stress, and encourages people to not leave a caring word unsaid.

These educational materials are developed by Extension economists across the South working together in the Southern Extension Committee. This collection of Extension economists have worked together for several decades to develop educational materials to benefit farmers and ranchers in the South.





# Are We Headed Toward Another Farm Financial Crisis as Severe as the 1980s?

Joe L. Outlaw and James W. Richardson

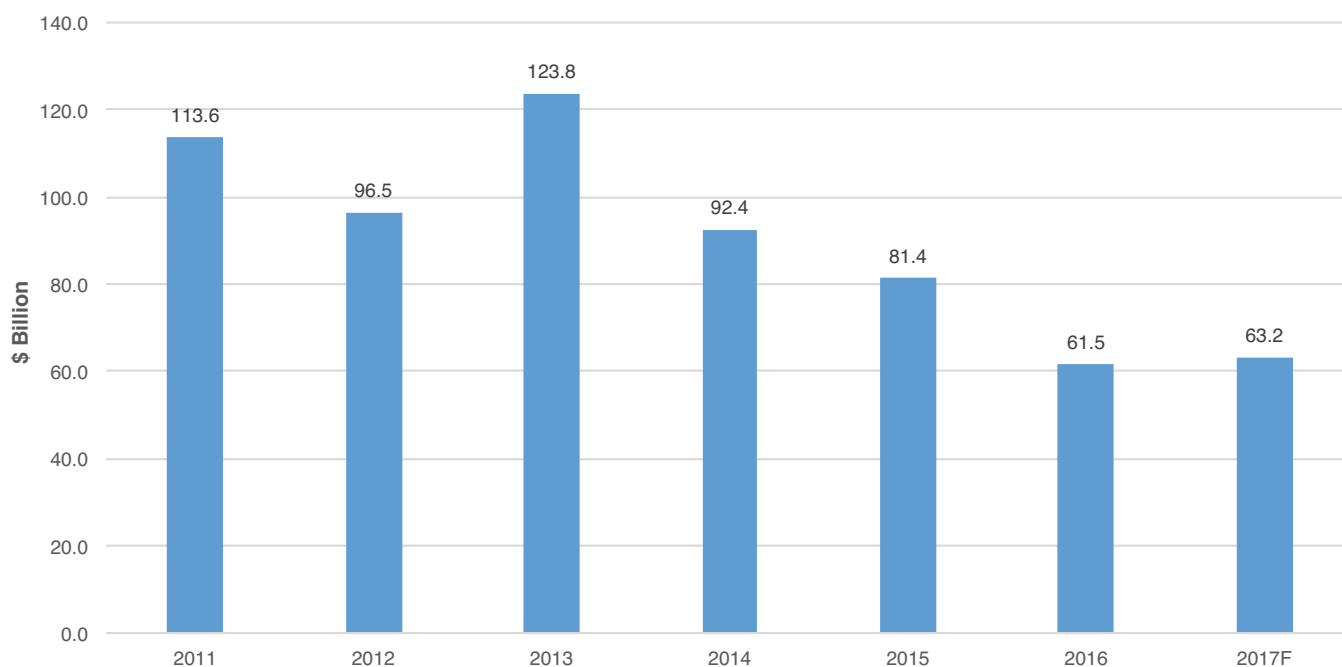
## Introduction

Agricultural producers in the U.S. are currently struggling financially. Farms and ranches are losing money and some are going out of business. Those who are not going out of business are having to cut expenses, restructure debt, and look for additional sources of income to survive (Shaffer and Ray). In 2013, U.S. net farm income reached an all-time high of \$123.8 billion due to record prices for most agricultural commodities (Figure 1). Since that time, many commodity prices have fallen by more than one-half of their previous levels. As a result, U.S. net farm income fell each year until 2016 bottoming out at \$61.5 billion and resulting in a more than 50 percent decline in only three years. The decline has led to farmers and ranchers, politicians and industry observers asking

whether we are headed toward another 1980's magnitude farm financial crisis.

The U.S. farm financial crisis experienced in the 1980s is second only to the Great Depression in terms of widespread devastating farm financial losses that affected all types of farms across the nation. In the 1980s, the sustained decline in farm incomes and corresponding drop in land values triggered a large number of loan defaults leading to a significant number of farm bankruptcies. Many states had to set-up suicide prevention hotlines as farmers who saw no feasible way out of their financial problems took their own lives and in some cases the lives of their entire families and their pets (Farkas).

The problems of the 1980s were preceded by such good conditions in the late 1970s that some refer to this period as “the golden age of agriculture.” There are a



**Figure 1. U.S. Net Farm Income, 2011 – 2017.**

Source: U.S. Department of Agriculture. Farm Income and Wealth Statistics.

We wish to acknowledge the contribution of Dylan Outlaw for his initial research and the development of the graphics for this article.

number of similarities between the current downturn in farm financial health and the conditions in the 1980s but there are also some important differences. This paper evaluates whether the conditions are similar enough to conclude that we might be headed toward a 1980's type of financial crisis.

## Literature Review

The literature review focuses on the circumstances in the 1970s that led to the 1980's farm financial crisis. A review of these circumstances is necessary to determine whether the current conditions in agriculture are similar enough to lead to a similar crisis for farmers.

During the 1970s, lower trade barriers, bad weather around the world, and large grain purchases by the Soviet Union led to record (at the time) prices and farm incomes (Manning). These conditions led Secretary of Agriculture Earl Butz to proclaim that farmers should “plant fence row to fence row” and “get big or get out.” The implication was that the good times would last indefinitely. Farmers responded to these conditions just as the Secretary asked, they got bigger by borrowing money and taking on debt. Land prices soared as farmers were bidding more and more for land they needed to expand and take advantage of the high commodity prices.

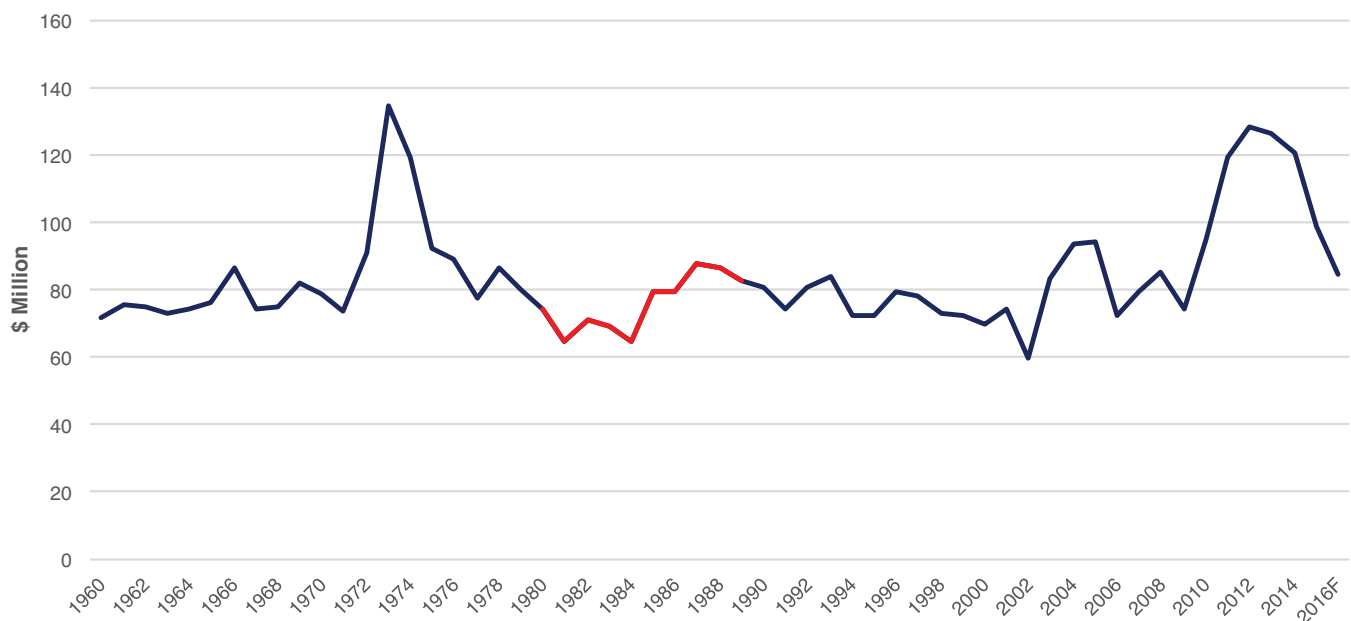
The economic conditions during the 1970's featured negative real interest rates which means that after

adjusting for inflation, it did not cost farmers to borrow money to purchase land and add to their operation. Under these conditions farmers took on a lot of debt that was backed by their land. Conditions were so good that the U.S. Farm Credit System changed their lending requirements to allow agricultural lenders to lend farmers up to 85 percent of the value of a producer's assets which previously had been set at 50 percent (Bovard). The change in loan requirements enabled farmers to buy more land and use up to 85 percent of their owned assets (which was mostly land) as collateral.

So, in a nutshell, if commodity prices ever fell, then land prices would fall, the value of the land farmers had pledged as collateral would fall, and since commodity prices fell the loans would not be repaid to banks. The banks would foreclose on the farm and would receive less value in land than they had loaned to farmers causing the banks to fail. That and more is what happened in the 1980s (Stam and Dixon).

By the 1980s, the “fence row to fence row” production caused commodity prices to decrease substantially causing land prices to fall. Many farms and banks failed. Some farmers and lenders committed suicide. The 1980s will be remembered as a terrible time for agriculture (Bovard).

The current conditions in agriculture have some worried that we are headed for another farm crisis. In a summary of recent ag reports from the Chicago, Dallas,



**Figure 2. U.S. Net Cash Farm Income, 1960 – 2016.**

Source: U.S. Department of Agriculture. Farm Income and Wealth Statistics.



Kansas City, and Minneapolis Federal Reserve Districts, Shaffer and Ray reported that the banks were seeing increased loan demand and decreases in loans being repaid across all banks. The DTN/Progressive Farmer Ag Confidence Index reports on a quarterly survey conducted by DTN/Progressive Farmer that measures producer confidence. During 2016, the index decreased 27 points indicating producers were very pessimistic about their future (DTN/Progressive Farmer). A 27-point decline, while bad, could be considered mild if the current downturn turns into a farm financial crisis.

## Materials and Methods

To determine whether current conditions are trending toward those in the 1980s each of the factors identified as important in the literature review will be compared for the current decade versus the 1980s. This analysis will use published data for each of six economic categories from the USDA-Economic Research Service (ERS). The six categories to be analyzed are:

- Farm Income – as farm income declines, producers are worse off,
- Rates of Inflation Rates – as general inflation increase, inputs become more expensive,
- Interest Rates – as interest rates increase, the cost of borrowing money increases,

- Exchange Rates – as exchange rates increase, it costs more for foreign customers to purchase our products and results in decreased demand for U.S. products,
- Land Values – as land values increase, the borrowing capacity increases, and
- Debt-To-Asset Ratio – as debt-to-asset ratios increase, farmers own less of their assets indicating financial weakness.

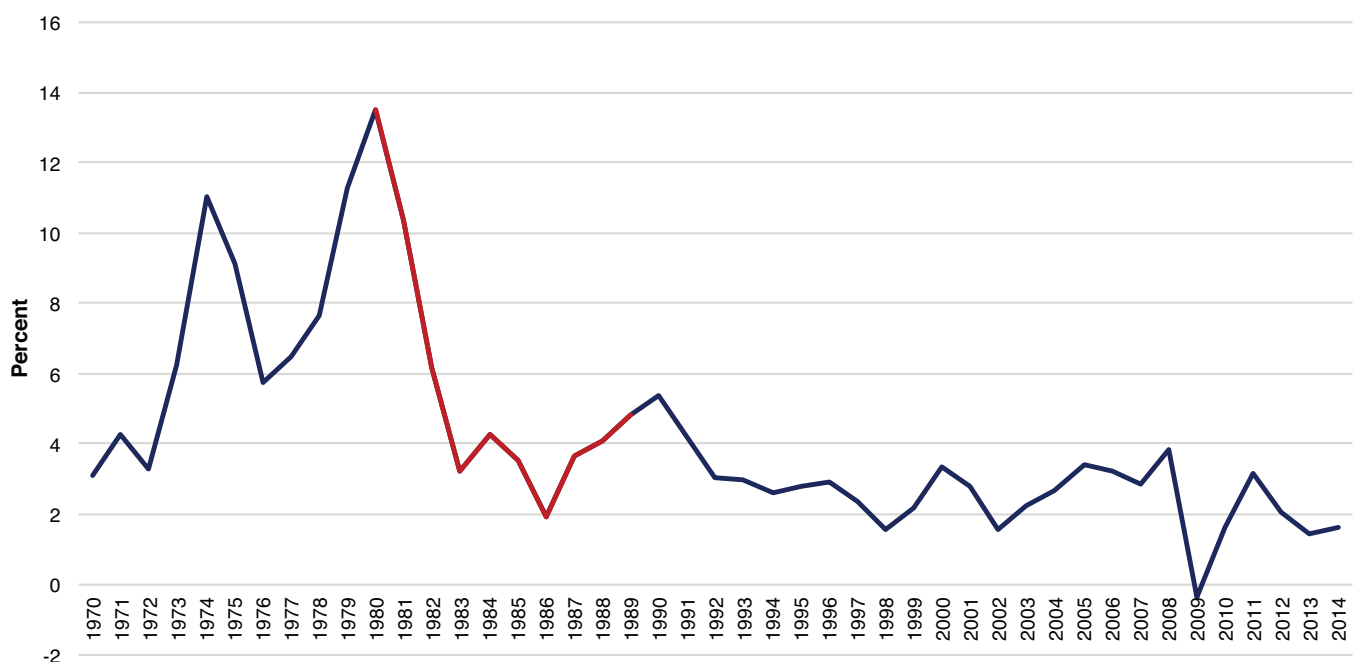
## Results

### Farm Income

During the 1980s, U.S. net cash farm income averaged around \$80 billion/year (Figure 2). Net cash farm income is simply total cash receipts for all U.S. farms minus total expenses except depreciation. Even though farm incomes have declined significantly during the current decade, net cash farm income has averaged \$100 billion/year. To this point, farm incomes are nowhere near levels during the 1980s.

### Rates of Inflation

The rapid increase in rates of inflation during the 1970s ended by the end of the decade. Inflation decreased from an all-time high of 14 percent annually in 1980 to an average of 4 percent by the end of the 1980s (Figure 3).



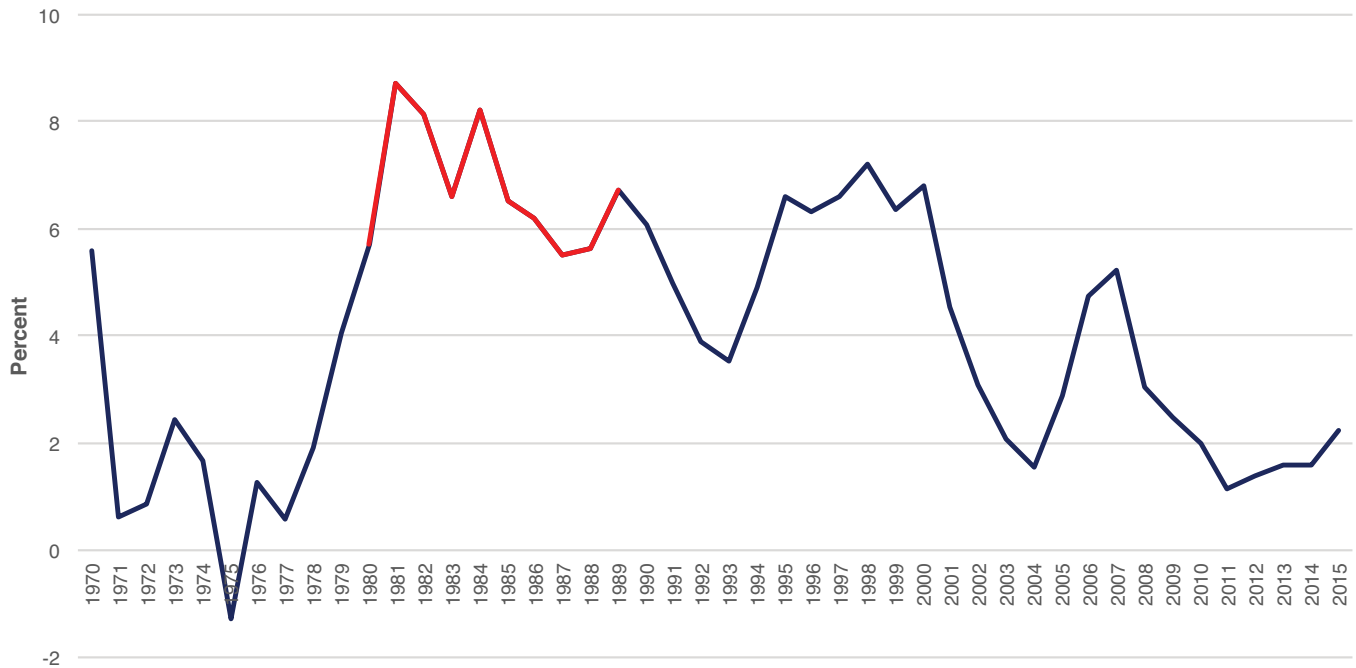
**Figure 3. Annual Change in Consumer Price Index 1970 – 2014.**

Source: U.S. Department of Agriculture. Farm Income and Wealth Statistics.

During the most recent decade inflation has averaged 2 percent annually. The consumer price index is a commonly used measure of inflation that calculates the changes in prices of a market basket of consumer goods over time. Annual input cost inflation is lower currently than during the decade of the 1980s.

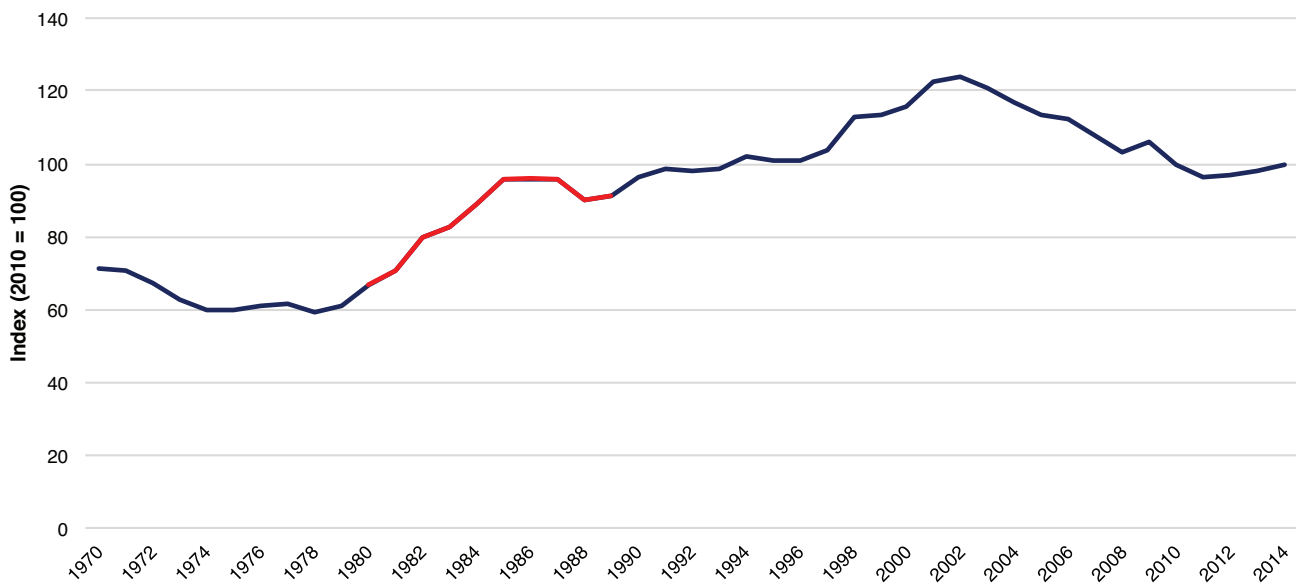
### Interest Rates

Inflation adjusted or real interest rates increased each year after 1975 ending the decade at around 6 percent (Figure 4). During the early 1980s, real interest rates increased to nearly 9 percent in 1982 before



**Figure 4. Real Interest Rates in U.S., 1970 – 2015.**

Source: U.S. Department of Agriculture. Farm Income and Wealth Statistics.



**Figure 5. U.S. Agricultural Trade Weighted Exchange Rate, 1970 – 2014.**

Source: U.S. Department of Agriculture. Farm Income and Wealth Statistics.

declining throughout the 1980s to 1988. Interest rates increased to 7 percent in 1989 before taking a generally downward path through the current decade. While recently trending higher, current real Interest rates are considerably lower than during the 1980s.

### Exchange Rates

The trade weighted exchange rate is a general measure of the strength of the U.S. dollar relative to a basket of other currencies. The data in Figure 5 is an index that was developed where the data for each year was divided by the number for 2010. It can be interpreted as the index goes higher, the value of the U.S. dollar is higher relative to the basket of other currencies. This means our products are relatively more expensive for our trading partners to buy. Relative to the decade of the 1980s, the value of the U.S. dollar is slightly stronger. This can be interpreted as a negative result because moving U.S. products to foreign customers will be more expensive and therefore harder.

The value of farm land decreased throughout the decade of the 1980s which significantly lowered collateral values (Figure 6). The current value of land in the U.S. has risen almost annually since the 1980s. The results for land values would indicate that the problems associated with declining collateral values during the 1980s have not reoccurred.

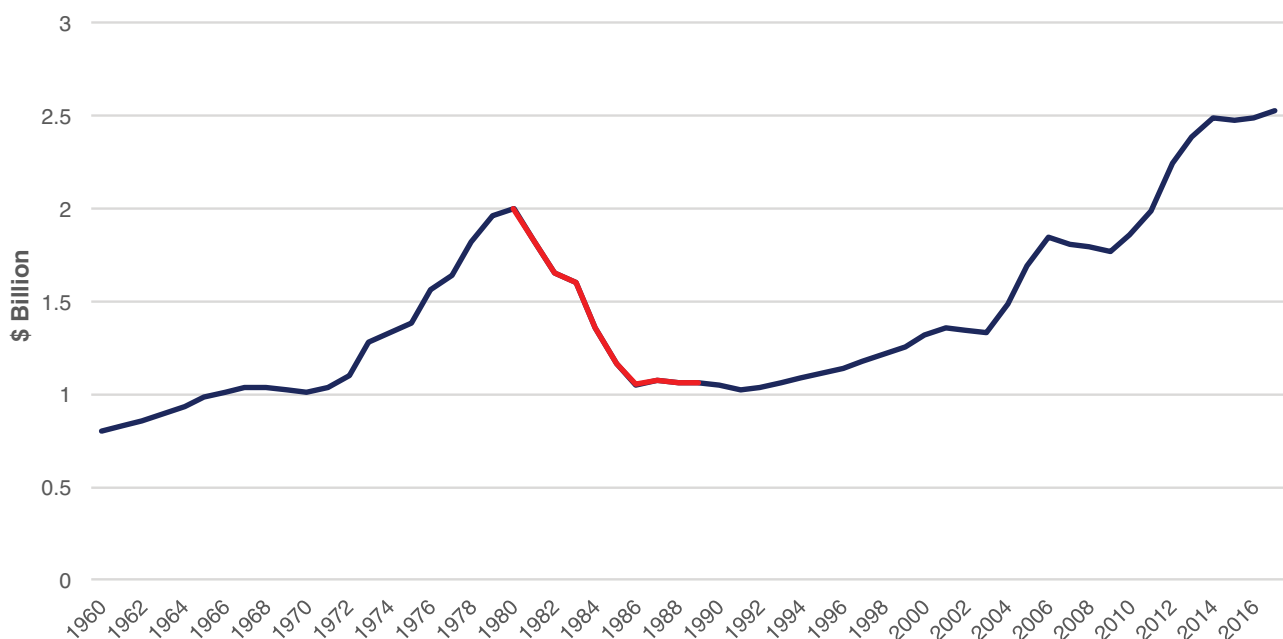
### Debt-To-Asset Ratio

The debt-to-asset ratio for U.S. agriculture is the sum of all debt on farms divided by the value of all farm assets. As the debt-to-asset ratio increases it is generally considered that farmers are in a worse financial position because debt makes up a larger proportion of their assets. The U.S. farm debt-to-asset ratio increased each year through 1985 before declining each year through the end of the period (Figure 7). In general, the U.S. farm debt-to-asset ratio has been at historic lows throughout the current decade. However, it should be acknowledged that the trend during the current decade is up.

### Discussion and Conclusions

U.S. agricultural producers are currently struggling financially due to a significant drop in most commodity prices. Since peaking in 2013, U.S. net farm income has declined each year until 2016 bottoming out at \$61.5 billion. The decline has led to farmers and ranchers, politicians and industry observers asking whether we are headed toward another 1980's magnitude farm financial crisis.

Of the six measures that were analyzed, only Exchange Rates indicate a worse situation relative to the 1980s. The other five measures Farm Income,



**Figure 6. Value of U.S. Farmland Adjusted for Inflation in Billions, 1960 – 2016.**

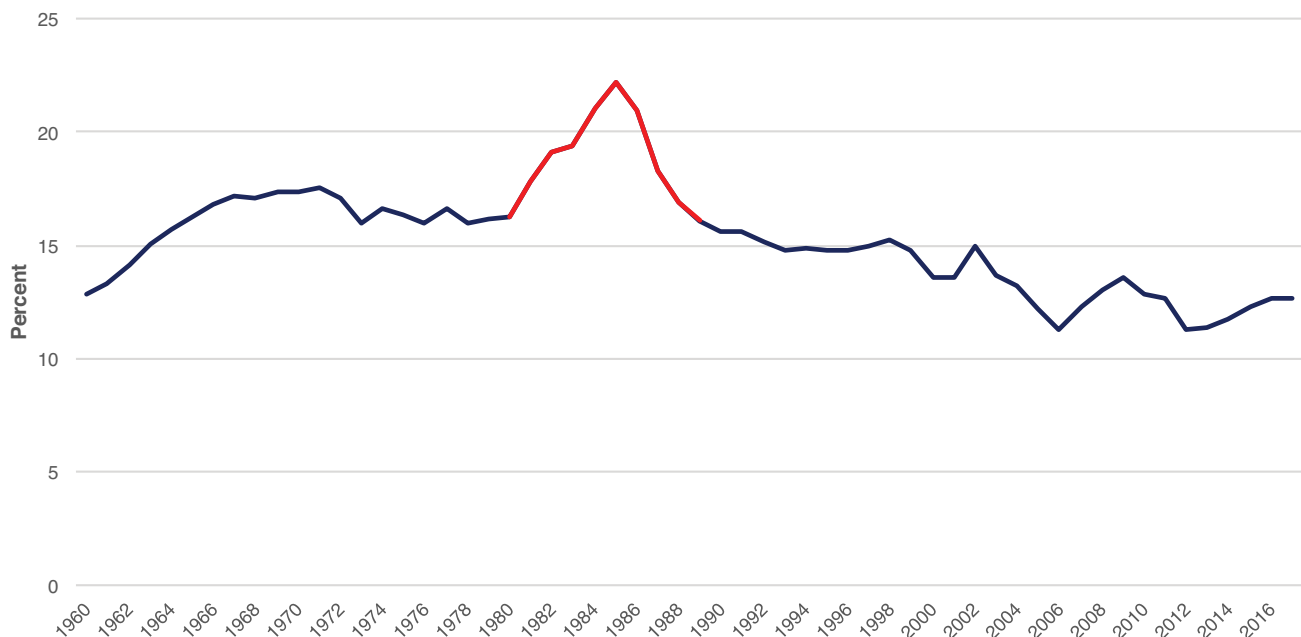
Source: U.S. Department of Agriculture. Farm Income and Wealth Statistics.

Rates of Inflation, Interest Rates, Exchange Rates, Land Values, and Debt-To-Asset Ratio are all currently improved relative to the 1980s. However, Farm Income, Inflation Rates, and Debt-To-Asset Ratio are all worsening.

These results lead to the conclusion that while there is significant financial pressure on U.S. farming operations, conditions are currently not as bad as the farm financial crisis experienced during the 1980s. Future research should continue to monitor the important criteria as conditions could continue to deteriorate.

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**Figure 7. U.S. Farm Debt-To-Asset Ratio in Percent, 1960 – 2016.**

Source: U.S. Department of Agriculture. Farm Income and Wealth Statistics.

# Grain, Oilseed and Fiber Crop Outlook

Kurt M. Guidry, Todd D. Davis, and Brian R. Williams

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 stepwise 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

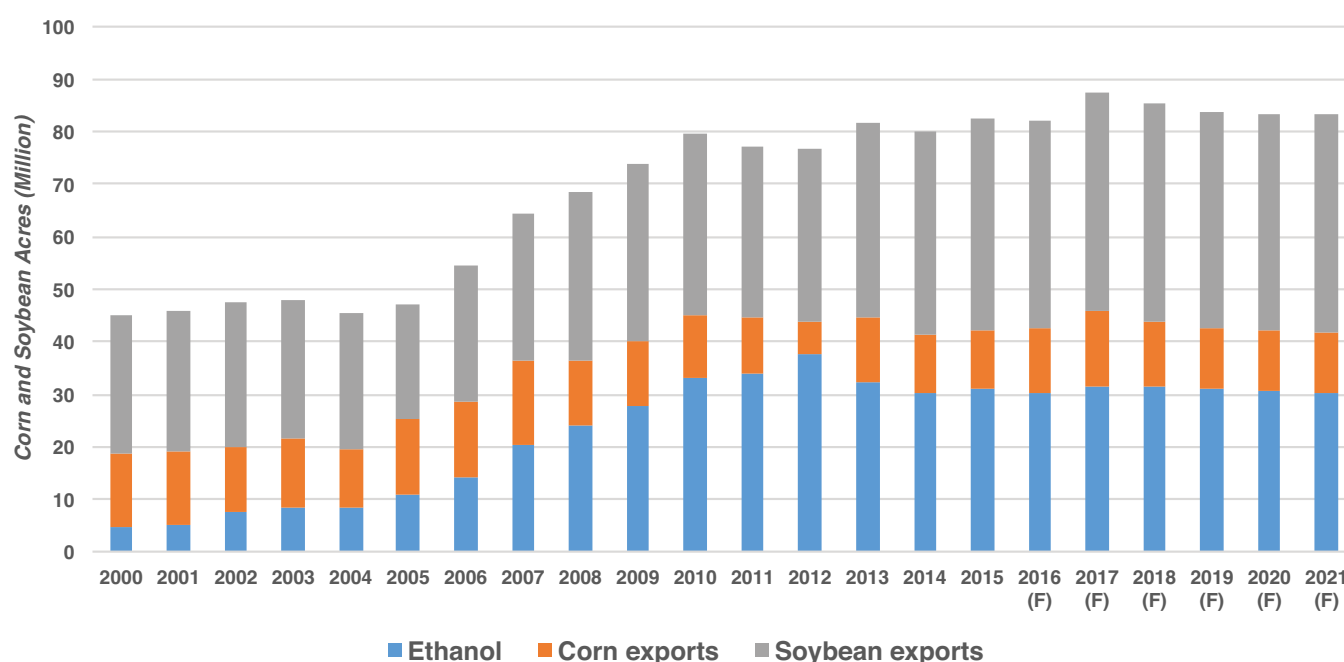


Figure 1. Corn and Soybean Acres Needed to meet Export and Biofuel Use (2000 – 2021F) (Million Acres).

Source: USDA-World Agricultural Outlook Board. FAPRI.

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

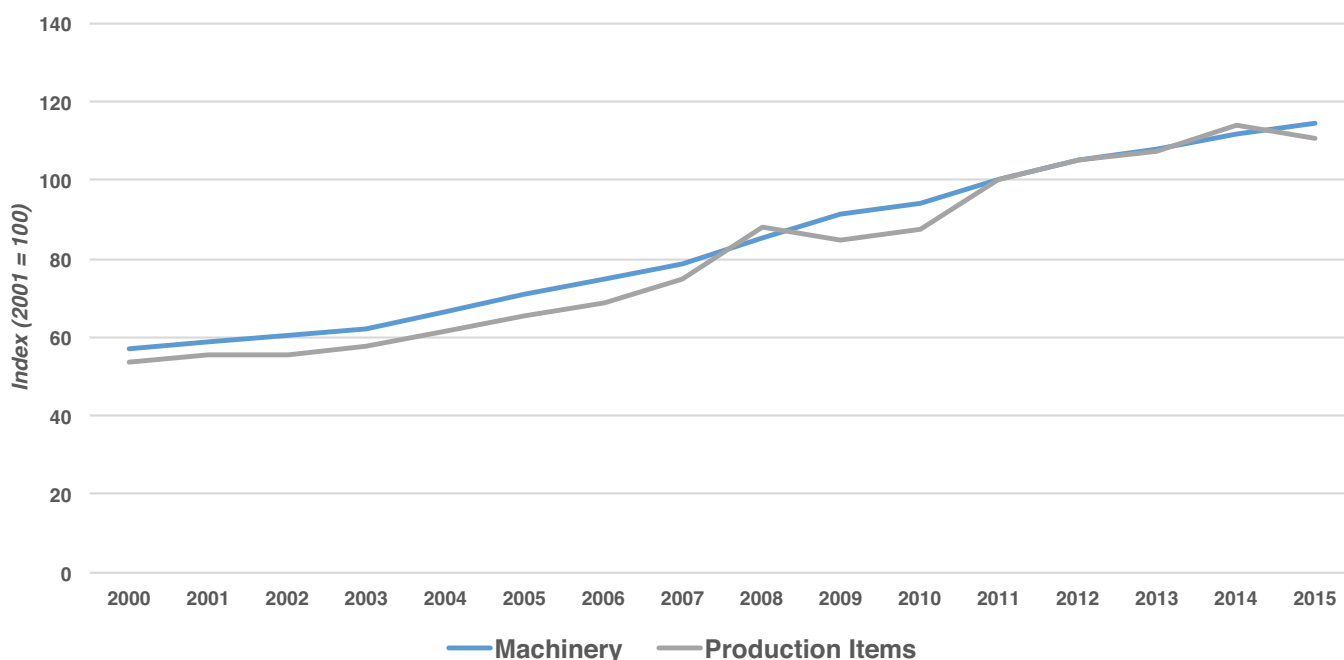
This new demand source for corn created both a significant shift in crop acres as well as an introduction of new production acres from conservation and idle acres as producers looked to expand corn production. At the same time, drastically stronger world soybean demand, driven primarily by China, created 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.

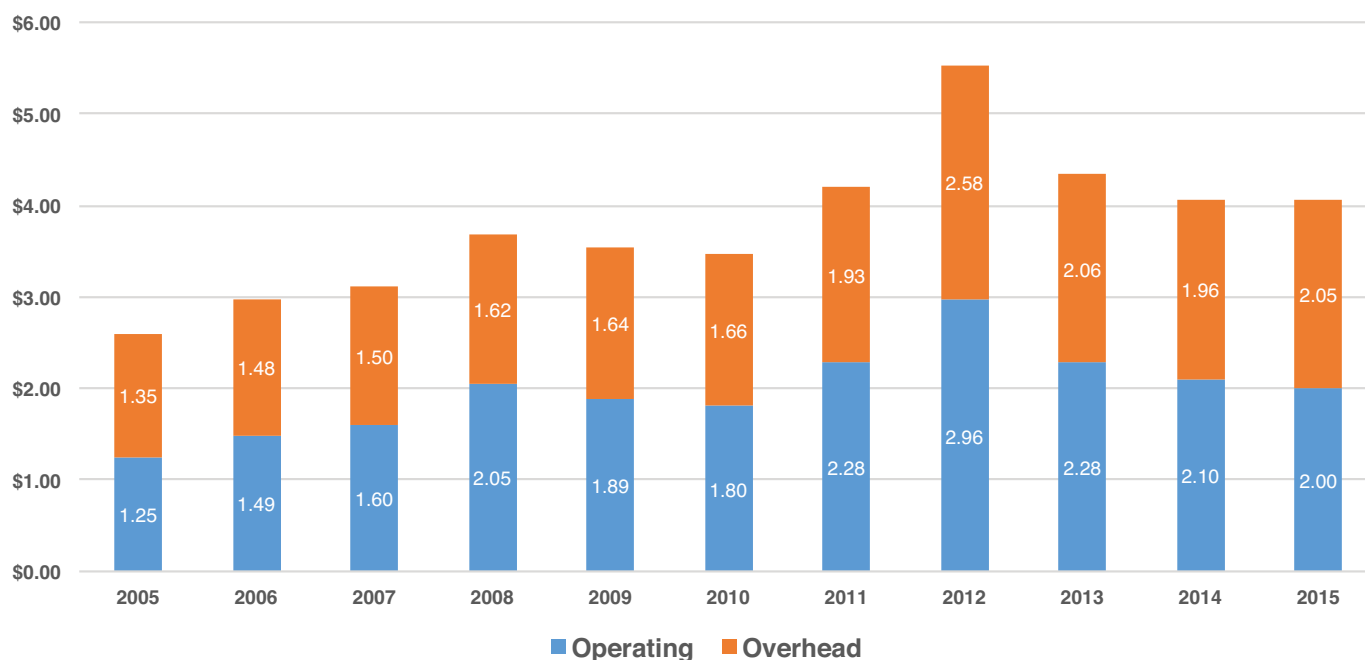
As long as commodity prices remained at elevated levels, the concerns regarding the increased cost and debt structures facing farming operations were somewhat limited. However, as commodity prices have fallen back to levels closer to their long-run averages, the cost structure facing many agricultural 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 markets 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.

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USDA-WAOB. September WASDE, September 12, 2016.  
USDA-WAOB. WASDE Projections from 2005 to 2016.



# Impacts of the Increased Dependence on Trade on the Farm Economy

Luis A. Ribera, David P. Anderson, and Kenny H. Burdine

As agricultural producers experience higher input costs and lower revenues, along with declining US government support to agriculture, understanding the impacts of international trade and how markets and competition are affected will take on added importance for farmers, agribusinesses, policy makers, and agricultural leaders. International markets are important for many US farm products. Trade liberalization has provided additional markets for some US products, which in turn lead to higher prices and greater return to producers. Trade is also a major source of import competition for some producers, leading to declining market prices and lower returns. Greater reliance on trade has led increased sources of market instability. Overall, US agriculture has much to gain from freer trade, but these benefits come with added risks because trade is influenced by many factors. Changes in trade policies and economic growth rates among countries, exchange rate fluctuations, and the emergence of new competition all influence trade and make the international market risky for US producers.

The United States is the largest exporter of farm products and those exports account for about 35% of farm income, up from 28% in 1996; hence the

importance of agricultural trade for US farm income. In addition, agricultural exports help support rural communities across the United States, with each dollar of exports stimulating another \$1.27 in business activity.

The importance of export markets to US agriculture is illustrated in Table 1. In 2015, over 70% of US cotton was exported, followed by more than one-half of all US sorghum and rice production. Soybeans and wheat exports accounted for 49.4% and 37.8%, respectively. Pork, poultry and corn producers also depend on exports for a significant portion of their markets, while beef exports account for about 9.5% of production.

Agricultural imports are also important, as US consumers are more dependent on them for certain commodities, as well as, for year round supply. Not surprisingly, these include tropical products not produced, or only sparingly produced, in the United States such as limes, coffee and bananas. Orange juice and tomato imports have increased over the years as production, mainly in Florida, has decreased significantly. Other products such as beef and pork account for a smaller share of US imports.

After reaching a record in 2014, the value of agricultural exports dropped in 2015 and have continued

**Table 1. US Agricultural Exports as a Share of Production for Selected Commodities, 2015.**

Commodity	Percentage of Production Exported
Cotton	71.0
Sorghum	57.0
Rice	56.0
Soybeans	49.4
Wheat	37.8
Pork	20.2
Poultry	16.0
Corn	14.1
Beef	9.5

Source: USDA/Foreign Agricultural Service, "Production, Supply and Distribution (PSD)" online database (<https://apps.fas.usda.gov/psdonline/>).

**Table 2. US Agricultural Imports as a Share of Domestic Consumption for Selected Commodities, 2015.**

Commodity	Percentage of Domestic Consumption
Coffee	100.0
Limes	100.0
Banana	99.8
Tomatoes	51.0
Orange Juice	44.8
Beef	13.6
Pork	5.4

Source: USDA/Foreign Agricultural Service, "Production, Supply and Distribution (PSD)" online database (<https://apps.fas.usda.gov/psdonline/>).

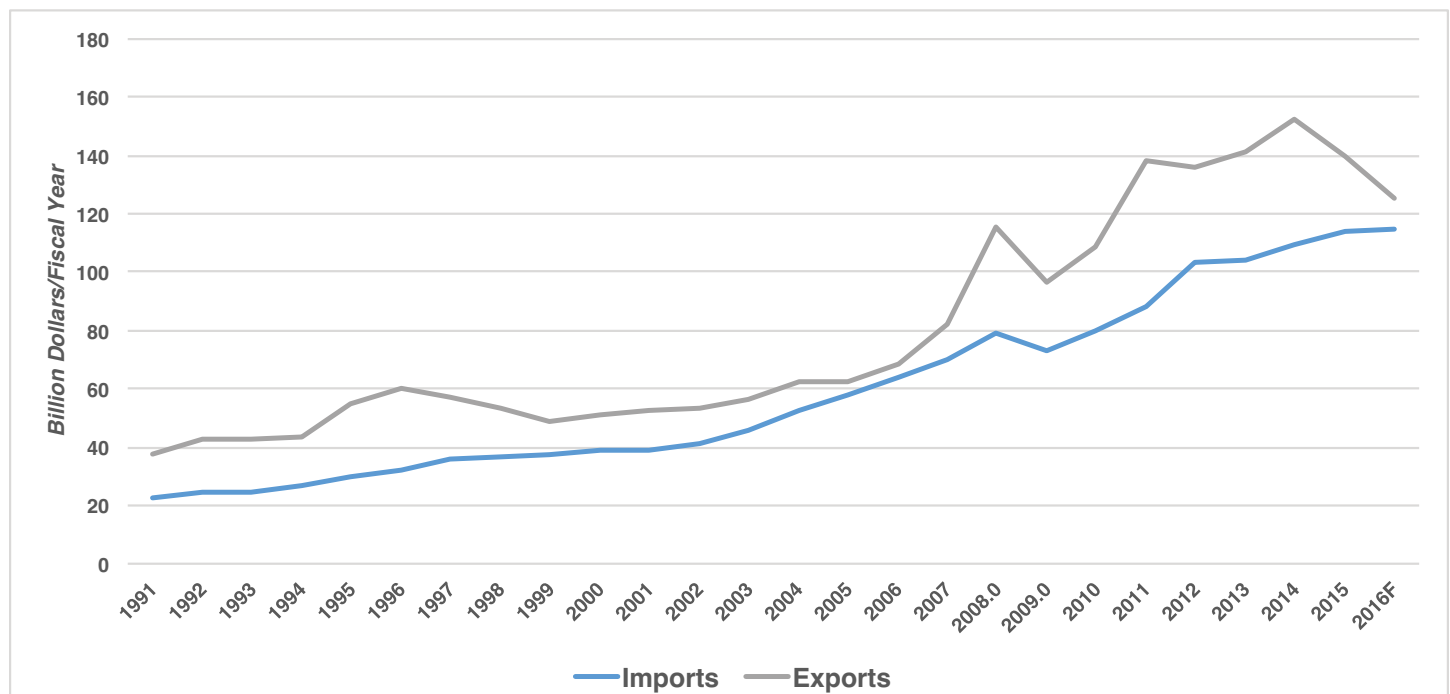
its downward trend in 2016 (Figure 1). On the other hand the value of agricultural imports are expected to reach an all-time high (ERS, 2016). USDA forecasts exports to be lower than 2015 (\$139.7 billion), reaching \$125.5 billion in 2016 and down from a peak of \$152.3 billion in 2014. Agricultural imports will be up from \$114 billion in 2015's record to a new record high of \$114.8 billion in 2016.

### What is Causing the Reduction in Agricultural Export Values?

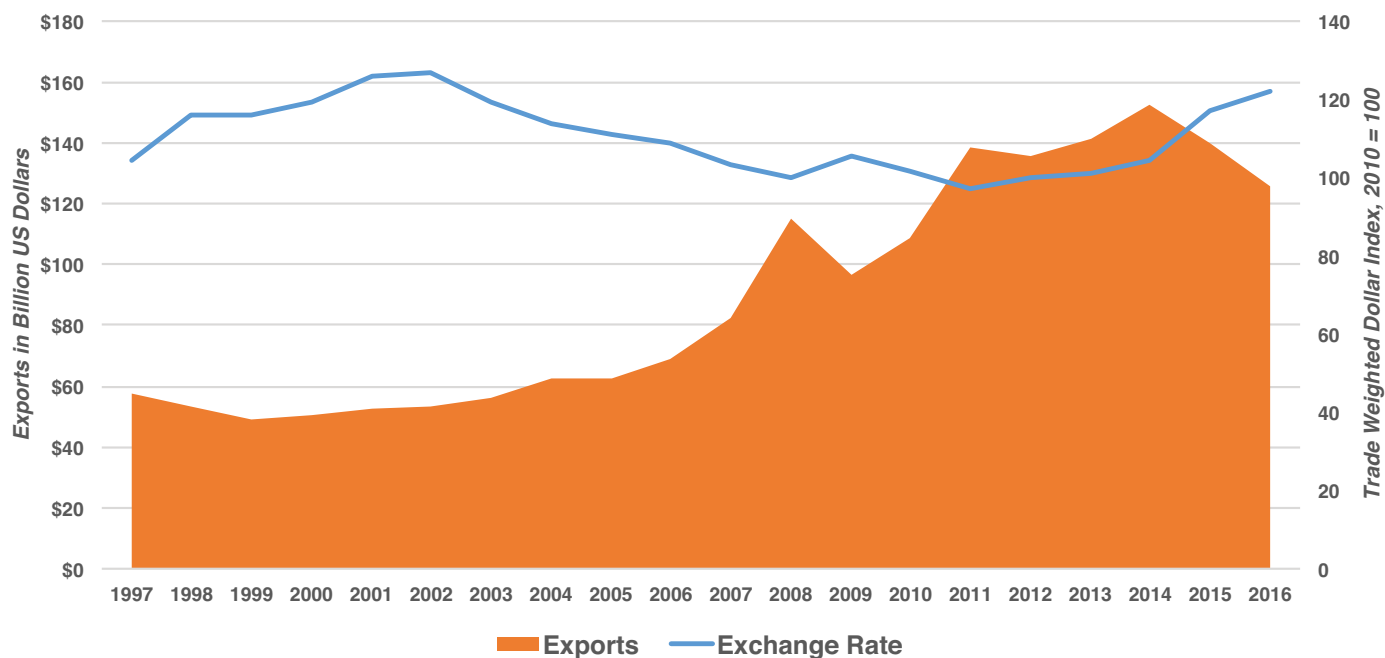
The decline in the value of agricultural exports over the last couple of years is related to lower than expected commodity prices and also, for the most part, reduced export volumes as global demand slowed

down. Although, in the case of beef, record high prices amid tight supplies, have curtailed exports. World per capita GDP grew 1.4% in 2015 and is expected to be about the same in 2016. Per capita income growth in the key emerging markets of Brazil, Russia, India, Indonesia, and China was 3.2% in 2015, and is expected to increase to 3.4% in 2016. This is normally a robust growth, but it is roughly half of the 6.3% average annual rate of income growth these countries achieved over the previous decade. Moreover, Brazil has been in a recession with a shrinking GDP and income.

The United States economy is expecting slow, but steady growth. After a weak first quarter of US GDP growth in 2016, the economy is expected to strengthen in the second half of the year as continued improvements in labor markets and rising wages support consumer

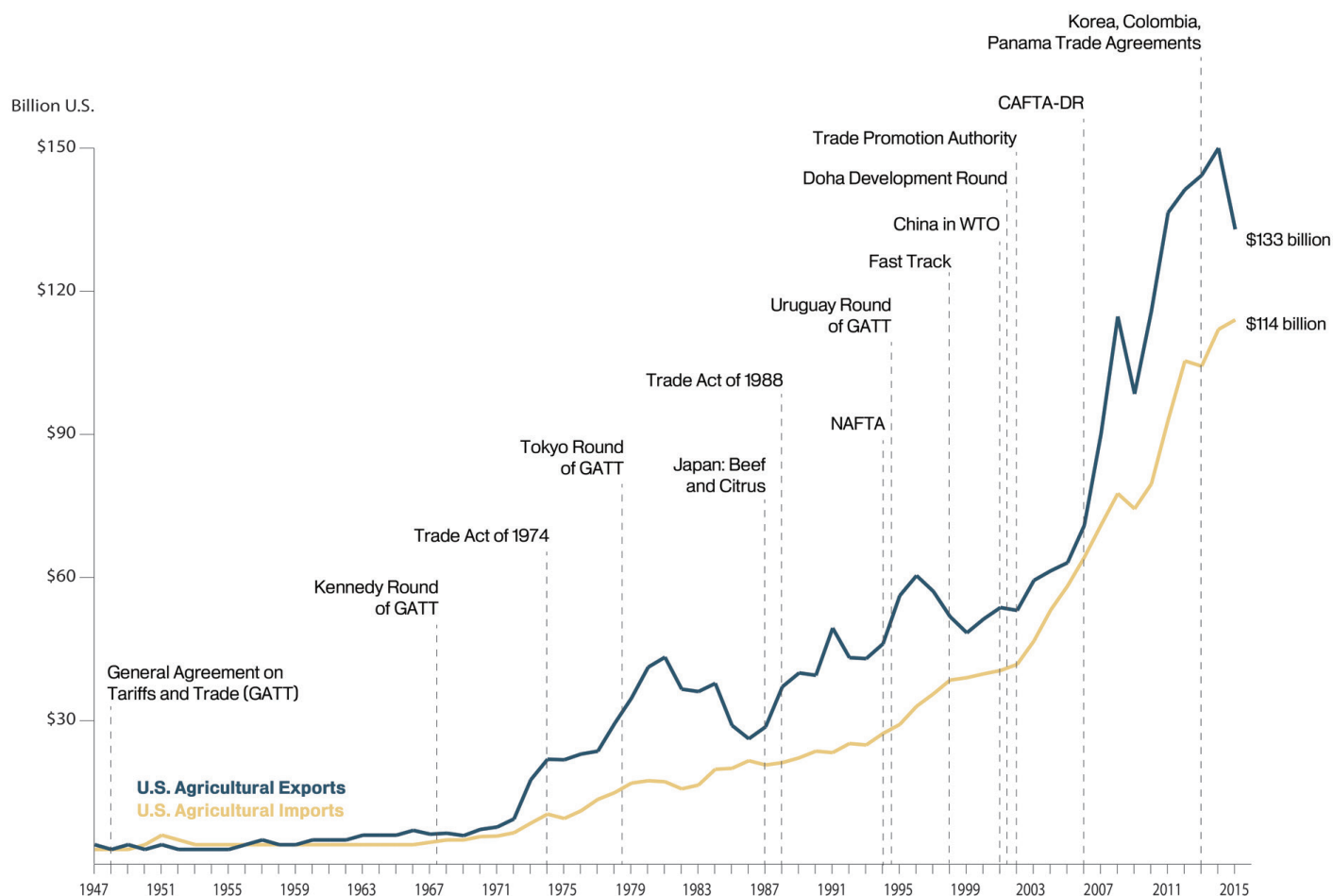
**Figure 1. US Agricultural Trade, 1991-2016F.**

Source: USDA/Foreign Agricultural Service, "Global Agricultural Trade System (GATS)" online database (<https://apps.fas.usda.gov/gats/>).



**Figure 2. Exchange Value of the US Dollar and US Agricultural Exports.**

Source: USDA, Economic Research Service.



**Figure 3. US Trade Agreements, 1947-2015.**

Source: USDA, Foreign Agricultural Service (<https://www.fas.usda.gov/sites/default/files/2016-06/trade-agreements-create-opportunities.jpg>).



spending. Nevertheless, per capita GDP growth is expected to be 1.3% in 2016, falling short of the 1.7% growth in 2015. One key factor that can affect the US economic growth is the oil price. Low oil prices have mixed outcomes in the US economy, providing a boost to consumers and businesses, but reducing employment, especially in oil and gas producing states creating sluggish local economies.

An important reason for fluctuations in exports is changes in the value of the dollar relative to foreign currencies. Steady US economic growth and economic challenges abroad have led to the appreciation, or strengthening, of the dollar. A strong dollar causes US products to become more expensive for importing countries, therefore, decreasing sales to those countries. Figure 2, contains the value of agricultural exports and the value of the dollar relative to foreign currencies. In the early 1980s, late 1990s and early 2000s, the dollar was strong making US agricultural products more expensive in importing countries, therefore decreasing sales. After reaching a peak in 2002, the dollar started to weaken until 2013 and overall export sales increased. Recently, China and other emerging countries such as Brazil and Argentina devalued their currencies making it harder for US exports to be competitive.

Changes in exchange rate and economic growth are not the only reasons for these export fluctuations. For some commodities there was also increased competition from other countries. For example, over the years Brazil increased their production of soybeans, cotton and more recently corn, products that compete directly with US

exports. Other examples are wheat exports from Canada, rice from Vietnam and poultry from Brazil. The increase in production from other countries increases the supply of those products, increasing competition and reducing prices. On the other hand, opening new markets causes fluctuations in exports, increasing demand for US products, which usually leads to increasing prices. For example, reestablishing trade relations with Cuba could open a new market for US products such as rice, wheat, and cotton.

Trade agreements impact exports and imports (Figure 3). Trade Promotion Authority (often termed fast track) was passed by Congress in 2015 and the Obama Administration has moved forward with regional trade agreements. While negotiations were completed for the Trans-Pacific Partnership (TPP), the Trump Administration formally removed the United States from the agreement. Transatlantic Trade and Investment Partnership (TTIP) negotiations are likely dead. Brexit has also added some additional instability in the European zone.

Trade is an important part of agricultural markets. As US agriculture has become more dependent on trade, world events carry more risk for prices. Growing export markets will continue to be important goal for US agriculture in coming years.

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# Southern Agricultural Lending and Farm Credit Conditions

Bryon J. Parman and Max W. Runge

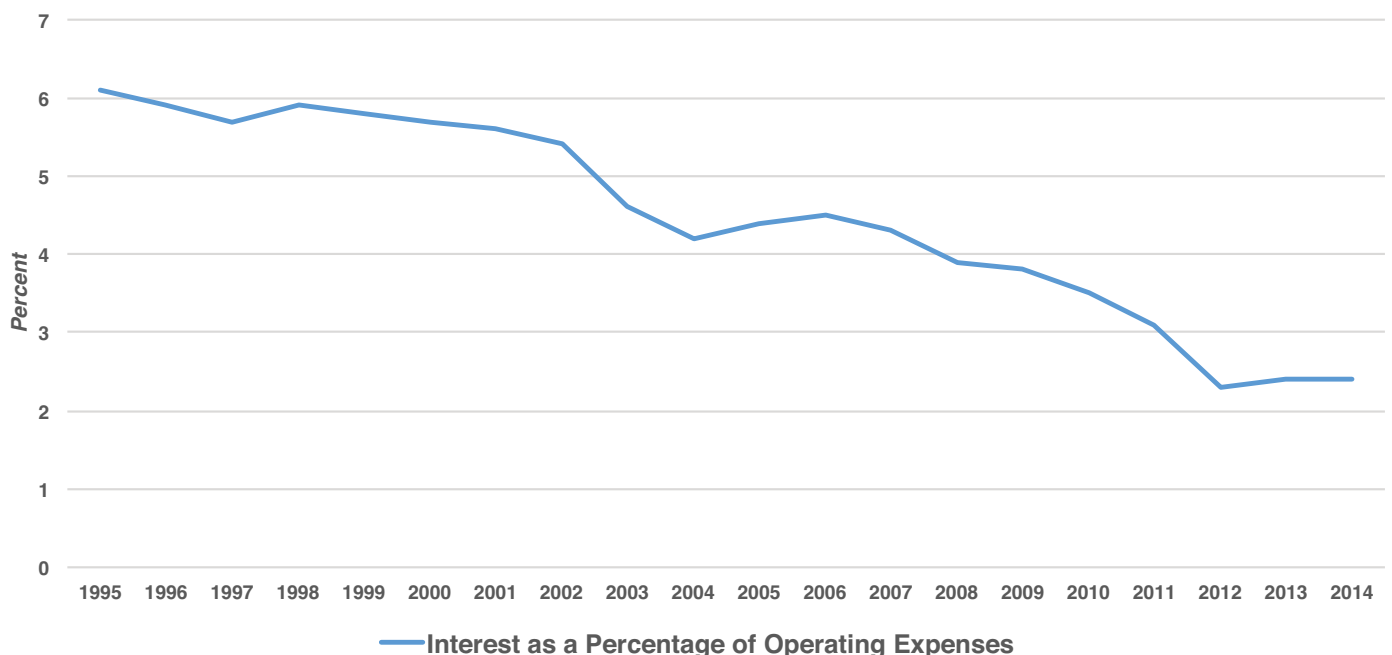
## Loan Demand and Repayment

With the majority of US farmers and ranchers needing loans for operation or expansion, borrowing costs and fund availability are an important component of US production agriculture. In the decade from 2005 to 2015, high farm incomes and rapidly appreciating agricultural asset values, primarily land, encouraged liberal lending practices by agricultural credit providers. With farmers enjoying relatively higher net incomes, producers required relatively less funds opting to self-finance in some cases. Moreover, interest rates began to decline reaching historic lows after 2010. As a result, interest as a percentage of operating expenses for farms nationwide declined drastically through 2012 (Figure 1).

Following the downturn in commodity prices that began in 2014, demand for agricultural loans has risen. Figure 2 from the Federal Reserve Bank of Kansas City illustrates the dramatic increase of farm operating

loans beginning toward the end of 2013 and continuing through 2016. Specifically within the Southern region which includes Texas, Oklahoma, Louisiana, Arkansas, Kentucky, Tennessee, Mississippi, Alabama, Georgia, The Carolina's and Florida, demand for loans has been higher in subsequent years peaking at 40% higher in the first quarter of 2015, and 30% higher at the beginning of 2016 (Federal Reserve Bank of St. Louis).

While demand for loaned funds has increased due to tighter profit margins for southern producers, loanable fund availability has declined as well as the rate of loan repayment. The St. Louis Federal Reserve *Ag Finance Monitor* reports that relative to 2013, loanable fund availability was nearly 20% lower in the 2nd quarter of 2014, 40% lower in the 2nd quarter of 2015, and projected to have be 30% lower in 2016. The same report shows that the loan repayment rate across much of the south has declined nearly 50% from the 2nd quarter of 2013 through the 1st and 2nd quarters of 2016 (Figure 3).



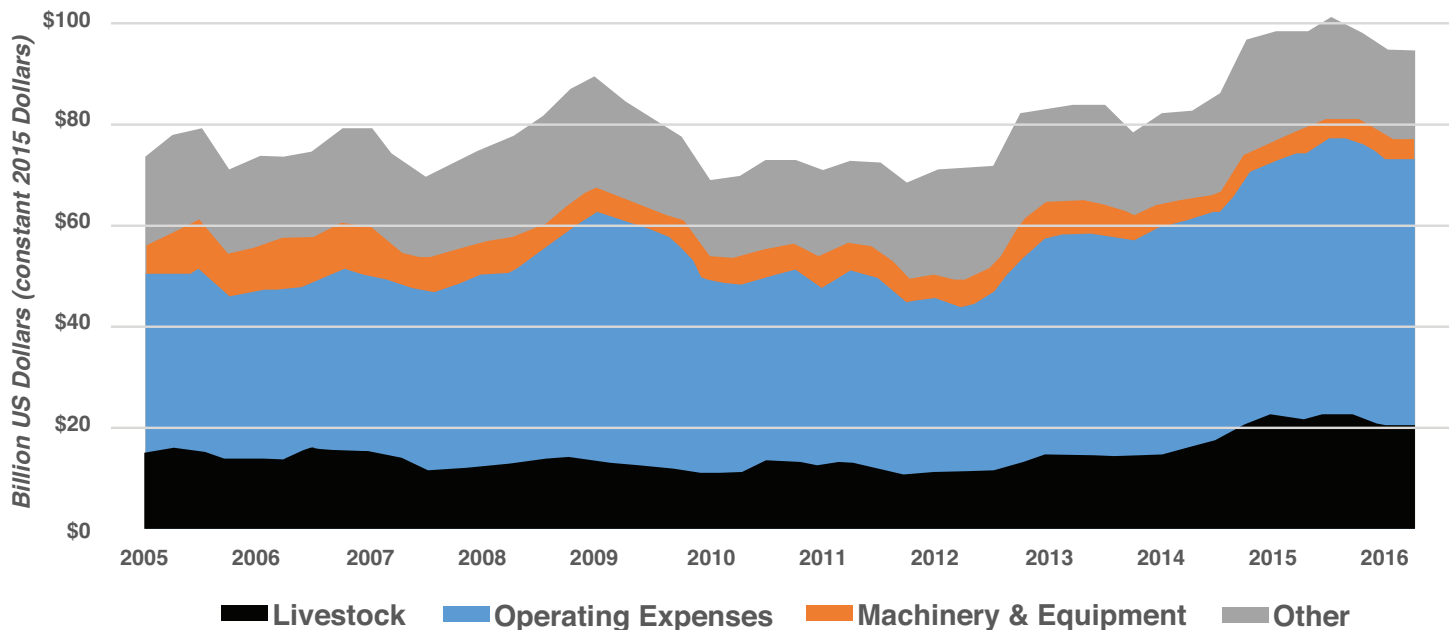
**Figure 1. Interest as a Percentage of Agricultural Production Expenses.**

Source: USDA, National Agricultural Statistics Service, Quick Stats.

## Interest Rates

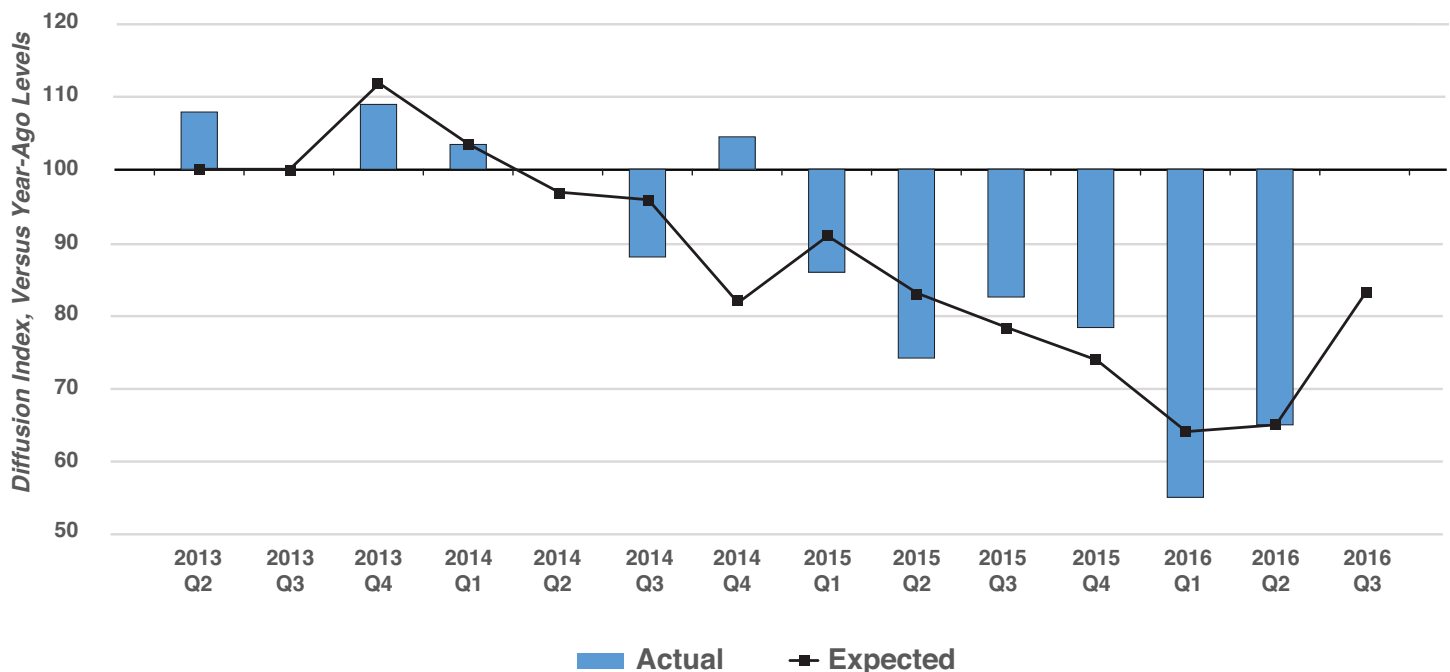
Perhaps the lone bright spot for borrowers struggling with debt has been that interest rates continue to remain low across the United States and in the Southern region. Figure 1 shows the decline in interest rates as a percentage of operating expenses. However, during

periods of farm financial hardship, high interest rates and low or negative cash flows creates a negative feedback loop accelerating leveraged farms into dangerous financial situations. If interest rates are high, and farm profitability is low or negative, servicing any new debt becomes an additional burden on an already strained cash flow situation. If the situation continues, and the



**Figure 2: Non-Real Estate Farm Loans by Purpose, 2005 - 2016.**

Source: Federal Reserve Bank of Kansas City. *Agricultural Finance Databook*, Table A.3, <https://www.kansascityfed.org/~media/files/publicat/research/indicatorsdata/agfinance/tables.pdf>



**Figure 3: Rate of Loan Repayment Across the 8th Federal Reserve District**

Source: Federal Reserve Bank of St. Louis. *Agricultural Finance Monitor*, Second Quarter 2016, p. 6.

**Table 1: Loan to Value Ratio's in the Mississippi Delta Region.**

Loan-to-value ratios for selected 2016 vs. 2015 agricultural loans			
	2016	2015	Spread
Land/Real Estate	75%	78%	-3%
Machinery/Medium Length	73.8%	75.6%	-1.8%
Cattle/Livestock	63.5%	66.8%	-3.2%

**Source:** Mississippi State University Extension, "Mississippi Credit and Lending Conditions: 2016," Publication Number P2968, <http://extension.msstate.edu/publications/publications/mississippi-credit-and-lending-conditions-2016>

producer becomes less credit worthy, the end result is often bankruptcy.

According to the Federal Reserve Bank of Dallas, fixed interest rates across Texas and Northern Louisiana remain mostly unchanged in 2016 hovering around 6% for operating, cattle, machinery, and real estate loans. Interest rates across the 8th Federal Reserve District in St. Louis which includes Arkansas, Tennessee, Northern Mississippi and Western Kentucky reports fixed interest rates slightly lower than Texas on average at around 5.2 – 5.5% for real estate and operating loans respectively. Mississippi State University's 2016 Survey of Lenders reports interest rates lower than that of the St. Louis Federal Reserve with long, intermediate, and short term rates all around 4.6%.

The benchmark for the interest rate is generally set by the US Federal Reserve. While interest rates given to farmers are usually much higher than the Federal Funds Rate, increases/decreases in the Federal Funds Rate translate into changes in what farmers can expect to pay in interest. The last increase in the Federal Funds Rate occurred in December of 2015 where the Federal Reserve increased rates from 0 - 0.25% to 0.25% - 0.50%. As recently as September 2016, the Federal Reserve announced that the next rate hike may occur toward the end of 2016. While no major plans are in place currently to increase rates much above where they stand right now, an increase of just 1% - 2% could put many producers in jeopardy of becoming unable to service any new debt.

### Credit Availability

With three successive years of low commodity prices from 2014 through the present, farmers have been forced to burn through any operating capital reserves generated in the decade prior, and recently has begun eroding asset values/owner equity. The Mississippi State University Survey of Lenders reports that 61% of Southern farmers have less than one year's operating capital available while the other 39% have just over one year remaining. The same report

finds that, on average, 21% of farm operators were unable to pay off their 2015 operating loan in its entirety and were forced to convert it into intermediate-term debt. Many in the lending and agricultural finance community believe the percentage of farmers unable to repay 2016's operating debt will be larger than last year.

The current state of higher agricultural loan demand and less favorable financial projections for Southern farms has begun to strain the Federal Farm Programs. Farm Service Agency (FSA). Demand for FSA backed operating loans were up 22% in 2016 while demand for FSA backed real estate loans were up 27% (Looker, 2016). For the most part, FSA Direct and Guaranteed loans are intended for "New and Beginning" farmers, or other targeted groups where the FSA backs loans that conventional lenders would not normally fund. However, with many producers across the United States and the South unable to cash flow their enterprises recently, demand for FSA loans has been overwhelming.

Tightening of the credit belt can be reflected in the Loan-to-Value or "LTV" ratios lenders are offering. The LTV rate is the percentage of new purchases lenders are willing to finance. A higher LTV percentage indicates that lenders are willing to take more risk and are more optimistic regarding repayment or asset appreciation. A recent publication from Mississippi State University Extension, "Mississippi Credit and Lending Conditions: 2016," based on a survey of agricultural lenders, appraisers, farm managers and agricultural economists shows that the average loan-to-value rate are lower in 2016 than in 2015 (Table 1). While earlier data is unavailable, conversations with agricultural loan officers and creditors suggest that LTV's prior to 2015 were as high as 80% or 90% for farm real estate loans prior to 2013 when asset values were appreciating rapidly.

The lower LTV rates indicate a weakening in farmer credit worthiness and repayment capacity from the lenders surveyed. Decreasing farm equipment values has also affected lenders guidelines for collateralizing debt with farm equipment. According to the 2016 Mississippi State

report, some lenders allow up to 80% of the book value of farm equipment, but the average is 62.7 on new loans.

## Summary and Outlook

The most important question going forward concerns how long input/output prices stay such that many farmers are unable to cover year to year expenses. If input costs can soften enough or farmers can forward contract themselves closer to break-even, the current farm financial situation need not look like farm financial crisis' of decades past.

However, should things continue into 2017 and beyond similar to 2014 – 2016, there does not exist an unlimited supply of loanable funds. As more and more farmers are forced into transforming operating loans into term debt, more farmers may find themselves unable to secure financing in subsequent years. Further compounding the problem is that lenders can only afford to carry a limited number of underperforming loans. Farm program have also shown that they may lack the capacity to keep up should demand for FSA backed loans increase markedly in the next few years.

Perhaps the largest concern for farmers and lenders is the erosion of creditworthiness. Debt to asset ratio's and

debt to equity ratios in 2016 remain strong, still hovering near 12.45% and 14.21% respectively. While not as low as seen in 2013 (the strongest year in the last decade), those ratio's indicate that the average Southern producer is not overleveraged. However, should producers accelerate the use of equity to finance debt, the value of their assets/equity will inevitably decline accelerating the rate of creditworthiness erosion. In essence, several successive years of losses could turn what was once a financial strength into a weakness rapidly at the same time that producers need funding the most.

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# What Does It Mean to Get an FSA Loan Guarantee, Direct Loan, or Land Contract Guarantee?

Derek Farnsworth and George M. Knappek

## Introduction

Access to affordable credit is an essential component of managing a business, especially during times of financial distress. This is particularly true in agriculture where high investment costs are common. The Farm Service Agency (FSA), is an important source of credit for agricultural producers across the country. The FSA's farm loan programs primarily target beginning and minority agricultural producers who cannot obtain credit from commercial services, with some exceptions. This article reviews the various loan options available through these farm loan programs and discusses their benefits and drawbacks. We also discuss the land contract guarantees the FSA provides to facilitate the sale of land to beginning and minority agricultural producers.

## Background

The FSA is a United States Department of Agriculture (USDA) agency responsible for the administration of a number of important government programs and services targeted towards serving agricultural producers. In this article, we focus on the farm loan programs offered by the FSA (<http://www.fsa.usda.gov/programs-and-services/farm-loan-programs/index>). Among its many duties, the FSA is responsible for providing credit to agricultural producers who represent profitable investments, but who are not currently being served by the private lending industry. Agriculture is an industry with significant barriers to entry and the FSA loan program promotes the participation of young and beginning farmers by providing loans that they would not otherwise be able to acquire. Similarly, the FSA also targets its loans to other underserved communities such as minorities, veterans, and agricultural producers who have suffered from a natural disaster (USDA-FSA, 2018).

While the FSA's overall market share for direct lending accounts for less than 3% of total farm sector debt (USDA-

ERS, 2018), 14% of all indebted beginning farms had either a loan guarantee or direct loan from the FSA. In particular, more than a quarter of beginning farms operated by a single operator and their spouse with \$100,000 or more in farm production obtained a direct or guaranteed loan from the FSA (Dodson and Ahrendsen, 2016). Beginning farmers as a group account for approximately 20% of U.S. farms (Ahearn, 2011). Thus, the FSA represents an important source of credit for entry into agricultural production.

## Producer Options

Agricultural producers have a number of loan options when dealing with the FSA. These options are detailed extensively in the FSA's handbook, "Your Guide to FSA Farm Loans" ([https://www.fsa.usda.gov/Internet/FSA\\_File/fsa\\_br\\_01\\_web\\_booklet.pdf](https://www.fsa.usda.gov/Internet/FSA_File/fsa_br_01_web_booklet.pdf)). There are two broad categories of loans available: direct loans and guaranteed loans. Direct loans originate from the FSA. Guaranteed loans originate from commercial lenders, but the FSA guarantees up to 95% of the lender's losses on the loan.

Further, the FSA provides land contract guarantees to owners of farmland who intend to sell land via a contract to beginning or socially disadvantaged agricultural producers. Beginning agricultural producers are defined as having started farming or ranching less than 10 years ago. Socially disadvantaged agricultural producers are defined as American Indians or Alaskan natives, Asians, black or African Americans, native Hawaiians or other Pacific Islanders, Hispanics, and women (USDA-FSA, 2012).

FSA loans and land contract guarantees require a comprehensive business plan. There are numerous resources for the creation of a business plan, both online and from your local cooperative extension office.

### 3.1 Direct and Guaranteed Loans

The FSA's direct and guaranteed loans are intended as a pathway for credit constrained growers to graduate to



commercial credit. As a result, the targeted loan audiences are agricultural producers that are young, minorities or women, beginners, and those who have suffered a natural disaster. These loans are designed for clients who cannot obtain credit from a commercial lender. Thus, the FSA either guarantees the majority of the loan for commercial lenders or provides the loan directly. This support is designed to facilitate the entry of underserved groups into agricultural production while simultaneously establishing a strong credit history for this clientele.

There are several subcategories of FSA direct and guaranteed loans that a producer may apply for under the Farm Loan Programs.<sup>1</sup> The following is a brief description of each. Note that the FSA has specific interest rates for direct loans (<http://www.fsa.usda.gov/programs-and-services/farm-loan-programs/index>), whereas the interest rate on guaranteed loans are determined by the lender.

### **3.1.1 Farm Ownership Loans**

Farm ownership loans are designed to enable the purchase of farmland, construct or repair buildings and other fixtures, pay closing costs, and promote soil and water conservation. These loans are available from both the direct and guaranteed loan programs. The maximum direct farm ownership loan is \$300,000. The maximum guaranteed farm ownership loan is currently \$1,392,000, but the amount may be adjusted based on inflation. Farm ownership loans are available for up to 40 years. Farm ownership microloans are also available to ease some of the loan requirements for specific clientele. These loans are obtained directly from the FSA, have a maximum loan amount of \$50,000, and are available for up to 25 years (USDA-FSA, 2012).

### **3.1.2 Operating Loans**

Operating loans support the purchase of livestock and equipment. These loans may also be used to pay for minor real estate repairs and operating expenses. Loans are available from both the direct and guaranteed loan programs. The maximum direct operating loan is \$300,000. The maximum guaranteed operating load is \$1,392,000. Operating loans are available for 1 to 7 years. Operating microloans are also available to ease some of the loan requirements for specific clientele. These loans are obtained directly from the FSA and have a maximum loan amount of \$50,000 with the same repayment period (USDA-FSA, 2012).

<sup>1</sup>FSA loans such as marketing assistance loans and farm storage facility loans are available outside the FSA's Farm Loan Programs.

### **3.1.3 Conservation Loans**

Conservation loans promote the completion of conservation practices in an approved conservation plan. These loans are available from both the direct and guaranteed loan programs. The maximum value of these loans is determined by your local FSA office. Conservation loans are available for up to 20 years (USDA-FSA, 2012).

### **3.1.4 Emergency Loans**

Emergency loans provide relief for qualifying losses from natural disasters affecting agricultural operations. These loans may replace essential property, pay production costs, pay essential living expenses, and refinance certain debts. These loans are only available from the direct loan program. The maximum emergency loan is the lower of the disaster losses or \$500,000. Emergency loans are available for 1 to 7 years, with exceptions up to 40 years (USDA-FSA, 2012).

## **3.2 Land Contract Guarantees**

Land contract guarantees are designed to provide financial security to owners of farmland who are engaging in a land contract sale to beginning or socially disadvantaged agricultural producers. There are two types of land contract guarantees: prompt payment guarantees and standard guarantees. Both land contract guarantees are managed through a third-party agent and may cover a maximum purchase price of \$500,000 on a new land contract. These contracts must be amortized for a minimum of 20 years with equal payments during the guarantee period of 10 years and cannot exceed a 6.5% interest rate (USDA-FSA, 2012).

### **3.2.1 Prompt Payment Guarantee**

A prompt payment guarantee ensures the payment of up to three amortized annual payments plus the cost of real estate taxes and insurance (USDA-FSA, 2012).

### **3.2.2 Standard Guarantee**

A standard guarantee ensures 90% of the outstanding principal balance under the land contract (USDA-FSA, 2012).

## **Why the FSA?**

As stated prior, FSA loans are designed to serve those who cannot obtain credit elsewhere. These loans specifically target underserved groups such as beginning and minority farmers. If you are currently unable to obtain commercial credit, have a valid business plan, and



qualify as an underserved individual, then you may want to consider applying for a loan guaranteed by the FSA or provided directly by the FSA. Also, you may want to consider participating in the land contract guarantee program if you intend to enter into a land sale contract with a beginning or minority agricultural producer.

There are several benefits to obtaining a loan with the help of the FSA. The most obvious benefit is the ability to obtain a loan if you are not currently able to through commercial lenders. Further, having a loan guarantee from the FSA will enable you to pay a smaller interest rate than you would otherwise due to the repayment security associated with FSA sponsorship. Similarly, the interest rates that the FSA charges when providing a loan directly are very reasonable.

Working with the FSA can also provide useful guidance and business reporting guidelines. At the end of each business cycle, your FSA loan officer will meet with you to review records, plan for the following year's operation, and help review your business plan. In addition, the FSA offers several servicing options to help avoid or resolve delinquent loan repayments. The FSA's disaster set-aside (DSA) program can let you move one annual payment to the end of your loan under certain disaster circumstances. The FSA's primary loan servicing (PLS) program may allow you to restructure your loan if you are unable to make payments due to circumstances outside your control (USDA-FSA, 2012).

There are some drawbacks associated with obtaining an FSA loan. First, the reporting and compliance stipulations may be more stringent than some commercial loans. For example, you may be required to report a variety of performance metrics and attend financial training classes. Second, the purpose of the FSA is to provide temporary credit to agricultural producers who cannot obtain commercial loans. Thus, when you are able to operate without FSA assistance, you will need to refinance your FSA loans with a commercial lender. Third, some FSA loans may not be large enough to support your operation. A common criticism of the direct farm ownership loans is that the maximum loan amount is not sufficient to meet

the complete credit needs of many larger commercial farms (Dodson and Koenig, 2007). Lastly, application timing can cause issues with obtaining a FSA loan. Each year, Congress allocates money for FSA farm loans, but these funds may run out before the end of the fiscal year and cause a waiting list to form. The fiscal year begins in October, so that is often the best time to apply for a FSA loan (USDA-FSA, 2012).

## Conclusion

The FSA's farm loan programs are an important source of credit for beginning and minority agricultural producers. Knowledge of these programs can help agricultural producers gain access to credit that may not otherwise be able to. These programs can also facilitate the sale of land and ensure payment when a beginning or minority agricultural producer is involved in the purchase. Overall, the purpose of the FSA's role in these credit markets is to correct for market failures and graduate participants to the use of commercial credit. If you think you may qualify for a FSA loan, please consult your local FSA agent and read more about these programs at the FSA farm loan programs website (<http://www.fsa.usda.gov/programs-and-services/farm-loan-programs/index>).

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# Things to Consider When Trying to Weather the Storm

Brian R. Williams, Aaron Smith, and Jordan M. Shockley

## Introduction

The days of \$7.00 corn and \$16.00 soybeans, which were great while they lasted, are unfortunately behind us. In their place are corn prices that are under \$4.00 and soybean prices that are under \$11.00, and barring a major crop failure, it looks like that is where prices are going to stay. While crop prices have fallen rather quickly, production costs and land prices are responding much more slowly. According to Mississippi State University's planning budgets, the variable costs of producing a bushel of irrigated corn were \$3.31/bu for the 2016 growing season compared to \$3.48/bu during the 2012 growing season, when prices peaked. According to those same budgets, the cost of producing a bushel of soybeans has actually increased from \$5.73/bu in 2012 to \$9.46/bu in 2016. Several factors have gone into the increase in the cost of producing a bushel of soybeans. The biggest contributing factor is a near tripling of the herbicide cost due to herbicide resistant weeds. Fungicide costs in 2016 are also almost three times as much as they were in 2012. Fertilizer, seed, and equipment costs are also slightly higher. With a tightening of profit margins in recent years and with a low price environment expected for the near future, careful management and planning has become increasingly important. This publication is intended to provide crop producers with a few ideas and strategies that can be implemented to help to manage their operations in a more efficient manner.

There are a few strategies that one can take to help to "weather the storm" in the face of lower crop prices and tighter (negative) margins. In this article, we break down the options into short-term strategies and medium-to-long-term strategies. Short-term strategies include actions that can be taken immediately such as budgeting, creating a marketing plan, and taking a closer look at input costs and efficiencies. Medium and long-term strategies include diversification, capital expenditure planning, and examining land values and/or rental agreements.

## Short-Term Options

### *Budgeting, Planning, and Examining Input Costs*

Creating a budget specific for each enterprise is a critical step in weathering the storm during times of tightening margins. Producers who farm land with dramatically different cost structures for a specific commodity should develop multiple budgets. This will assist in making other decisions such as the cash rent that could be paid for each farm. A budget can help to determine break-even prices, estimate cost of production, identify areas to cut costs, and can allow the decision maker to analyze the impacts changes might have on an operation's profitability. Additionally, a budget will allow producers to examine which expenses are front loaded and which are dependent on conditions during the growing season (weather and environmental factors). For example, cash rents and seed technology are incurred up front as such there is no flexibility to adjust these costs during the growing season. On the other hand herbicide applications and irrigation costs can be adjusted based on weed pressure and rainfall.

Several Land Grant Universities across the South have published readily available enterprise budgets for most major row crops in the region. Agricultural Economics Departments at Mississippi State University, University of Tennessee, University of Kentucky, University of Arkansas, and Texas A&M have published budgets specific to their own regions. These budgets are a great starting point when creating a personalized budget specific to the commodities grown on your operation. Some of them are available in an Excel format that can be easily downloaded and edited to fit each individual's needs. It is very important to make sure that the information used in constructing a budget is as accurate as possible.

Once an enterprise budget has been constructed, there are several ways that it can be used. One of the most important ways that a budget can be used is to determine cost of production, break-even prices, and marketing price points. A break-even price is typically calculated

**Table 1. Soybean net return table for different yield and price combinations assuming a cost of production of \$428/acre.**

**Soybean - Net Returns (\$/acre)**

		<b><u>Yield (bu/acre)</u></b>										
		<b>20</b>	<b>25</b>	<b>30</b>	<b>35</b>	<b>40</b>	<b>45</b>	<b>50</b>	<b>55</b>	<b>60</b>	<b>65</b>	<b>70</b>
<b><u>Price (\$/bu)</u></b>	<b>7.00</b>	(288)	(253)	(218)	(183)	(148)	(113)	(78)	(43)	(8)	27	62
	<b>7.25</b>	(283)	(247)	(210)	(174)	(138)	(102)	(65)	(29)	7	43	80
	<b>7.50</b>	(278)	(240)	(203)	(165)	(128)	(90)	(53)	(15)	22	60	97
	<b>7.75</b>	(273)	(234)	(195)	(157)	(118)	(79)	(40)	(2)	37	76	115
	<b>8.00</b>	(268)	(228)	(188)	(148)	(108)	(68)	(28)	12	52	92	132
	<b>8.25</b>	(263)	(222)	(180)	(139)	(98)	(57)	(15)	26	67	108	150
	<b>8.50</b>	(258)	(215)	(173)	(130)	(88)	(45)	(3)	40	82	125	167
	<b>8.75</b>	(253)	(209)	(165)	(122)	(78)	(34)	10	53	97	141	185
	<b>9.00</b>	(248)	(203)	(158)	(113)	(68)	(23)	22	67	112	157	202
	<b>9.25</b>	(243)	(197)	(150)	(104)	(58)	(12)	35	81	127	173	220
	<b>9.50</b>	(238)	(190)	(143)	(95)	(48)	(0)	47	95	142	190	237
	<b>9.75</b>	(233)	(184)	(135)	(87)	(38)	11	60	108	157	206	255
	<b>10.00</b>	(228)	(178)	(128)	(78)	(28)	22	72	122	172	222	272
	<b>10.25</b>	(223)	(172)	(120)	(69)	(18)	33	85	136	187	238	290
	<b>10.50</b>	(218)	(165)	(113)	(60)	(8)	45	97	150	202	255	307
	<b>10.75</b>	(213)	(159)	(105)	(52)	2	56	110	163	217	271	325

prior to planting based on a yield target that is realistic for the production practices and land characteristics. This is calculated by simply dividing the total cost (\$/acre) from the budget by the targeted yield. The result provides the price needed to cover all anticipated costs. The break-even price is extremely useful for budgeting purposes; however, during the growing season yield expectations and prices are continuously changing. As such, it is advisable to examine multiple yield and price combinations for a specific cost of production. For example, Table 1 shows the expected net returns for different yield and price combinations for soybeans with a cost of production of \$428/acre. Profitable combinations of yield and price are shown in black, losses are shown in red. A basic profit table will allow producers to make more informed marketing decisions during the production year as expected yield and prices change. In a low price environment, it is important for producers to remember that profit maximization, not yield maximization, is the goal. Producers should carefully weigh the cost and revenue trade-offs for each input and management decision.

Unfortunately, regardless of marketing strategy, sometimes prices available in the market will not exceed break-even, thus creating a shortfall. Herein lies the importance of examining the costs within the budget and identifying ways to reduce costs and/or examine

alternatives. When cutting costs it is important to keep in mind the corresponding changes in yield and/or revenue that will occur. For example, one might be able to significantly cut costs by reducing fertilizer or pesticide application, but making such cuts may also dramatically reduce yields and leave net returns unchanged or increase losses. Before making dramatic changes to inputs, it is recommended that producers consult with a local agronomist to determine the potential impact on yield. Removing the guess work from management decisions is a cost effective way to increase input efficiency. For example, soil testing at a University, government, or private lab can be a cost effective way to reduce fertilizer costs without reducing potential yield. Once the impact is known, put the changes into the budgets to estimate if they will improve profitability. In other words, try it out on paper first.

### ***Risk Management Plan***

Risk can come in many different forms. The two major forms of risk in agriculture are risks that reduce net worth and risks that reduce annual income. Examples of forms of risk that can reduce net worth include natural disasters that cause a loss of assets such as buildings and equipment, reduction in asset values (declining land prices), and increased debt. Risks that can reduce annual

net income are caused by factors such as low yields, low prices, higher costs, and changes in government policy. With so many sources of risk, it is important to have a risk management plan in place. While a risk management plan can never completely eliminate risk, the goal should be to limit exposure to risk and to avoid situations where the health of the operation could be compromised. One of the most common methods of reducing risk is through crop insurance. While there are many options available, the most common are those that protect against yield risk and those that protect against revenue risk. Purchasing a crop insurance policy is a good starting point to mitigate revenue or yield risk; however, additional complementary risk management strategies should be explored. Having a risk management plan that works in conjunction with your marketing plan can further reduce risk and provide cost savings through eliminating duplicate fees, premiums, or other expenses.

### ***Create a Marketing Plan***

Marketing is a continuous process that should span crop production years (*i.e.* pricing a portion of an estimated crop when a profitable opportunity emerges is always highly desirable regardless if it is the current crop or a crop to be produced in future years). On an annual basis, the first step in developing a marketing plan is determining the cost of production, break-even price, and marketing price points, as discussed above. The second step in developing a marketing plan is evaluating crop insurance coverage. After the price determination period for a commodity and region, producers should determine how much revenue or yield is protected by their crop insurance policies. The projected price (spring crop insurance price) sets the price floor for many marketing plans. Use the projected price and your APH yield as a starting point in your marketing plan and look for pricing opportunities that are above this price during the growing season.

Next the marketing plan should determine how much production should be sold at different price points and different times of the year. When trying to obtain the best price, there are often two strategies. The first is an offensive strategy where the producer waits until prices reach a certain predetermined level at which all costs are covered, and when they do the crop is sold. A defensive strategy occurs when some of the crop is sold at a predetermined trigger price in an attempt to prevent lost revenue. Incremental pricing is usually preferable as it spreads out marketing risk; however it is also important to match pricing with key production phases for your crop. For example, corn production can be divided into

five marketing periods (a rough estimate of the percent of estimated production that could be priced): pre-planting (0%-25%); planting and emergence (10%-40%); tassel, pollination, and silk (20-60%); dough, dent, and mature (40%-75%); and harvest and post-harvest (50%-100%). The amount of estimated production priced will vary depending on the producers risk tolerance, crop progress and condition through the growing season, production practices, and the production variability of one's farms. It is important to continually revisit a marketing plan to incorporate changes in local, national, and global supply and demand, changes in estimated production on your farms, and changes in prices available. One cautionary note is for producers to avoid exchanging price risk for production risk (*i.e.* pricing more crop than will ultimately be produced).

There are also a few tips to remember when developing a marketing plan. First of all, it is best to avoid marketing all of one's production at one time. Disasters and crop failures can and do occur. Second, don't shoot for the moon. It is difficult, if not impossible to consistently hit the top of the market. Rather than aim for the best price possible, it is smarter to take the mindset that if you can lock in a profit, go ahead and do it. Lastly, keep your marketing plan sufficiently simple and flexible. Complicated marketing plans can be challenging to implement and often lack the flexibility to quickly react to changes in price or yield.

### **Long-Term Options**

#### ***Building Working Capital***

Working capital are the funds that are readily available to meet short-term financial obligations. Working capital is usually calculated by subtracting the farm's total current liabilities (operating loans, unpaid taxes, accounts payable, etc.) from the farm's current assets (cash, grain inventory, fertilizer, seed, etc.). Working capital acts as a financial reserve that is accumulated during surplus years to help a farm meet financial obligations during periods of financial stress. It is recommended that farmers try to maintain a working capital of 15-35% of gross revenue or total expense, especially given the volatility of today's markets.

All current assets are not equally important. The market value of grain inventory will change due to quality deterioration and price decreases, as such cash reserves provide more stability than inventory. Additionally, cash does not incur storage costs. Sufficient cash reserves provide a major benefit by allowing a producer to take advantage of opportunities in down markets that others



cannot, such as buying discounted machinery or land from those that are forced to sell assets.

There are a few ways a producer can manage working capital. When grain is sold, the cash generated can be used in several ways. Revenues can be used to pay liabilities, purchase inputs for the next season, or to make capital purchases. As explained below, carefully planning capital expenditures can assist in building working capital. During good years, producers are strongly encouraged to build cash reserves (yes, this may necessitate paying some income taxes!). Producers often develop strategies that minimize income tax for the current year without considering the long term benefits of paying some tax up-front in order to have flexibility in the future (capital purchases, estate planning etc.). Developing a long term strategy will help guide year-to-year decisions.

Another way to build working capital is to reduce current liabilities. While shorter repayment schedules on capital purchases may look feasible during surplus years, the larger principal payments can reduce working capital in years of financial stress. Capital assets that are not needed could also be sold to increase working capital, however tax implications must also be considered when liquidating assets.

Debt restructuring can be used to improve working capital. However, the underlying financial issues, which led to the diminished working capital, need to be addressed before restructuring debt. Additionally, moving current debt to intermediate or long term debt requires unencumbered assets to be pledged as security. Continued restructuring of debt will erode equity and may eventually necessitate exiting the industry. As such, careful evaluation of all alternatives (asset sale, retirement, exiting the industry, etc.) should be considered prior to restructuring debt.

### ***Diversification***

Growing more than one crop can often help mitigate price and production risk. Diversification generally means planting more than one crop, often in a rotation, in an attempt to increase farm profitability and sustainability. Diversifying a farming operation with a crop rotation system can help to manage insect infestations, reduce weeds, and improve soil health. It can also spread price risk over several crops. A prime example of how diversifying crops can help Southern producers mitigate price risk can be found in the 2016 growing season. At the same time that corn and soybean prices were falling, cotton prices spiked to levels that had not been seen in nearly two years. The correlation between the prices of the commodities is important to consider if revenue diversification is the goal. For example, corn and sorghum prices are typically

highly correlated so how diversified is your revenue if both commodities are planted?

Production risk can also be managed through crop diversification. Most crops mature at different times during the growing season and critical points where rainfall is needed will fall at different times for different crops. For example, a mid-summer drought may be devastating for the corn crop, but a winter wheat crop will already be harvested by that point, and if weather patterns change and bring timely rains later in the season then cotton or soybean yields may still be good. Another prevalent benefit of crop diversification is weed and pest control. Rotating crops often results in different chemical applications that can be beneficial in managing resistant weeds or insects, thus reducing production risk. Furthermore, it is important to have diversification in chemistry to control weeds and insects.

Southern producers are at an advantage over many areas of the country due to the diversity of crops that can be produced. In addition to corn, soybeans, and wheat that are grown across much of the country, other options are available such as cotton, rice, sorghum, canola and peanuts that can be viable alternatives in a crop rotation. However, producers must also keep in mind that there are a few downfalls of growing additional crops. Probably the biggest downfall is the need for additional equipment. Cotton in particular will require specialized equipment for harvesting that can present a significant up-front investment cost. There is also a learning curve when considering a new crop, and it can often take several years of trial and error to perfect growing the new crop. If growing additional crops is not an option or too costly, trying capitalizing on local markets that demand higher quality grain. Milling companies and distilleries often offer larger premiums for higher quality grain (e.g. #1 white/yellow corn, less stress cracks and lower). Harvest and post-harvest management is critical to insure higher quality grain to meet the specifications required from these alternative markets. More specifically, harvest timing, harvest speed, grain dryer management, and grain storage monitoring are key to ensure higher quality grain.

### ***Capital Expenditure Planning***

Maintaining a suitable equipment complement for row crop producers can be extremely costly. The complexity and size of row crop equipment has increased substantially over the past 25 years, resulting in increased fixed (depreciation and capital recovery) and variable (operating and repair and maintenance) costs. Additionally, in periods of high row crop prices, such as 2006-2012, producers had a propensity to purchase equipment to avoid taxes, thus

creating surplus equipment capacity (equipment that would be sufficient to farm a greater number of acres than are presently being farmed). Surplus capacity can be beneficial for operations that are expanding or are looking to generate additional income via custom work and/or equipment share arrangements. However, unless these alternatives are available to spread out fixed costs surplus machinery can dramatically increase a producers cost of production. Reducing machinery costs can dramatically reduce the cost of production.

The value of equipment can decrease dramatically as commodity prices decrease and stay below the cost of production, creating additional financial stress. If the asset is financed, the current value may not be sufficient to liquidate the loan, requiring working capital or liquidation of other assets to retire the loan should the equipment need to be sold. An additional concern could be created from producer use of section 179. Section 179 allows producers to elect to recover all or part of the cost of certain qualifying property, up to a limit, by deducting depreciation in the year the equipment was purchased (IRS, 2016). Producers can elect the deduction instead of recovering the cost by taking annual depreciation deductions. Section 179 can create adverse future tax consequences if machinery must be sold. As such it is important to evaluate the market value of equipment, financing arrangements, and potential tax liabilities should the equipment need to be liquidated (add reference to Tufts accelerated depreciation article?).

Producers should assess their equipment compliment on an annual basis and make a short and long term plan for machinery replacements and new purchases. Annually, producers should ask themselves:

- Do I need to replace an existing piece of equipment?
- Has the amount of acreage or crop mix changed?
- What are my short and long-term machinery replacement/purchase needs?
  - o Creating a prioritized list may be extremely beneficial.
- Do I have surplus machinery capacity that can provide additional income?
- Does my county or region have access to custom machinery operations?
- Could a machinery share arrangement be possible with a neighbor?

By evaluating machinery needs annually producers can better foresee medium and long-term needs as well as identify emerging opportunities to reduce equipment costs.

Custom farming can also help to avoid or postpone the sale of machinery when there is surplus machinery capacity while also generating additional revenue. Machinery purchases should be closely evaluated in conjunction with lease agreements as changes in land base overtime can dramatically alter machinery cost structure.

### ***Examining Land Rental Agreements***

Land prices and subsequently cash rents peaked across the Southern region in response to increased row crop prices seen during 2006-2012. However, they have yet to adjust in the magnitude required to reflect the recent downturn in commodity markets. This has resulted in land cost, specifically cash rents, representing the largest input cost of production for most in the region. This is evident once an enterprise budget is constructed as recommended previously. In addition to representing the largest input in the cost of production, cash rental agreements also result in the tenant bearing all the risk. This can be troublesome in a time when larger equipment is being purchased (as stated above) and additional land is required at peak prices to drive machinery costs lower. So how can producers manage this cost of production?

Renegotiating cash rental agreements to a lower price is one option. However, in all land rental renegotiations a good relationship between the producer and the landlord is key. Without a good relationship, new arrangements will be near impossible. Transparency is also key during negotiations with a landlord. Share enterprise budgets with the landlord so they understand what it costs for you to produce a crop and what you can afford to pay in cash rent. Also, understanding what other land in your area or region is renting for can help, especially when dealing with an absentee landowner.

Crop share or flex leases are other land rental agreements that should be considered as alternatives to cash rental agreements. Under a crop share agreement, both the tenant and the landowner share the risk proportionately based on input costs and/or output. A flex lease is a hybrid agreement between a cash rent and a crop share. Both allow you to decrease your cash outlay compared to a traditional cash rental agreement while sharing some risk with the landowner, however the tenant must forgo some profit potential. There are many options when structuring a crop share or flex lease so utilizing the available resources to customize an agreement that works for both the tenant and the landlord is critical. The North Central Farm Management Extension Committee has developed guidelines for both flex lease and crop share arrangements. In addition, the University of Kentucky has developed a

Flexible Cash Lease Decision-Aid to assist in determining the right flex lease arrangement, base rent, and bonus structure for the landowner. This can also be used to compare against a traditional cash rent agreement.

Renegotiating a new land rental arrangement takes time and willingness from both tenant and landowner. However, 100% of the acres do not need to be renegotiated to an alternative agreement. Start out with a portion of the land under a new arrangement until both parties are comfortable. Another option is renegotiating to short-term arrangements, such as one-year, to see where the commodity market is at that point. The ability to decrease the overall cost of production hinges on the tenant landowner relationship and the willingness of both parties adjust to this new commodity market.

### **Consequences and Conclusions**

The current market outlook of corn prices under \$4.00 and soybean prices under \$11.00, will likely remain for the foreseeable future. At the same time, producers will continue to face high production costs and land prices. While production costs and land prices may fall in the future, any declines will take several years to fully materialize. In the meantime, producers will be faced with tight and/or negative margins each year that can quickly evaporate any equity that was built up during the high price period. Such a situation can make operating loans difficult to secure and may force many beginning farmers and those who are not financially secure to exit the industry. Additionally, producers who are approaching retirement

with no heir to the operation may choose to exit the industry rather than burn existing equity.

Despite the tight (negative) margins that producers face, there are actions that can be taken to minimize losses and/or improve profitability and improve a farm's financial stability. In the short term, producers can be more aware of his/her cost structure by constructing detailed enterprise budgets for each commodity grown. This can help to estimate a per-bushel cost of production that can be used to determine a target price in a risk management and marketing plan. A budget can also help to identify areas where costs can be cut and the impact that cost cutting measures have on profitability. In the long term, farmers can find ways to diversify income. By growing a variety of crops in a crop rotation or targeting alternative markets, both price and production risk can be managed. While one crop may sustain losses in price or production, another crop may perform well. Capital expenditure planning is another long-term strategy that can improve a farm's financial sustainability. Evaluating equipment needs and purchases each year allows a producer to plan ahead and identify ways to reduce equipment costs. Finally, examining current land rental agreements and renegotiating terms can be a mechanism to reduce production costs. Landowner-tenant relationships, transparency, and willingness of both parties to make changes is key during renegotiations.

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# Things to Consider When Looking at Alternative Row Crops

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Producer interest in alternative enterprises often increases during periods of low farm income resulting from low prices, poor production or increasing risk environment. Row crops in particular have seen increased volatility in both prices and yields the last ten years. Producers may consider other row crops in hopes of better returns or reducing risk. Farm operations may look at alternative enterprises because of increased competition, loss of local markets, policy changes that affect profitability or lower the barriers of market entry, expansion of the farming operation, enterprise diversification, improving cash flow, or bringing new partner or family member into the operation.

Some examples of alternative row crops in the South that have received interest in the last decade include canola, grain sorghum, peanuts, sesame, sweet potatoes, and sunflowers. Research has been conducted on alternative crops for bioenergy production due to interest in cellulosic ethanol and biodiesel driven by the renewable fuels mandates. Research on crops like *camelina*, *miscanthus*, sugarcane, sweet sorghum, and switchgrass can be found

around the South in hopes of developing a market. Interest in hemp production is increasing as some states are allowing production for research following the 2014 farm bill. If and when consumer preferences shift for natural fiber from renewable sources, crops like hemp might become a profitable alternative.

Organic production of row crops is another alternative that farmers may look at adding to or transitioning their operation. Medium to small scale farms may look at organics due to barriers in achieving larger scale of production in conventional row crops. Local demand may encourage looking at transitioning to organic production as niche market. The demand for organic feedstuffs and oilseeds will increase with increases organic meat and milk production. Organic grains and oilseeds for food use are alternatives that may have potential.

A comprehensive risk assessment is necessary to identify and manage the risk exposure of operating your business. While adding a new enterprise sounds good, producers often miss the “unintended consequences.” Risk



Figure 1. Five Areas of Business Risk.

assessments identify the risk in each area of the business and determine if the business can manage the associated risk successfully. The assessment should cover five areas of business risk – Production, Market, Financial, Legal, and People (Figure 1). Answer yes or no to the following questions. Review your answers with your business team, family and employees. You may identify some risk exposure.

**Production:** Do you have:

- \_\_\_ 1. Management capability to produce the new and existing products?
- \_\_\_ 2. Fertility or pest protection or rotational restrictions that conflict with any products?
- \_\_\_ 3. Access to equipment necessary for producing the products?
- \_\_\_ 4. Crop or livestock insurance available in the event of loss?

**Market:** Do you have:

- \_\_\_ 5. Knowledge of all marketing opportunities for each product?
- \_\_\_ 6. Profitable forward pricing options for products?
- \_\_\_ 7. Revenue insurance to manage risk of forward pricing?
- \_\_\_ 8. A *written* marketing plan that coordinates with your financial and production plans?

**Financial:** Have you:

- \_\_\_ 9. Developed a *written* business plan that includes:
  - a. A most likely scenario for the new enterprise and whole business?
  - b. A worst case scenario for the business and its financial sustainability?
- \_\_\_ 10. Determined the cost of production for each enterprise?
- \_\_\_ 11. Calculated the break-even market prices for various production levels?
- \_\_\_ 12. Evaluated the important financial ratios historically and projected?
  - a. Profitability
  - b. Financial Efficiency
  - c. Debt Repayment Capacity
  - d. Liquidity
  - e. Solvency
- \_\_\_ 13. Reviewed your financial situation with a business advisor, lender and accountant?

**Legal:** Have you:

- \_\_\_ 14. Reviewed and understood the provisions of all contracts, leases, and loans?
- \_\_\_ 15. Reviewed the business exposure to liability arising from
  - a. Direct marketing?
  - b. Public admittance to your property?
  - c. Environmental & crop protection issues?
  - d. Water use regulations?
  - e. Land use issues with neighbors?
- \_\_\_ 16. Evaluated different business entity structures?
- \_\_\_ 17. Developed a good working relationship with an attorney and accountant?
- \_\_\_ 18. Maintained compliance with government regulations such as:
  - f. Worker protection?
  - g. Pesticide use records?
  - h. Truck and vehicle registrations?
  - i. Safety inspections

**People:** Have you:

- \_\_\_ 19. Conveyed the goals and objectives of the business with
  - f. Business management team?
  - g. All family members?
  - h. All employees?
  - i. Your attorney, accountant, and lender?
- \_\_\_ 20. Confirmed that everyone on your team is employed to the full extent of their education, training and experience?
- \_\_\_ 21. Evaluated your risk exposure to employee accidents and dishonesty?

**What other risks can you identify?**

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**Risk Assessment Example**

*Suppose you were considering adding **Grain Sorghum** as an alternative row crop enterprise. How would you assess the risk?*

**Production:** Do you have:

- 1) **Yes** – Management capability to produce the new and existing products?
- 2) **No** – Fertility or pest protection or rotational restrictions that conflict with any products?

- 3) **Yes Growing Corn/Sb Now** – Access to equipment necessary for producing the products?
- 4) **Yes, But No Production History** – Crop or livestock insurance available in the event of loss?

**Market:** Do you have:

- 5) **Yes, But Basis Is Not Good** – Knowledge of all marketing opportunities for each product?
- 6) **No, Limited Market** – Profitable forward pricing options for products?
- 7) **Yes, But Low Aph For Ci Purposes** – Revenue insurance to manage risk of forward pricing?
- 8) **No, Have Not Compiled** – A written marketing plan that coordinates with your financial and production plans?

**Financial:** Have you:

- 9) **No** – Developed a *written* business plan that includes:
  - a. **No** – A most likely scenario for the new enterprise and whole business?
  - b. **No** – A worst case scenario for the business and its financial sustainability?
- 10) **Yes, University Budget** – Determined the cost of production for each enterprise?
- 11) **Yes, Based On University Budgets** – Calculated the break-even market prices for various production levels?
- 12) **No, Rely On Bank To Determine** – Evaluated the important financial ratios historically and projected?
  - j. Profitability
  - k. Financial Efficiency
  - l. Debt Repayment Capacity
  - m. Liquidity
  - n. Solvency
- 13) **No, Accountant Reviewed Tax Situation** – Reviewed your financial situation with a business advisor, lender and accountant?

**Legal:** Have you:

- 14) **No, Contract Not Available** – Reviewed and understood the provisions of all contracts, leases, and loans?
- 15) **No** – Reviewed the business exposure to liability arising from:
  - j. Direct marketing?
  - k. Public admittance to your property?

- l. Environmental & crop protection issues?
- m. Water use regulations?
- n. Land use issues with neighbors?

- 16) **Not Applicable** – Evaluated different business entity structures?
- 17) **No** – Developed a good working relationship with an attorney and accountant?
- 18) **No, Don't Think Applicable** – Maintained compliance with government regulations such as:
  - o. Worker protection?
  - p. Pesticide use records?
  - q. Truck and vehicle registrations?
  - r. Safety inspections

**People:** Have you:

- 19) **No** – Conveyed the goals and objectives of the business with
  - o. Business management team?
  - p. All family members?
  - q. All employees?
  - r. Your attorney, accountant, and lender?
- 20) **No** – Confirmed that everyone on your team is employed to the full extent of their education, training and experience?
- 21) **No** – Evaluated your risk exposure to employee accidents and dishonesty?

**What other risks can you identify?**

1. **Have Not Identified Marketing Options**
2. **Do Not Know What “Variety” To Plant**
3. **Have Not Discussed With Crop Insurance Agent.**

Based on the risk assessment shown above, should the producer add *Grain Sorghum* to their crop mix? NO. They have several risks that need to be addressed before diversifying their operation. Even if they do not add *Grain Sorghum*, they should develop a business plan for the business that addresses all of the risk facing the business.

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# Things to Consider when Looking at Alternative Specialty Crops

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## Introduction

USDA's Agricultural Marketing Service defines specialty crops as "fruits and vegetables, tree nuts, dried fruits, horticulture, and nursery crops (including floriculture)" as per Section 101 of the *Specialty Crops Competitiveness Act of 2004* (7 U.S.C. 1621 note) and amended under section 10010 of the *Agricultural Act of 2014, Public Law 113-79* (the Farm Bill). Examples of the more than 170 USDA-recognized specialty crops are included in Table 1. According to the *2012 U.S. Census of Agriculture*, nearly 245,000 farms produced specialty crops on nearly 69.4 million acres and generated \$83.4 billion in market value of products sold (USDA, 2015a). Nearly 43% of specialty crop acreage was in orchard production (citrus, noncitrus, and tree nuts), while 29% of acreage was used to grow vegetables. Nursery, greenhouse, and floriculture crops were grown on 22% of specialty crop acreage.

Given the wide variety of US-grown specialty crops, farms are located across the country although production tends to cluster in certain geographic regions due to production and marketing considerations. For many of these crops, imports exceed exports to meet growing consumer demands. While fresh and processed fruit and vegetable US exports totaled \$8.5 billion in 2015, US imports exceeded \$20 billion, shifting the United States from a net exporter in the early 1970s to an increasingly net importer in spite of growing export volumes (Johnson, 2014).

A producer's decision to produce specialty crops is motivated by numerous internal and external factors, which are captured in the SWOT diagram (Figure 1).

## Background – Current Risk Assessment

Across nearly all types of specialty crop farms, about one-third of operators are women (USDA, 2015 [b]). Interestingly, 110,325 (45%) of specialty crop operators indicated that their primary occupation is NOT farming, and less than eight percent indicated that all of their income was generated from their specialty crop enterprise (USDA, 2015[c]). Yet, approximately 105,000 (43%) of specialty crop operations reported hiring farm labor, and employed 1.35 million workers in 2012 (USDA, 2015[d]). Orchards accounted for 48% of total hired laborers, while vegetable and nursery, greenhouse, and floriculture operations required 399,977 and 345,247 laborers, respectively, to produce and harvest their products.

Federal and state level support, such as the 2002 Technical Assistance for Specialty Crop (TASC) program, designed to improve producer access to global markets has resulted in increases in export values for specialty crops from \$7.3 billion in 2002 to \$21.6 billion just ten years later as shown in Figure 2 (USDA, 2013). Several southeastern US states have received TASC funding, including Florida, Georgia, South Carolina, North Carolina, and Virginia.

While the export market has grown and trade barriers continue to diminish through newly negotiated trade

**Table 1. Examples of Common USDA-Recognized Specialty Crops.**

Fruit and Tree Nuts	Vegetables	Culinary Herbs and Spices	Horticulture	Annual Bedding Plants	Deciduous Shrubs
Almond	Broccoli	Allspice	Honey	Begonia	Barberry
Apple	Pea	Basil	Turfgrass	Dahlia	Hibiscus
Blueberries	Okra	Cumin	Hops	Impatiens	Rose
Mango	Pumpkin	Mint	Tea leaves	Pansy	Virburnum
Pecan	Lentils	Paprika	Maple syrup	Snapdragon	Bubbliea
Olive	Watermelon	Dill		Marigold	Hydrangea

Source: USDA-AMS website (2016). Link to inclusive list: <https://www.ams.usda.gov/services/grants/scbgp/specialty-crop>

agreements, the complications associated with exporting fresh produce and live horticulture/floriculture products are numerous and ever-changing. A summary of the trade issues facing US specialty crop producers is included in the *USDA Specialty Crop Trade Issues 2013 Annual Report to Congress* and producers are encouraged to learn more about these issues prior to exploring export market opportunities.

USDA's Risk Management Agency provides interactive crop insurance program reports along with [maps](#) indicating where insurance products are available, by county, nationwide. Coupled with high initial establishment costs, the perennial nature of many specialty crops, and operator investment in direct marketing channels, crop insurance protection is an underutilized risk management tool across this industry. It is worth noting that while there are almost two hundred recognized specialty crops, only a few specialty crop operators have the opportunity to manage production risk exposure through crop insurance protection due to limited availability of programs.

A major source of market risk for specialty crop producers are volatile market prices coupled with wide variability in market supplies, particularly for fresh product forms or those with limited or costly storage options (sweet onions, citrus). The majority of specialty crop operations sell directly to retailers and/or the final consumer and quality expectations are stringent, forcing growers to deliver products quickly or risk losing major buyers in case of any complaints about product defects. Harvest labor costs

typically represent 30%-80% of annual operating costs, and in some cases where market prices are low, crops may even be left in the field to avoid these expenses. Harvest windows may extend for just 4-6 weeks, resulting in near-total crop losses should excess rain, drought, or heat occur during that timeframe. Colder weather may also push harvest times back in Southeastern regions, allowing time for Northern regions to provide larger volumes, driving grower prices down by as much as 50% within just a few days' time. There are no futures markets options available to specialty crop growers, which greatly reduces their ability to profitably mitigate their risk exposure to changes in market prices.

## Opportunities and Challenges

The US Secretary of Agriculture and the US Secretary of Health and Human Services encourage increased fruit and vegetable consumption by issuing a new set of dietary goals and nutrition guidelines for Americans (hereinafter 2015 DGA). The thrust of the 2015 DGA, otherwise referred to as MyPlate, is to substantially reduce intake of calories and fats as part of the fight against obesity. This goal is accomplished by: (1) increasing vegetable and fruit consumption to the point where their portions account for half of the MyPlate consumption; (2) increasing whole grain consumption; (3) substituting fish and nuts for red meats; and (4) substituting skim milk, soymilk, yogurt,

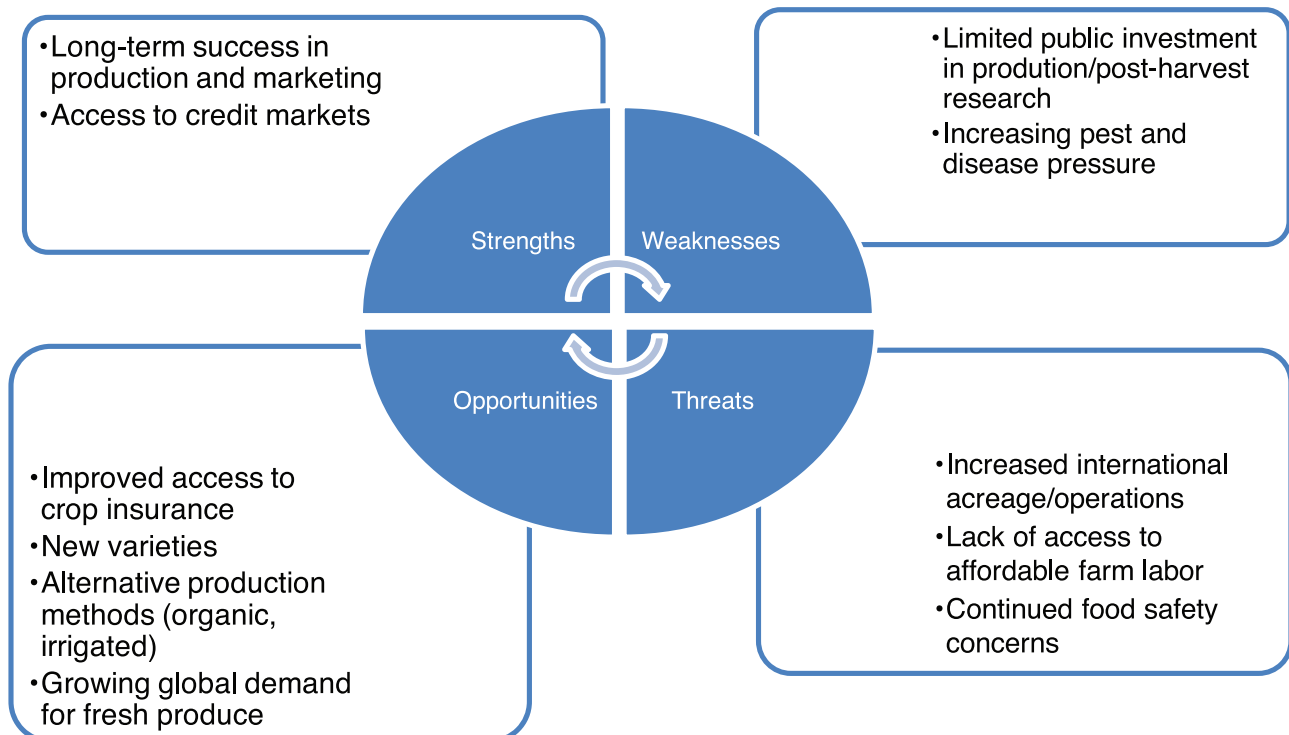


Figure 1. SWOT Analysis of US Specialty Crop Production and Marketing.



and cottage cheese for higher fat/calorie dairy products, including full-fat milk, chocolate milk, cheese, butter, etc.

The total availability of fruit (domestic production + imports - exports) will need to increase by 127.9% to meet the 2015 DGA's recommended amount. In addition, the total availability of vegetables (domestic production + imports - exports) will need to increase by 56.5% to meet the 2015 DGA's recommended amount. This potential increase in demand would be beneficial to the fruits and vegetable industries as higher demand leads to higher prices. However, US producers need to be able to compete with imports from Mexico, Central and South America, and Canada, among others.

### Potential Consequences

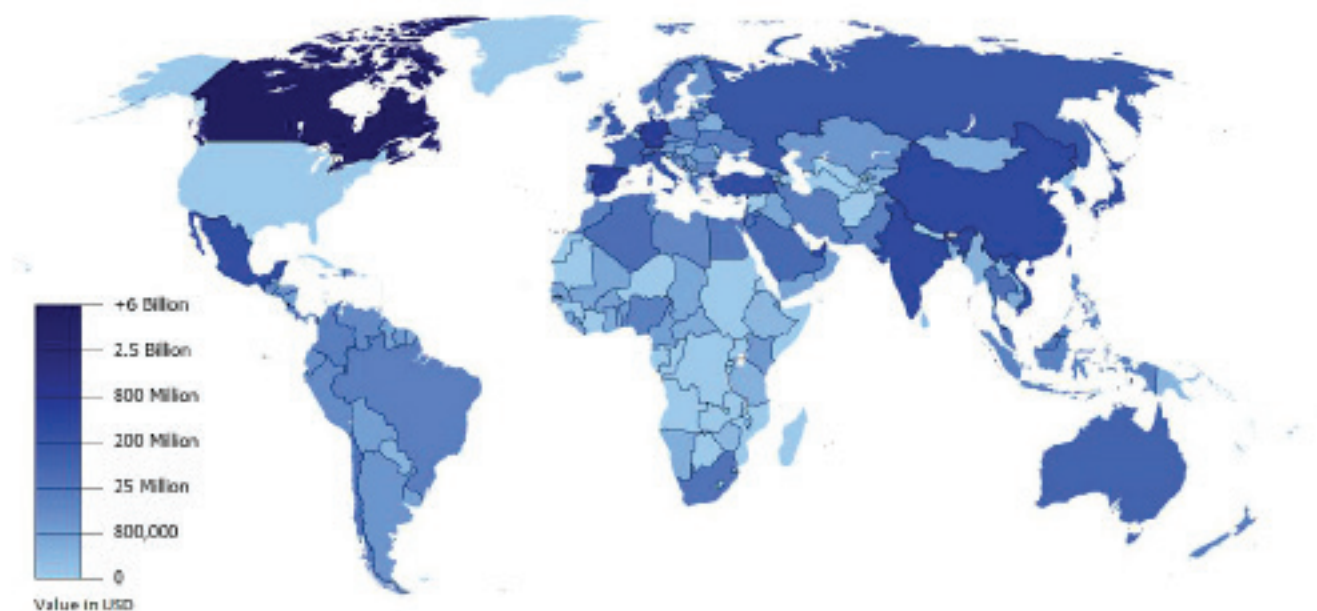
Organic production and other specialty designations such as functional foods and nutraceuticals represent alternative production methods and value-added market opportunities for specialty crop growers that may increase profitability. The 2015 USDA Dietary Guidelines which encourage higher consumption levels of fresh produce consumption coupled with increasing metabolic health issues facing American consumers motivate new farmers and experienced farmers looking for diversification opportunities to invest in alternative crops. The rapid increase of numbers of farmers' markets and Community Supported Agriculture (CSA) shares represent direct to consumer marketing avenues for specialty crops.

Volatile market prices and fluctuating supplies represent two major sources of risk facing specialty crop producers. Exposure to new regulatory risks is presented by the Food Safety Modernization Act and instability in political circles regarding use of migrant labor to harvest specialty crops and minimum wage laws. The impact of pending labor shortages in Mexico adds further concerns to specialty crop producers who rely heavily on hired farm labor to care for and harvest crops during short market windows. With nearly half of fruit and vegetable production occurring in the western United States, continued droughts and increasing population numbers drive concerns about limited access to water for agricultural uses.

Overall, producers need a better understanding of the availability of risk management resources, such as educational programs, market/consumer research, business/market plan development, and financial resources.

### Conclusions

In conclusion, there are specific gaps in knowledge and resources that may be provided by research and extension specialists. Specialty crop growers require updated, customizable enterprise budgets in template format specific to their regional growing conditions and production methods (irrigated, high tunnel, intensive). These simplistic yet powerful tools provide new and experience growers with information about the necessary components required to produce average yields and under varying market price



**Figure 2. Specialty Crops Trade By Country (USDA, 2013).**

Source: USDA/FAS Global Agricultural Trade System



expectations. With few exceptions, specialty crop operators need resources to improve technical knowledge about these crops and the market situation and opportunities available to them. Extension specialists receive daily requests from growers who need information on managing production risks, and, more importantly, seek a better understanding of market demand and price trends for these products. Specifically, the authors suggest development of a database of knowledge, by specialty crop type, that could be shared throughout the Southeastern region.

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# Working With Your Ag Lender in Good Times and Bad

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Credit and financing problems in the agricultural industry have been on the rise for the past couple of years. Struggles have developed at varying pace and intensity by region and commodity, some beginning as early as 2011. But across the board, by the 2016 growing season, the high levels of liquidity previously built are diminishing as commodity prices have generally fallen and margins have become extremely tight. To make matters worse, the outlook for most crop and livestock commodities remains dim. While some indicators point to stability (interest rates remain low and total farm debt-to-asset ratios remain low), the problem at hand is one of liquidity.

For 3-4 years, debt repayment has declined, loan demand is up, and total outstanding debt has been on the rise in many regions. Much of the trend is due to an inability to repay operating loans, and the need to carry or convert those shortages to longer term debt. Currently stable asset and collateral values can, in many cases, support outstanding and extending debt levels. However, the 1980's crisis taught the dangers of too much reliance on asset based lending. If you dig very far into commodity prices and costs of production, it becomes clear that repayment capacity, and therefore financing is headed for difficult times. In the back of everyone's mind is the potential for a decline in land and other farm asset values and the significant solvency issues that would follow.

None of this discussion is to spread gloom and doom, but to highlight during this time the importance of the borrower / lender relationship in agriculture. Tighter producer margins will stress farmers and ranchers to cash flow and stay current on debt payments. Increased demand for loan funds, reduced repayment capacity, and reduced loan security will stress lending institutions and regulators. Tension is sure to arise between borrower and lender. There is no doubt some borrowers will lose access to credit.

Ag producers and lenders alike must recognize that their individual success is inextricably tied to the success of the other. An unproductive attitude of isolating your own business interests can destroy necessary working relationships, eventually limiting your own success.

Whether times are difficult or the industry is soaring, the ones that continue to thrive and/or keep their head above water are the producers and their lenders that work together as partners.

## **Borrower / Lender Partnership**

The borrower/lender relationship can be a confusing one. In one sense the borrower is a customer needing to purchase credit from the bank. In another sense, the bank can be the customer, pursuing borrowers that they might "invest" in their business in order to secure a return on the bank deposits. Given that it works both ways, the best relationship is one that both consider a partnership. If the partnership is positive and productive, a lender can assist a producer in taking advantage of opportunities to push ahead during good times as well as surviving those inevitable downturns in the market. A good borrower/lender partnership consists of many of the same elements found in any good partnership. The following are some characteristics important to a borrower and lender working well together.

## ***Honesty and Full Disclosure***

Both parties need to be upfront and honest in their dealings. No one wants a partner that cannot be trusted. For the producer, full disclosure means sharing all the details of operating plans. Typical financial statement information is a given, but a producer also needs to disclose less obvious components such as outside partnerships, agreements, or contractual obligations. Any new business ventures, obtaining credit from other sources, significant capital purchases, or sales should also be discussed. A producer should allow and even encourage their lender to see their operation first hand.

A similar level of disclosure should be expected of the lender. While there may be situations that would legally prevent a bank from disclosing some information, a lender should openly help their borrowers understand the business and incentives that keep the bank profitable and a stable

source of credit. Lenders should openly discuss issues of credit scoring, borrower ratings, timing of decisions and avoid making unrealistic commitments.

### **Communication**

A solid borrower/lender partnership will include a continual communication. Too often producers see borrowing as a single event where if all goes as planned and you continue to make payments on time, you don't need to talk to the bank again. While that may be true of your car loan or home mortgage, any business loan is much more involved. Even when things are going according to plan, periodically checking in with your lender is time well spent. It reinforces the concept of a partnership, and it can't hurt to make sure things are going according to plan with the bank. Most importantly, the partnership is supported when you make sure to have positive conversations. You don't want the only time you talk to be when something went wrong or when a problem needs to be solved.

It's important to remember that effective communication is not simply an ongoing conversation. Both parties must be prepared to hear and account for the advice, knowledge, and expertise the other party brings to the table. During periods of financial stress or hardship, lenders may recommend "belt tightening" measures adjusting current production practices or living expenditures. If this sound advice is ignored, it can be detrimental both businesses. At the same time, the producer may explain that certain practices or costs of production cannot be adjusted without risking the entire operating plan. Likewise, if the farmer's sound production knowledge is ignored, it can be detrimental to both businesses. Effective communication requires the active compromise of ideas toward a solution. While these type of give and take conversations may be difficult, they are critical to staying away from significant losses that both borrower and lender hope to avoid.

### **Proactivity**

A producer should develop management plans and particularly financing plans well in advance. The casual "just checking in" conversations can be used to bring up potential plans and things a producer is considering. The lender's opinion should be sought regarding strategic changes well before time to obtain financing. In fact, more than just opinions, it is often best if plans and strategies are developed through coordination with the lender, taking advantage of his expertise. These actions help the lender understand the manager is one that thinks things through, and when it does come time for financing, the lender will

know that plans have been thoroughly evaluated. Contrast the proactive borrower with one that springs new ideas on the lender at the last minute and expects the bank to make quick turnaround decision on a loan. Which borrower is a more attractive partner to the lender?

### **Trustworthiness**

A critical key to any partnership is two parties that have a trust in one another. While the capital purchase plans and operating plans upon which a loan is based are not necessarily full contractual obligations, there is an expectation that both will stick to the plans. A lender is not interested in working with a borrower that routinely makes drastic departures from his original cash flow budget that impact his repayment capacity. By the same token, a producer would not want to work with a lender that changed his access to an agreed operating line of credit halfway through the growing season.

### **Knowing and Communicating Your Business**

In addition to the characteristics above, one of the things that makes an attractive borrower is the extent to which he knows his own business. It is an indication that a producer is and will be making sound financial decisions that in turn limit risk on the part of the lender. The beginning of that for most lenders is looking for a borrower that has a good understanding of his own financial statements. Too often, these documents either don't exist or they exist because the loan officer creates them. More appropriate is the borrower that can communicate the story of his operation through historical financial statements and *pro forma* estimates of future plans. A sound cash flow budget effectively communicates an operating plan, the timing associated with accessing an operating line of credit, and estimates of repayment capacity. A complete and accurate balance sheet illustrates your overall solvency position, other debt obligations, and current liquidity position. Several years of recent income statements will demonstrate a track record of performance for an operation. Each of these financial statements should be updated frequently as a standard management practice to monitor a business, but it is also important to share updates with the lender indicating progress or deviation from an original plan.

It is often the case in the current agricultural lending environment that while the lender may be financially or business savvy, he/she may not have an agricultural background, or be well versed in an agricultural producer's enterprise. This is especially true for less common commercial agricultural enterprises such as horticultural

crops and niche livestock operations. Therefore, in addition to providing a financial understanding, it is incumbent on the borrower to educate the lender on enterprise specific production practices. It is essential that the lender comprehend technical elements of the operation beyond the simple dollar totals tied to loans and loan repayment.

In line with the earlier discussion of being proactive, a necessary part of having a solid grasp on a business is planning ahead for credit needs. Planning appropriately for credit needs means having a constant eye on the future and having realistic financial and operating expectations. Overly optimistic commodity prices, crop yields, or undervalued costs of production may look good on paper at the beginning of the season. However, poor credit planning will usually lead to a position of insufficient credit availability and a strained partnership with the lender. A producer that consistently makes credit plans that do not need to be adjusted is the customer the bank is most interested in keeping. Planning for credit needs also means simply keeping surprises to a minimum. Capital purchases or third party debt shouldn't be made without some discussion with the primary lender. When plans begin to fall apart, getting the lender involved as soon as possible will demonstrate that the borrower is on top of the situation, as well as allowing time for the lender to help plan a solution.

A major concern for agricultural producers and lenders alike are risk management strategies and tools available to producers. These tools have become even more critical since the passage of the 2014 Farm Bill and the elimination of direct payments. Previously, operating credit lines were made more secure with the certain revenue of fixed direct payments. Without direct payments, crop insurance and price risk management have become more critical from a lender's perspective. However, the many crop insurance and marketing choices available can be an area of contention between borrowers and lenders. For example, the level of crop insurance a farmer buys is determined by a balance between premium cost and risk tolerance. In some situations, an operating loan may be made contingent on the producer buying specific levels of coverage in order to ensure repayment capacity. From the farmer's perspective, higher premiums may cut too deeply into profits and he would prefer to take the risk the banker is not willing to take. Of course the lender would like to see coverage levels approaching a guarantee on at least the operating line of credit extended for the crop. The lender interest in crop insurance choice can vary from suggestion to requirement, depending on the financial condition of the borrower and relative strength of the borrower/lender partnership.

Marketing opportunities and price risk management can also be a source of friction between borrower and lender. Once again, managing the balance between producer and lender profit/risk motives requires a proactive plan that both parties understand and are willing to follow through. Bankers often express frustration with producers when they fail to take action to lock in an available price that would accomplish their operating cash flow plan. Conversely, some elaborate pricing tools can leave a lender wary, especially if they do not understand the tools. If a specific plan involves credit needs for upfront premium costs or potential margin calls, it is critical to have a lender that understands and is willing to commit to the financing necessary to carry out the plan under a variety of possible outcomes.

A bigger picture, long-term strategy is also critical for a successful credit partnership. Experience in agricultural production reminds us that everything comes in cycles. Short sighted optimism can be a problem for both borrower and lender. During market highs, some people will assume the industry has reached and will sustain a new plateau. Producers and lenders alike may be willing to over extend credit based on solid collateral values and repayment capacities. Similar conditions in the 1970's certainly contributed to the 1980's credit crisis. It is important to use the more profitable peaks of the cycle to first repair and strengthen one's financial condition in preparation for the next downturn. During times of depressed prices or challenging weather, operating shortfalls or unmet debt obligations may be extended into term debt to help a producer manage the cycle lows. Throughout the ups and downs of industry cycles, it is critical that borrower and lender work together toward a common long term strategy.

### **Understand the Bank Business**

As with any partnership, it's important to put yourself in the other's shoes and understand their business incentives. A bank's profit motives, incentive structure, rules, and regulations will all impact the credit decisions critical to a farmer's continued success. Every detail of a bank's financial condition may not be necessary or even available, but a borrower should ask questions and be relatively familiar with the stability and strength of the bank. In addition to the condition of the bank, it may also be important to understand the bank's portfolio of deposits and lending business. For example, if a bank is well diversified, lending to a variety of industries and/or a variety of agricultural commodity production, it may be less likely to panic when one industry or commodity

market is going through a downturn. At the same time, a producer would want his lender to have enough investment to demonstrate a commitment to his industry.

In addition to knowing the condition of the bank, a borrower should fully understand the process by which the bank makes lending decisions. Answers to the following questions will give the borrower an appropriate working knowledge of the loan process:

- Who are the key players in a loan decision?
- What is the role of the loan officer, credit analyst, and others?
- Is there a loan approval board? Who makes the final lending decision?
- How does the size or type of loan affect the approval process?
- How long will various types of loan decisions take?
- How are rates determined for different term, size, and types of loans?
- Under what circumstances might a loan be called?
- How do bankruptcy, homestead protection, and other borrower protection laws affect a loan?
- How do regulatory oversight and bank examination standards affect a loan?

A good lending partner should be as comfortable answering these types of questions as they are asking questions regarding the borrower's business.

When it comes to understanding your lender's business, another important factor to remember is that the bank's willingness to loan funds does not always mean it is a loan you should take. There may be times where the risk and terms of a loan make it a good business decision for the bank, but not the best business decision for the borrower. The final decision on whether to borrow or not rests within what the producer believes to be his/her best interests and it is the producer's responsibility to financially vet those decisions.

In the end, the strength of the borrower / lender relationship is critical to both parties. A good borrower must first be a good manager of his own business and then be able to effectively communicate his business plans to the lender. Likewise, a good lender must also first be a good manager of his own business. He then must be able to help the borrower navigate and understand the lending process while committing himself to understanding the industry and production practices of his borrower. Both must have open lines of communication. They must think proactively together as partners and be able to trust and depend on one another for the benefit of both businesses.



# Crop Insurance: Basic Producer Considerations

Aaron Smith, Joe L. Outlaw, and Robert A. Tufts

## Introduction

Annual crop insurance decisions can assist producers in mitigating production, revenue, and financial risk. All crop insurance policies have similar elements however this article focuses on crop insurance as it relates to the coverage of traditional row crops (corn, cotton, soybeans, and wheat). Specifically, this article provides a brief background of crop insurance, discusses producer risks that can be partially mitigated by crop insurance, explains how coverage and indemnities are calculated, and discusses producer considerations when selecting a crop insurance policy. A second article, *Crop Insurance: Specific Considerations*, provides further considerations for producers with respect to lender and producer financial risk, prevented planting, and interactions with price cycles and commodity programs (Agriculture Risk Coverage - County Coverage (ARC-County) and Price Loss Coverage (PLC)).

## Background

In 2015, crop insurance policies covered over 100 commodities, 366 million acres, and \$102 billion in

liability. Crop insurance has been available since the 1930s, however producer adoption did not expand rapidly until the early 1990s. Over the past 25 years crop insurance has evolved from being a sparsely used novelty to an essential risk management tool. Since the early 1990s, there have been many crop insurance policies available to producers, Since 1997, producers have expanded the use of federal crop insurance and adopted revenue policies at the expense of yield policies (Figure 1). In 2015, revenue protection policies accounted for 91.7% - 183 million acres and yield protection 6% - 11.9 million acres of total insured acres of corn, cotton, soybeans, and wheat. By comparison in 1997, yield policies insured 75% - 74.8 million acres and revenue policies 24% - 23.4 million acres.

Many factors have contributed to the increased use of crop insurance, particularly revenue based products. First and foremost has been the increased financial outlays generated and required to produce a crop. For example, in 1997 an acre of corn was estimated to generate \$327.60 of gross revenue and cost \$363.73 to produce (\$162.25 variable cost plus \$201.48 in fixed cost). In 2015, that same acre of corn was estimated to generate \$612.62 in

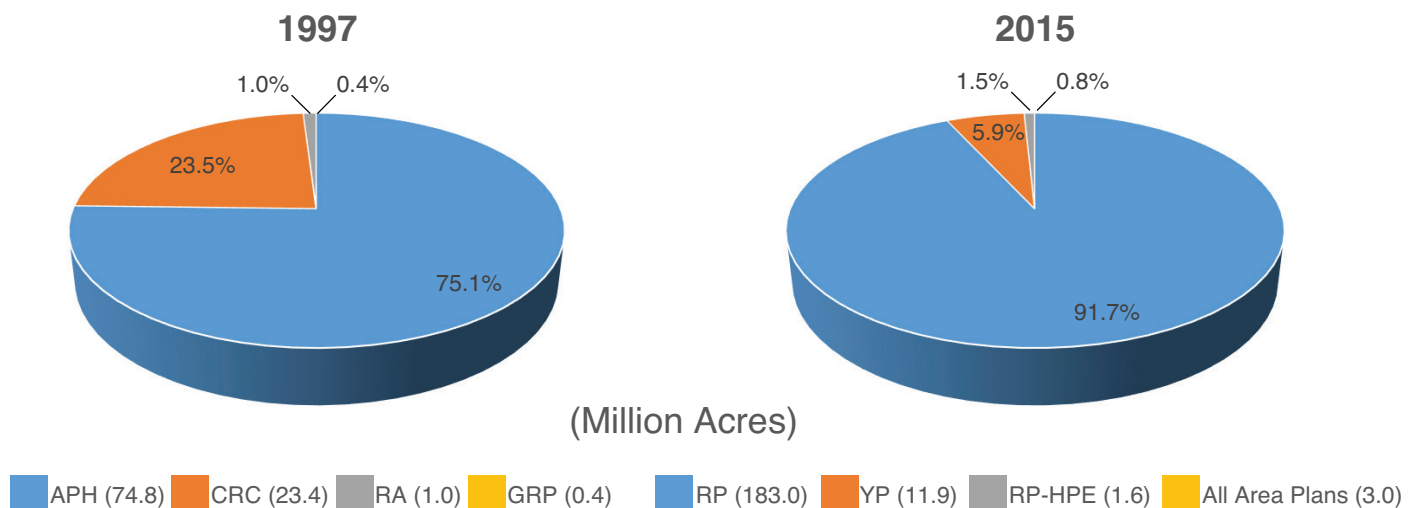


Figure 1. Crop insurance Policies by Type for Corn, Cotton, Soybeans, and Wheat, 1997 and 2015.



gross revenue and cost \$676.60 (\$334.69 in variable costs and \$341.91 in fixed costs) to produce, equating to an 85% increase in revenue and 86% increase in total cost (106% increase in variable cost and a 70% increase in fixed costs). Over the same time period estimated yield per acre increased from 130 bu/acre to 167 bu/acre, a 28% increase. As such, without considering other factors (yield variability, weather volatility etc.), the effectiveness of yield protection crop insurance policies as a risk management tool has been diminished relative to revenue protection.

### Producer Risks

Crop insurance is designed to assist producers in managing risk during the production year. As such, prior to evaluating crop insurance products and features producers should ask: What risk (s) can be mitigated with crop insurance? Risks that can be partially mitigated with crop insurance policies include: production, revenue, and financial.

- **Production risk** involves the uncertain natural growth process of crops (variability in yield and quality). Weather, disease, pests, and other factors can affect the quality and quantity of production. As such, producers should determine their production regions susceptibility to drought, flood, hail etc. when choosing a crop insurance policy.
- **Revenue risk** refers to the uncertainty in revenue (yield and price) producers receive for their commodities. In general, revenue risk, from the perspective of crop insurance can be identified as deciding to plant a crop with the expectation of one price or revenue level and harvesting at another. Volatility in prices and revenue during the production year can dramatically alter producer profitability. For primary row crops futures markets are used to determine crop insurance prices. As such, producers should fully consider the impact of local basis on the net revenue they are expected to receive for their commodity. In general, counties with a negative basis are able to mitigate more revenue risk with crop insurance than counties with a positive basis.
- **Financial risk** occurs when the producer borrows money and creates an obligation to repay debt in order to produce a crop. Financial risk associated with repayment of loans and other financial obligations is unique in that risk is also born by an additional entity – the agricultural lender.

Agricultural lenders provide capital to producers to plant, grow, and harvest a crop, thus, from the perspective of a lender crop insurance can be viewed as a source of repayment and collateral for debts.

### Calculating Guarantees and Indemnities

For yield and revenue crop insurance policies yield, price, and coverage level are required to determine the revenue or yield guarantee and indemnity payment. A producer's yield history is used to determine the Actual Production History (APH) yield. A producers APH is determined by 4-10 years of yield data for each insured unit (see unit structure below). To prove yields producers can use sales receipts, storage records, and feed consumption records. For corn, soybeans, and wheat, crop insurance price is determined from the Chicago Mercantile Exchange (CME), for cotton price is determined from the Intercontinental Exchange (ICE). The simple average closing price of the harvest futures contract over the price discovery period (one month) is used to set the crop insurance price for each commodity. Price discovery periods vary by commodity and region.

The revenue or yield guarantee sets the amount a producer is indemnified. The simple calculations are:

$$\text{Revenue guarantee} = \text{APH} \times \text{coverage level} \times \text{price};$$

and

$$\text{Yield guarantee} = \text{APH} \times \text{coverage level}.$$

For example, a soybean producer with an APH yield of 45 bu/acre, projected price of \$8.85/bu, and buy-up of 75% coverage would have a revenue guarantee of \$298.69/acre. If that same producer instead decided to purchase a yield protection policy, at the same buy-up level, coverage would be estimated at 34 bu/acre (45 bu/acre x 75% buy-up). For revenue policies, the spring revenue guarantee can be revised up if the fall price (price determined at harvest using the same method as the spring price) is higher than the spring price. If the fall price is higher than the spring price the revenue guarantee would be established at the higher coverage level. If the harvest price is lower than the spring price then the revenue grantee would remain at the established spring guarantee.

For an indemnity to be paid from revenue insurance actual revenue must fall below the revenue guarantee. For the example above, revenue would have to fall below \$298.69/acre for an indemnity to be paid. An indemnity

could occur from decreased yield, decreased price, or a change in both which results in revenue dropping below the guarantee (*i.e.* a price decrease could be offset with a yield increase causing revenue to remain above the guarantee). An indemnity trigger for yield protection occurs if actual yield falls below the yield guarantee. Price will not trigger an indemnity payment under a yield insurance policy. However, price will determine the amount of the indemnity the producer receives. In the above example, if yield is equal or above 34 bu/acre no indemnity is paid if it is below 34 bu/acre an indemnity is paid ([guaranteed yield-actual yield] x price).

### **Producer Considerations when Selecting a Crop Insurance Policy**

Given the risks associated with row-crop production it is imperative for producers to seek professional advice when making production and financial decisions. Using a qualified professional crop insurance agent is strongly encouraged as they will help producers select the appropriate coverage to mitigate their risks. For producers, it is important to identify the risks crop insurance policies can mitigate for each field and commodity being grown. Selecting the appropriate crop insurance policy depends on the commodity, region, production method, and financial resources available to the farming operation. After identifying the relevant risk, a producer must then evaluate the different crop insurance policy options. For all crop insurance policies it is important to determine: i) the type of insurance plan; ii) production practices; iii) yield exclusion opportunities; iv) unit structure; v) coverage level; and vi) premium cost.

#### **i) Type of Insurance Plan**

In general, crop insurance policies can be divided into two categories - yield and revenue. Yield policies provide protection during the production season against yield losses from forces outside the producer's control, such as drought or flood. Revenue policies provide coverage against decreases in revenue (price and yield combinations) during the growing season. Crop insurance policies can be further segmented into individual or group policies. Individual policies provide coverage for individual farms or farms managed by one producer - determined by the type of policy and the unit structures available to the farm operation. Group policies provide protection against area wide losses (*i.e.* a county or other specified geographic area) and are

not generally attached to production from one specific producer.

#### **Producer considerations:**

- **Is yield coverage sufficient to mitigate risk or should revenue protection be purchased?**

Individual financial circumstances and risk preferences will guide producers in determining if yield or revenue coverage will meet their needs. Additionally, talking with your lender about revenue versus yield coverage is encouraged. Consideration should be paid to differences in premium cost.

- **Does drought or frequent flooding occur on the farm?**

Fields within a county have different risk profiles. Low lying river bottoms will be at risk of flooding while sandy hill tops present a greater risk of drought. Location within the region, state, or county will influence the crop insurance coverage selected.

- **Does my marketing program provide adequate price/revenue risk protection?**

Crop insurance should be supportive to your farm's marketing program. Avoid doubling up costs by having marketing strategies covering the same risk as crop insurance. The goal should be to achieve a specified level of revenue coverage for a minimum cost.

- **Are individual yields correlated to county yields?**

If individual farm yields are strongly correlated with county yields producers may want to consider an area insurance plan that may have cheaper premiums. If individual yields are not correlated with county yields the effectiveness of an area plan will be diminished.

#### **ii) Production Practices**

Production practices can influence the crop insurance policy decision for producers. Irrigated vs non-irrigated and conventional vs organic are

two examples of production practices that can differentiate the insurance product that best suits your operation. For example, the risks a producer with irrigation face are very different than those without access to irrigation. Production practice will also determine buy-up level, unit structure, and premium cost.

***Producer considerations:***

- **What production practices are insurable in my county?**

Not all production practices are insurable in every county. Contact your crop insurance representative to determine which practices can be insured separately.

- **Is irrigation available to offset yield risk?**

Access to irrigation allows producers to reduce yield risk. Using marketing alternatives, such as options, may be more cost effective in some circumstances than purchasing revenue protection crop insurance.

- **Can private contracts or marketing orders offset price/revenue risk?**

Evaluate opportunities to mitigate risk outside of federal crop insurance, particularly for specialized production practices like organic and non-GMO. Laying off risk to other entities in the supply chain may be a cost effective solution.

**iii) Yield Exclusion Opportunities**

The APH yield exclusion allows producers to exclude the yield for a commodity if the simple average county yield falls below 50% of average yield for the previous ten production years. Producers in adjacent counties will also have the ability to drop the yield from their APH calculation. By excluding abnormally low yields producers can increase their APH and/or revenue guarantee.

***Producer considerations:***

- **Are my farms/commodities eligible for yield exclusion?**

Increasing APH raises the coverage (\$/acre or bu/acre) for each buy-up level of crop insurance. Producers should determine which years/commodities are eligible for yield exclusion in their county.

- **Can I get the same coverage through yield exclusion as buying-up additional coverage?**

In most circumstances using the yield exclusion will be in the producer's best interest. Yield exclusion can result in increased coverage buy-up for the same premium cost or reduce premium cost for the same coverage buy-up.

**iv) Unit Structure**

Each parcel of land that is insured independently of other parcels is defined as a unit. Separate production records must be maintained for each unit. The unit structure determines the coverage, premium paid, premium subsidy, and indemnity trigger for the crop insurance policy. The four unit structures are basic, optional, enterprise, and whole-farm. Basic units can be designated for all tracts of land and commodity that a producer owns, cash rents, or share rents with a different land owner in a county. Optional units may be designated when i) basic units occur in different township sections or ii) a crop is being grown under different production practices (irrigated vs non-irrigated). Enterprise units combine all acres of a single crop within a county in which the policyholder has a financial interest into a single unit, regardless of whether they are owned or rented, or how many landlords are involved. A whole farm unit combines all acres into one unit. Unit structure options available to producers will vary by region and commodity.

***Producer considerations:***

- **What is the difference in premium subsidization for different unit structures?**

Unit structures and buy-ups receive different premium subsidization from the federal government (Table 1). Tradeoffs between coverage and premium cost should be fully understood.

- **Are the yields and risks for individual land parcels correlated?**

**Table 1. Percent of Premium Covered by Government Subsidy for Coverage Levels, Crop Insurance Product, and Unit Structure.**

Coverage Level/ Buy-up (%)	Percent of Premium Paid by Federal Government				
	<i>Basic &amp; Optional</i> (%)	<i>Enterprise</i> (%)	<i>Whole Farm Unit</i> (%)	<i>SCO Subsidy</i> (%)	<i>STAX Subsidy</i> (%)
50	67	80	80	65	NA
55	64	80	80	65	NA
60	64	80	80	65	NA
65	59	80	80	65	NA
70	59	80	80	65	80
75	55	77	80	65	80
80	48	68	71	65	80
85	38	53	56	65	80
86	NA	NA	NA	65	80
90	NA	NA	NA	NA	80

Similar to group insurance policies, the effectiveness of the insurance coverage provided by unit structure is dependent on the correlation between yields and risks faced by each land parcel.

#### v) Coverage Level

Catastrophic risk protection endorsement (CAT) provides a minimum level of coverage. Where available, CAT coverage insures 50% of the approved yield and 55% of the price for a commodity. For CAT coverage, the premium is paid by the Federal Government; however producers are still required to pay an administrative fee of \$300 for each crop insured in each county. For RP, RP-HPE, and YP policies producers can choose to buy-up coverage from 55% to a maximum of 85% of yield (not available for all commodities or locations) and 100% of price. Since the early 1990s, producers have increased their average coverage level for corn, cotton, soybeans, and wheat (Figures 2-5).

#### *Producer considerations:*

- **What are my risk preferences?**

Producers are comfortable with different levels of risk exposure. Risk adverse producers will buy-up greater coverage while risk neutral producers may buy-up lower coverage.

- **Does the operation have sufficient cash reserves to withstand deep losses?**

An operations ability to absorb losses should be strongly considered when selecting a coverage level. Operations with lower working capital may want to secure greater buy-up coverage to avoid a deep loss that may force them to exit the industry. Operations with large cash reserves may be inclined to purchase lower coverage levels at lower premiums thus self-insuring over time.

- **How does this affect my ability to borrow?**

Maintaining a mutually beneficial relationship with your lender is imperative in agriculture. An open and honest dialogue will provide an indication of your lenders borrowing requirements and assist in obtaining the financing to plant, grow, and harvest your crops.

#### vi) Premium Cost

Type of insurance, production practice, unit structure, and coverage level will all contribute in determining the premium paid for crop insurance policies. Table 1 shows the premium subsidy (percent of total premium paid by the federal government) for different buy-up levels, unit structures, and crop insurance products. Producers can obtain premium estimates from approved insurance providers (AIP) in their county or the USDA-RMA's Crop Insurance Decision Tool available on line at: <http://prodwebnblb.rma.usda.gov/apps/CIDT/>. Premium costs will move in the same direction as the commodity's price (*i.e.* when

wheat prices are rising premium costs are increasing and vice versa).

#### ***Producer considerations:***

- **How much should I pay for crop insurance?**

Minimizing cost subject to a predetermined level of production should be the producer's goal. Stepping through the considerations above will often lead to a satisfactory premium. Lowest cost does not equal best value. Efficiency of coverage should be the goal.

- **What is the most effective way to lower premium costs while maintaining sufficient coverage?**

Yield exclusion is likely the most cost effective avenue but buy-up coverage and type of insurance plan should also be fully explored. A good crop insurance agent will be able to provide multiple scenarios for cost comparison.

#### **Conclusions**

Crop insurance has become a vital risk management tool for row crop producers across the United States. Recently row crop producers have favored revenue products with higher buy-up levels over yield products and lower buy-up levels. When producers are selecting

their crop insurance products they should determine the risks they are attempting to mitigate and consider the type of insurance plan, production practices utilized, yield exclusion options, unit structure that suits their operation, coverage level, and premium cost/subsidization.

Choosing a suitable crop insurance policy can be a complicated process with many variables to consider. Additionally, the best crop insurance policy is dependent on the purchaser's unique circumstances, as such producers are cautioned to avoid taking a one size fits all approach to crop insurance policy selection. Seeking advice from qualified crop insurance professionals will help simplify the process and help the purchaser avoid common pitfalls.

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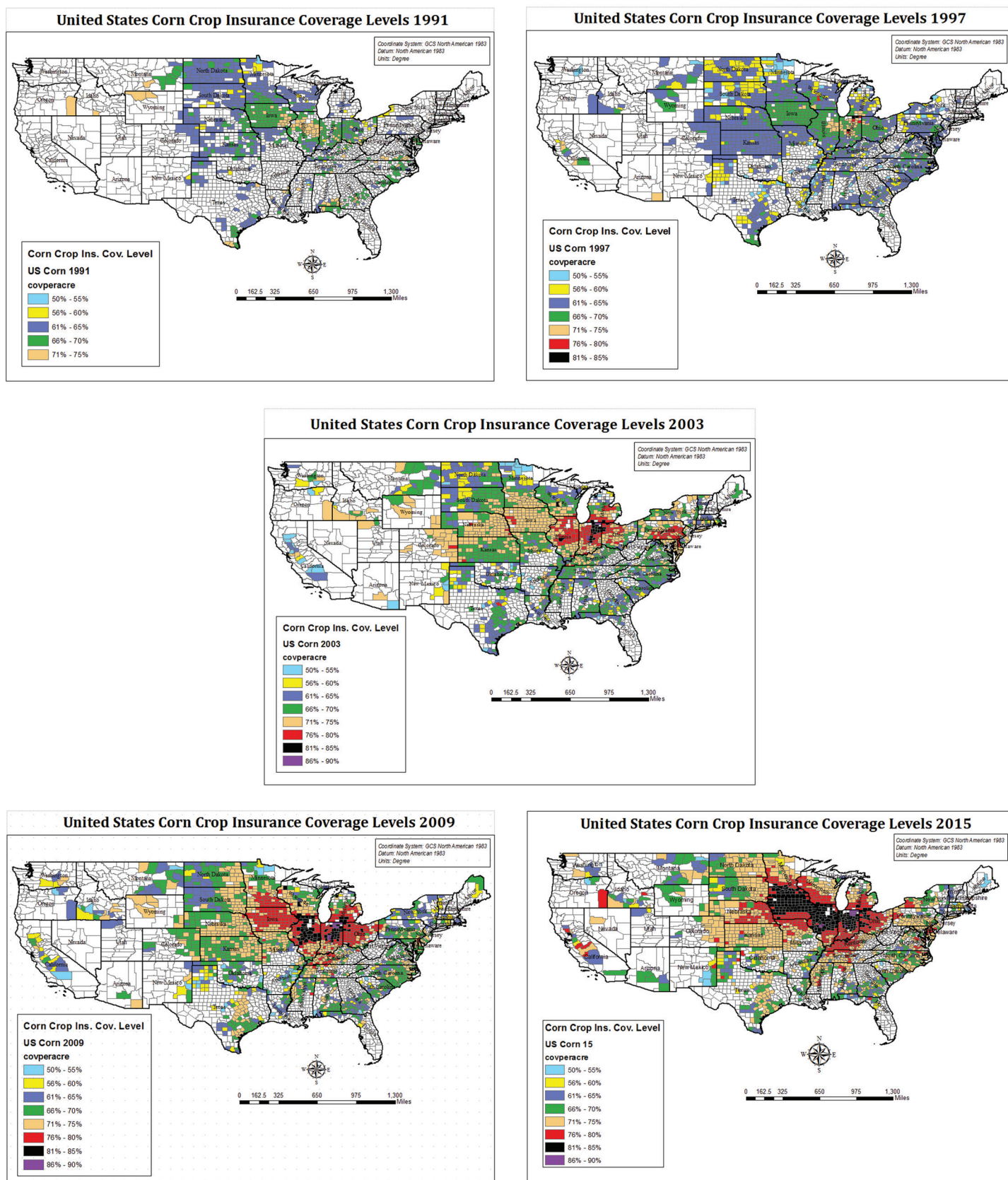


Figure 2. Corn Crop insurance Buy-up Levels the Year After a Farm Bill (1991, 1997, 2003, 2009, and 2015).



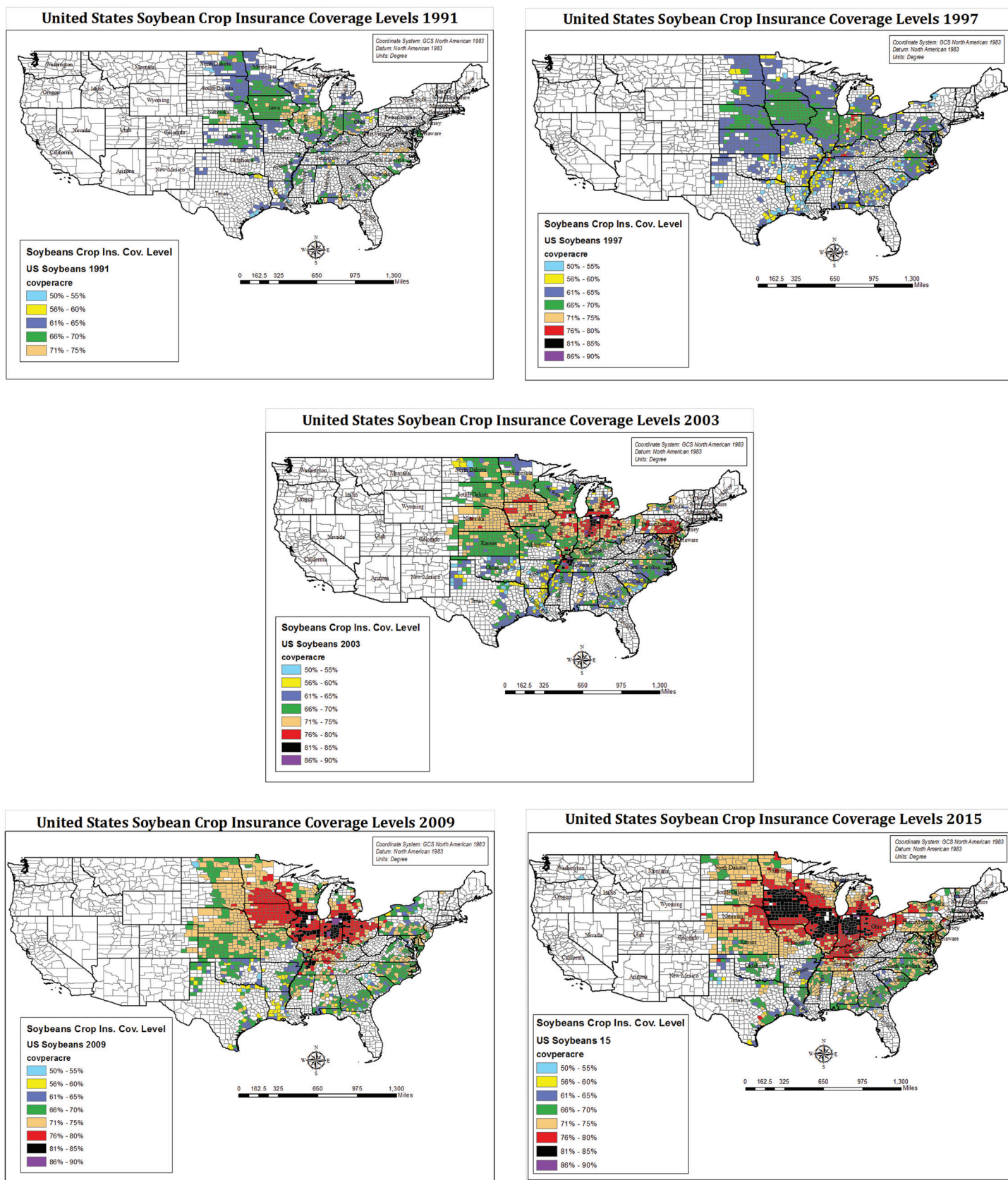


Figure 3. Soybean Crop insurance Buy-up Levels the Year After a Farm Bill (1991, 1997, 2003, 2009, and 2015).

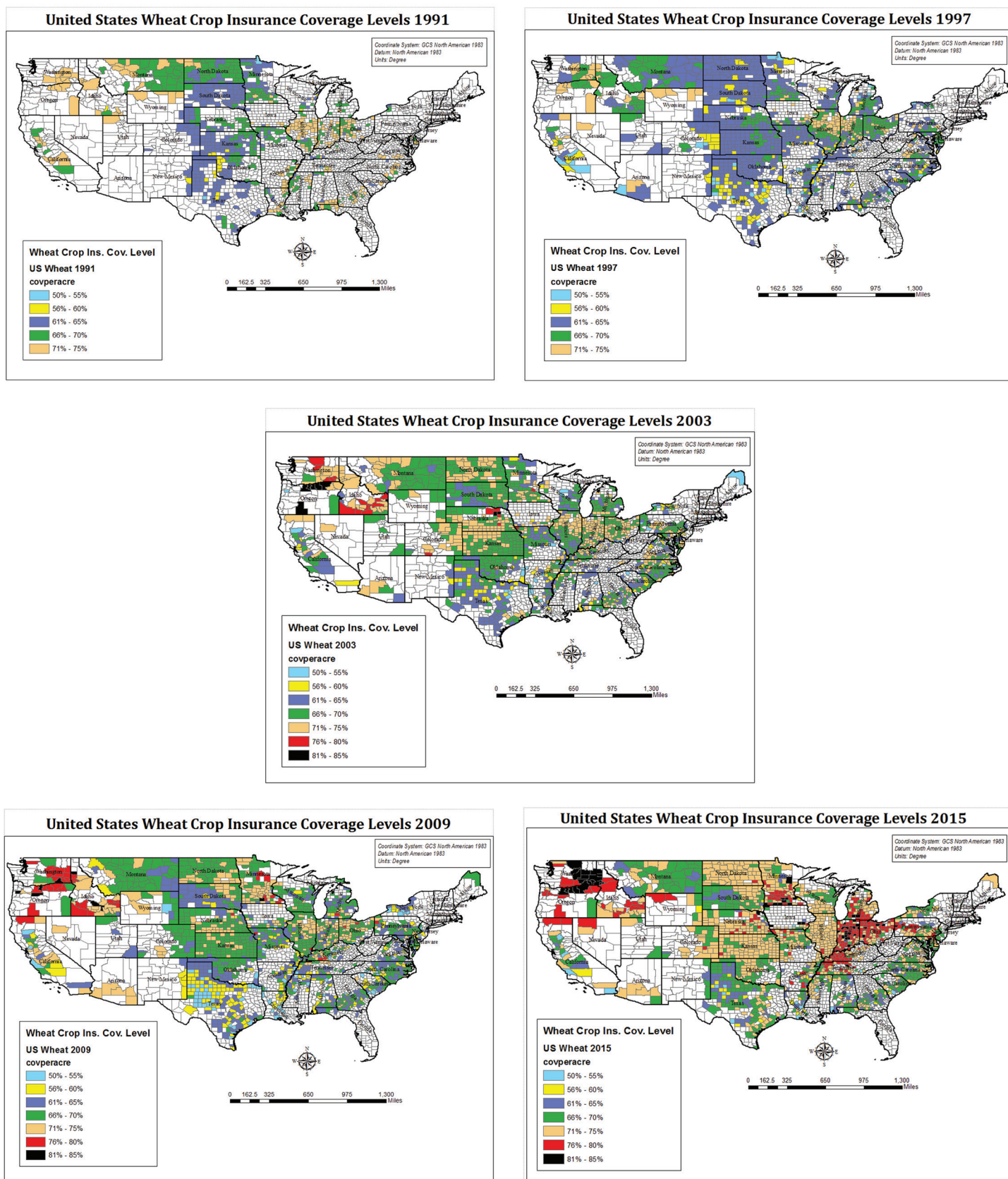


Figure 4. Wheat Crop insurance Buy-up Levels the Year After a Farm Bill (1991, 1997, 2003, 2009, and 2015).



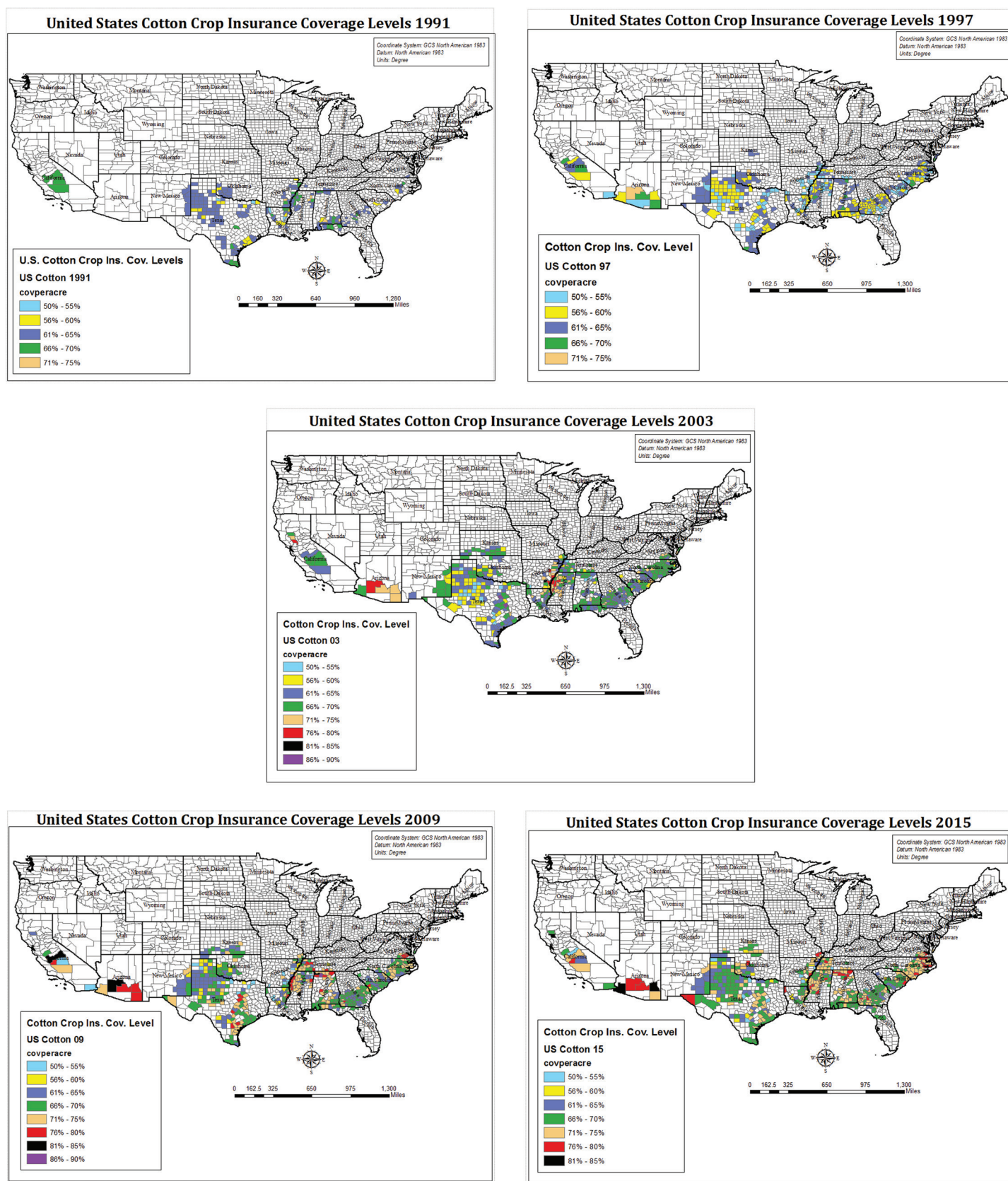


Figure 5. Cotton Crop insurance Buy-up Levels the Year After a Farm Bill (1991, 1997, 2003, 2009, and 2015).

# Labor Issues

Luis A. Ribera, Samuel D. Zapata, and Derek Farnsworth

Many agricultural producers are currently facing increasing costs and decreasing revenues. The outlook for US agriculture looks gloomy with low row crop prices across the board, along with decreased government support and increased competition overseas. Some row crop producers might be looking at alternative crops that are not experiencing low prices to add to their crop mix. However, some of these alternatives (*e.g.*, organic crops and vegetables) might be labor intensive, requiring special considerations. This article focuses on a primary farm expense that has substantially increased in recent years, labor. Historically, an adequate supply of labor, especially during planting and harvest, has been the primary constraining factor for agricultural producers. With the recent dramatic increases in farm wages, a concern has risen regarding whether many labor-intensive crops can still be profitably produced.

Human resources are both a source of risk and an important part of the strategy for dealing with production risk (RMA, 1997). Managing labor is the main source of this type of risk. Hired farmworkers include field crop workers, nursery workers, livestock workers, farmworker supervisors, and hired farm managers (ERS, 2012). Hired farmworkers make up less than 1% of all US wage and salary workers, but they play an essential role in US agriculture. Wages, salaries, and contract labor expenses represent roughly 17% of total variable farm costs, and as much as 40% of costs in labor intensive crops such as fruits, vegetables, and nursery products. Hired farmworkers continue to be one of the most economically disadvantaged groups in the United States.

The average number of hired farmworkers has steadily declined over the last century, from roughly 3.4 million to just over 1 million (ERS, 2012). The 2010 Population Survey estimates that in 2010, 57.2% of the agricultural hired labor force was foreign-born (US Census Bureau, 2012). Approximately 62% of those foreign employees worked in crop production, while the remainder worked in livestock. How these workers are managed is also changing. Farm labor contractors now play an essential and growing role in the acquisition and allocation of farm labor.

There are several myths or misconceptions regarding the economic nature of agriculture and the farm labor

workforce. These misconceptions can substantially mislead the understanding of the issues and availability of farm labor (Ribera and Knutson, 2013). These myths or misconceptions are: 1) farm labor should be readily available from non-farm sources, particularly in a time of high unemployment; therefore, no farm labor shortage exist; 2) only large agribusiness firms employ most of the farm labor; 3) farm laborers are paid the minimum wage and raising the minimum wage rate will solve the current farm labor shortage; 4) the labor market is national in scope and not local; and 5) producers are in a market position that allows them to simply pass on the cost of farming to buyers of their production.

These five misconceptions were discussed thoroughly in Ribera and Knutson (2013) and shown why they do not hold ground. In fact, two recent survey reports by NASS (2015) and Adcock *et al.* (2015) showed that the average wage paid to farm workers is \$12.27 and \$11.54 per hour, respectively. Similarly, the hourly wage of guest workers hired through the H-2A program ranges from \$10.59 to \$13.80, not including transportation, housing, and administrative costs. All of these hourly wage rates are much higher than the federal minimum wage of \$7.25 per hour. Further, farm labor shortage reports are all over the news, suggesting that there are other factors besides wages that also limit the availability of agricultural workers.

Given that most of the farm workforce is foreign-born and that even at much higher wages than the minimum wage US-born workers are not interested in working at the farm, there is a large push for an immigration policy reform. There is widespread agreement that current US immigration policy is “broken” and in need of repair. The uniqueness of agriculture must be considered in making these repairs. For example, the current H-2A farm labor program is not responsive to the short-term labor needs of produce farmers. In addition, given that animal agriculture is not seasonal, most livestock producers don’t have access to the H-2A program. Unless a new short-term visa program is created, proposals requiring that farmers e-verify will make the farm labor shortage problem worse. Therefore, agricultural producers’ organizations, commodity associations, and lobbying groups, among others support an agricultural labor reform as part of the

US Agriculture and Immigration Policy, mainly to secure the availability of farm labor, which for the most part is foreign-born. However, is legalization of foreign-born workers the solution?

Legalization of illegal immigrants may be a good idea in terms of increasing the supply of farm workers, but it does not ensure a long-term solution to the problem. Legalization increases workers' economic options in the United States, and this makes farm workers more mobile (Charlton and Taylor, 2013). Farm work traditionally has been a first stop for new immigrants, who move on to non-farm jobs when they are able. Legalization under the Special Agricultural Worker program in the 1987 Immigration Reform and Control Act stimulated the movement of immigrant workers out of farm work.

A greater issue than whether the proposed US Agriculture and Immigration Policy reform would fix the shortage of farm labor is the declining trend in the farm labor supply from households in rural Mexico, which are the main source of hired labor for US agriculture. Mexico's farm workforce fell nearly two million workers, 25%, between 1995 and 2010 (Taylor *et al.*, 2012). Main reasons for the decline are the sharp decline in the Mexican fertility rate, a significant expansion in rural education, and an increase in per-capita income, which now exceeds \$15,000 per year (adjusted for the cost of living). The good news for US farmers is that there is a great deal of persistence in farm work: if a rural Mexican does farm work one year, there is more than a 90% likelihood that he or she will do farm work the following year (Charlton and Taylor, 2013). The bad news is that a transition away from farm work is underway. The supply of agricultural workers will not disappear immediately, but US agriculture can expect to see a gradual decline in the availability of Mexican farm workers over time.

Moreover, productivity per farm worker in Mexico tripled, and after a decade of decline, employment on Mexico's fruit, vegetable, and horticultural farms is on the rise (Charlton and Taylor, 2013). In other words, United States and Mexican farmers are competing for a dwindling supply of farm workers. Farm workers in the United States are paid more than in Mexico, but if you add the cost and risk of illegally migrating to the United States, such as traveling long distances, paying a *coyote* (human smuggler), tighter border enforcement, and drug related violence along the border, the potential higher wages might not be enough; especially if Mexican farm workers have jobs already in their own country.

One solution could be to consider other countries with lower income per capita, such as those in Central America, which Mexican farmers are already doing. However, the population in Central American countries is much lower than in Mexico. Compounding the issue, the further you go to import immigrant low-skilled labor, the more expensive it gets.

Another alternative that looks more sustainable would be to change crop mixes and invest in technology to reduce the dependence on farm labor. These mainly apply to fruits and vegetables where new technology usually for harvesting those crops needs to become available, like shake-and-catch harvesting. Otherwise some of those high labor crops won't be able to be produced in the United States.

Agricultural economists have an important role to play by informing constituent groups and the public with objective analysis of the consequences of proposals to change immigration policy. If or when a new immigration policy is enacted into law, farm employers and employees will need to be made aware of its provisions and implications for their operations. Economists can help measure the economic feasibility of adopting new farm technologies, such as precision agriculture, mechanical harvest and use of UAVs (drones) to collect field information, among others. In addition, further analysis is required to determine if the decline in immigrant farm workers is short lived or if we are facing a new reality of a shrinking supply of farm workers globally.

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# Managing the Beef Cattle Herd through the Cattle Cycle

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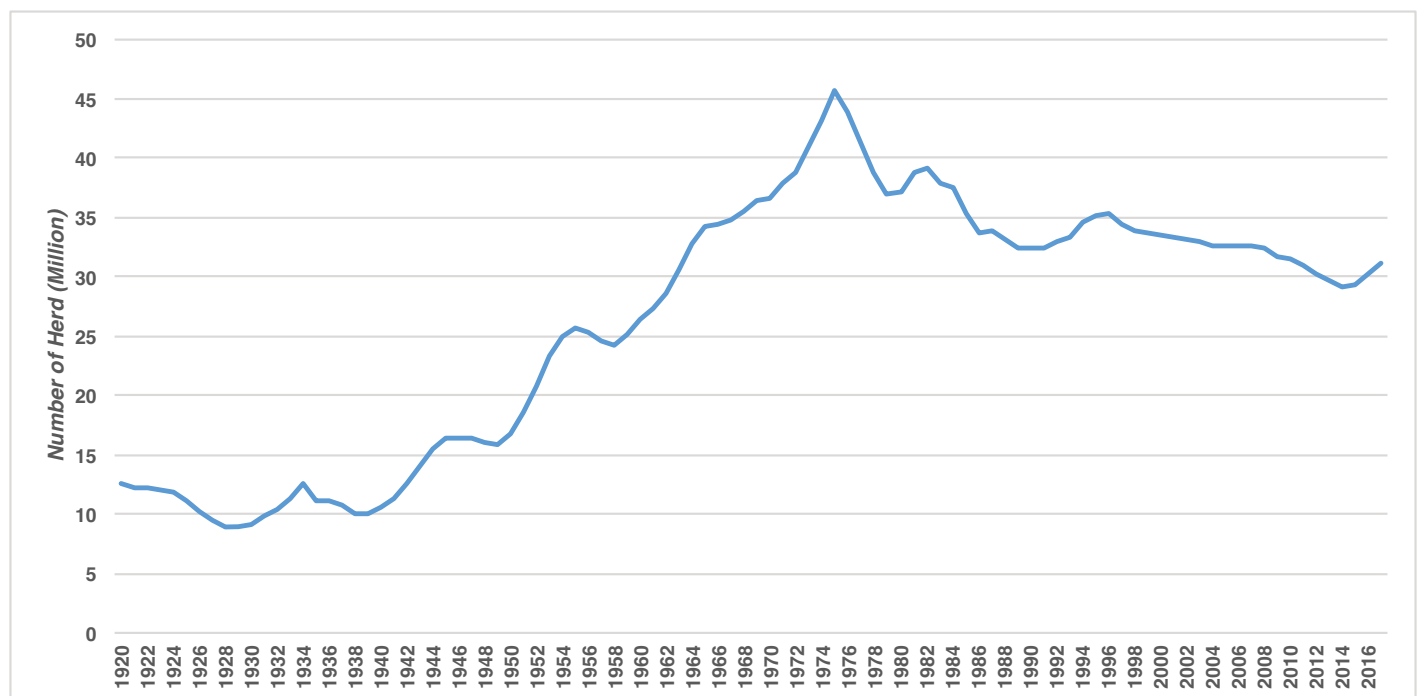
The beef cattle industry is an extremely dynamic industry that requires extensive management skills ranging from management of production components (forage, genetics, feeding systems, and health) to management of marketing characteristics (weight, time, location, and marketing method) as well as the interaction between the two.

Many production and marketing decisions are yearly decisions that vary only slightly from year-to-year unless necessitated by outside factors such as weather. However, an added intricacy to the beef cattle industry is the cattle cycle. The cattle cycle is a well-known component of the beef cattle industry, and many industry participants have navigated the cycle several times during their respective careers. The beef cattle cycle is composed of three phases: expansion, contraction, and turnaround. These three phases influence decision making and management of cattle herds across the nation.

Figure 1 illustrates January 1 beef cow inventory in the United States from 1920 to 2016. It is fairly easy to see

times of expansion and contraction in beef cow inventory which define the cycle. An individual beef cattle cycle will generally last 8 to 14 years with 10 years being the average. Periods of higher cattle prices are typically associated with the expansion phase as the higher prices spur cattle producers to retain more heifers and reduce the cull rate of mature cows that are reproductively sound. Alternately, periods of lower prices usually precipitate the contraction phase as cow-calf operations reduce the size of their cow-herds through increased cow culling and reduced heifer retention.

It is imperative cattle producers understand the cattle cycle which is primarily influenced by expectations of incentives (higher profits) and disincentives (lower profits). However, many cattle herd expansion and contraction decisions are made on short-term price information and not long-term fundamentals, which can result in lower profits than anticipated. Thus, the purpose of this publication is to outline management considerations and strategies



**Figure 1. January 1 U.S. Beef Cow Inventory from 1920 to 2016 (Million Head).**

Source: USDA-National Agricultural Statistics Service



for cow-calf producers and margin operators (stockers, backgrounders, and cattle feeders) while navigating the cattle cycle.

### **Managing Costs through Expansion and Contraction**

The cattle cycle is a major reason why the beef sector tends to have cyclical periods of good years and bad years. It is often said, it is how one manages through the good times that determines how one can manage through the tougher times. This is an accurate statement, especially as it relates to managing costs. In general, cattle producers have more control over their cost structure than over their revenue stream. Thus, it is imperative producers first understand the total cost of cattle production and then evaluate expenditure categories in which cost savings may be possible without negatively impacting production. When considering cost management strategies, it is important not to reduce a cost that will result in more lost revenue than the reduction in cost.

Major cost categories for a cow-calf operation include feed, pasture maintenance, health program, reproduction, marketing, breeding stock depreciation and overhead costs such as land, buildings and equipment. Margin operators, such as backgrounders and stocker operators, also have the purchase of the animal. Some costs are not easily reduced and often should not be. For instance, it is difficult for producers to reduce costs associated with animal health. Many cattle producers have an established vaccination program to reduce the incidence of health issues which largely minimizes health costs. Similarly, stocker producers through cattle feeders have established health practices meant to minimize health treatments and thus health costs. Thus, many producers are managing health costs by using preventative methods to reduce the incidence of sickness. Reducing money spent on a preventative health program can make the herd more vulnerable to major health issues and could lead to financial disaster through higher death losses. However, this is a common error that producers make when cattle prices are lower and profit margins are squeezed.

Cow-calf production costs developed by Standardized Performance Analysis of herds in Texas over the 2007-2011 period are contained in Figure 2. Of course in other areas of the South will be different this data provides an interesting rundown of costs. This data represents total production costs. The third largest category is purchased feed. Yet feed quickly jumps to over 20 percent of total costs when fertilizer is included.

The largest cost categories are usually the easiest to reduce costs without negatively influencing profits. For most operations, feed costs will be the largest cost category and may include pasture, hay, fertilizer, supplemental feed, and mineral. From a feed cost standpoint, mechanically harvested feedstuffs, such as hay, that are typically fed in the winter are usually more expensive than forages harvested by the animals. For the cow-calf and stocker producer, managing cost through improved grazing strategies can be one method of reducing feed costs without negatively impacting production. Grazing strategies to evaluate include rotational grazing, specie diversification (cool and warm season perennial grasses), annual forages, and stockpiling. These practices may not work in every production system, but they generally have a lower cost per unit of production than mechanically harvested feedstuffs. Producers should consider ways to increase the number of grazing days per year if those additional grazing days can be added for less than the cost of winter feeding days.

From the cattle finisher standpoint, there is limited flexibility when managing feed costs. Cattle feeders are constantly evaluating least cost rations, but they cannot change rations quickly without negatively impacting production. Rations have to be adjusted slowly for cattle that are already on feed. The only abrupt change that can be made is when cattle are entering the feedlot.

Reproductive costs come in the form of sires to breed females and in the form of a failure to successfully breed animals. The failure to successfully breed females may be the most expensive reproductive costs. Failure to breed can occur for several reasons, but proper health and nutrition for both sire and dam are necessary to ensure that large costs are not incurred in this category. In relation to sires, the purchase of a sire is a large expenditure. One sire may be able to breed 25 to 35 cows in a short breeding season. Thus, the cost of the sire minus his expected value when he leaves the herd, should be spread across the number of females bred. For cow-calf operations that retain their own heifers, sires are typically kept for a maximum of two years. In addition to the “depreciation” of the bull, producers should also include the cost of maintaining him when estimating breeding costs for the cow-herd. The ability to spread breeding costs across more females reduces the cost per calf marketed. When multiple sires are needed and when they are not fully utilized, the use of artificial insemination or other reproductive technologies can be used to manage breeding costs.

Marketing and land costs are not easily changed. Marketing costs are associated with the method in which cattle are marketed with commission and transportation

being the most common components. Marketing costs are a cash cost when a marketing agency is utilized and a labor/management costs if private treaty is utilized. Land costs are associated with rent or the opportunity cost of rent. However, it is difficult to change land costs because obtaining land either through purchase or rent can be difficult.

The second largest cost category in the SPA data is depreciation at \$88 per cow and 14.9 percent of total costs. Depreciation costs are the ones that are often forgotten about but are critical to account for in order to be able to replace assets at the end of their useful life. Depreciation expenses can include equipment like trucks and tractors and also bulls and cows depending on how they are replaced in the herd. These are also costs that are difficult to reduce quickly. But, given that they are not cash expenses, they are often ignored until it's too late.

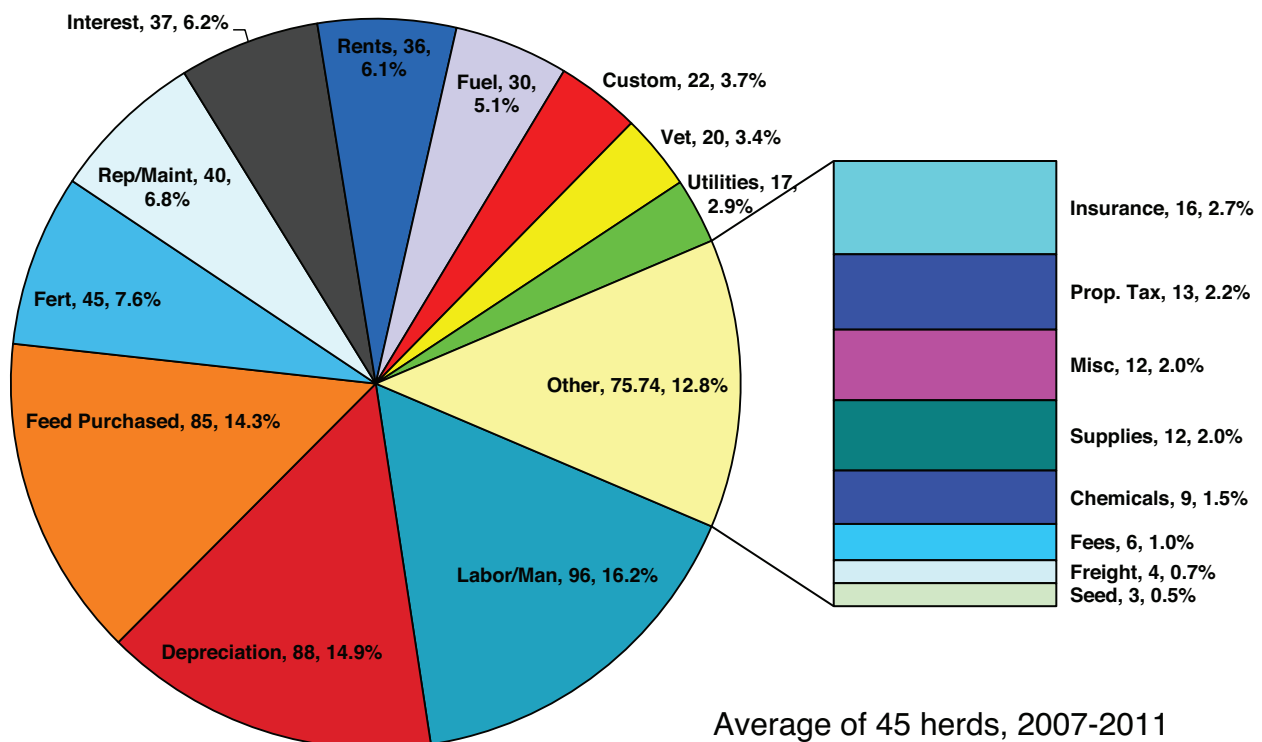
Building and equipment costs per unit of production usually decline with increases in the size of the operation. Thus, there are economies of size related to some costs. Most operations have buildings, working facilities, and equipment, but the ability of larger operations to spread those costs over more animals allows them to reduce the overall cost per animal unit. This is an area that should often be examined during low priced times of the cattle cycle as putting off major purchases, or refinancing existing

long-term debt, may improve cash flow until the market improves enough to provide additional capital.

At all points in the cattle cycle, producers are encouraged to manage costs, because this can reduce the negative effects experienced when the cattle herd is in the contraction and lower price phase. Additionally, it may benefit producers to pay down debts on land and other capital assets during the expansion and higher price phases. Operations that are efficient and have lower cost structures will be in a much better position during times of reduced cash flow.

### Cow-Calf Producer Considerations

The cattle cycle has times of high prices (leading to herd expansion) and low prices (leading to herd contraction). When prices are relatively high, producers typically retain or purchase more heifers and retain reproductively sound mature cows past their normal culling age. Producers do this to market more animals in the future and capitalize on high prices. However, over time the retention of more females results in larger calf crops and more feeder cattle being marketed in future years, which depresses prices. This is further complicated by the fact that breeding stock becomes more expensive when calf prices are high and the demand for reproductive females increases.



**Figure 2. Texas Standardized Performance Analysis (SPA) Breakdown of Expenses per Female and Percent of Total Costs in Each Category, 2007-2011.**

Source: Stan Beavers, "Standardized Performance Analysis (SPA) for Decision Making" Presentation. 2012 Beef Cattle Shortcourse, College Station, TX, August 8, 2012.

In terms of economic production costs retaining heifers is the same as purchasing those animals for the price they could be sold in the present period. Think of it as the opportunity cost of not selling that heifer at the high price. Thus, a heifer retained during time periods of higher prices is more expensive than a heifer retained in time periods of lower prices and will need to generate a greater return over her productive life to recoup that cost. In practical terms, when the costs of raising one's own heifers is lower than purchasing heifers then producers retain heifers.

Alternatively, producers generally market more heifers and cows when prices are declining. This is done because the future profitability of a heifer appears bleak given the lower price levels. However, the marketing of more heifers as calves and feeder cattle will eventually result in a smaller breeding herd and small calf crops in subsequent years. The reduction in the number of calves being marketed over time will support calf prices in the future.

The contraction and expansion tendencies previously mentioned result in producers marketing fewer animals when prices are high and marketing more animals when prices are low. This seems contrary to most business operations that try to buy when prices are low and sell when prices are high, but really occurs for two primary reasons. First, a heifer that is weaned in the fall of 2016 would be bred the first time in the spring of 2017 and wouldn't wean her first calf until the fall of 2018. This time lag between heifer retention and the impact on the size of the calf crop is a major reason why we have cattle cycles in the first place. Secondly, individual producers tend to be small and unable to affect the market. So, responding to profits by retaining heifers makes perfect sense for an individual cow-calf operation. However, when this occurs across the entire industry, supply increases and downward pressure is put on prices.

With the thought of buying low and selling high, it may be advantageous for producers to move opposite of the cycle. Thus, when prices are high, producers may want to market more animals to capitalize on high prices and then retain more heifers and build the herd when prices are low. This contrary movement can result in cash flow problems during periods of lower prices since prices are low and fewer cattle are marketed. However, revenue management during periods of high prices can help smooth the cash flow situation when prices are lower. Past research has explored this "contrarian" strategy and the results have not indicated it to be a profitable strategy.

A more common alternative utilized by producers is maintaining the same size herd. This management practice can smooth revenues relative to moving opposite of the

cattle cycle which reduces cash flow problems. This practice is fairly common as many cattle producers are fully utilizing forage resources and base production on fully utilizing that asset.

Cow-calf producers have an asset in their breeding stock which is generally built over time as genetics are improved. Thus, producers with strong genetics are hesitant to decrease herd size because of fear of not being able to replace those animals with comparable or better genetics. The building of perceived value through genetics or other ways can make it difficult for some producers to manage through the cattle cycle, but producers should consider that increased profits provide a higher propensity to replace breeding stock.

### **Margin Operator Considerations**

Margin operators, such as stocker producers, backgrounding operations, and feedlots, own animals for a much shorter time period than cow-calf producers which result in different management tactics. Since margin operators are buying and selling cattle over shorter time periods, they are more vulnerable to short-term swings in price than the longer term changes associated with cattle cycles. In truth, they can be profitable when cattle prices are high or low, but will be greatly impacted when prices swing wilding between purchase and sale.

When prices are decreasing, margin operators purchase animals on a strong market relative to the market they will sell on. A declining market requires margin operators to place more focus on managing the sell side of the business. The sell price can sometimes be managed by forward contracting cattle or using risk management strategies to lock in a price or set a floor price. Another alternative is for margin operators to reduce the number of animals purchased or stop purchasing animals. This is generally not the best alternative as many margin operators have fixed costs that are incurred regardless of the number of animals purchased. Thus, most producers will continue to purchase animals as long as variable costs are covered.

When prices are increasing, margin operators purchase animals on a relatively weak market and sell cattle on a strong market. This situation is favorable for margin operators from a selling standpoint, but increased management is needed on the purchasing side. Most margin operators purchase animals to replace the animals previously marketed. Thus, they are buying animals on just as high of a market as they are selling on. The management of future purchases when prices are increasing can reduce the purchase price of the animal which provides a larger

margin for operators to work with. The risk to this strategy is in relation to the turnaround where prices go from increasing to decreasing which could result in a producer paying more cattle.

Margin operator decisions are shorter term decisions and more risky from a capital standpoint. These decisions have more to do with operating within a phase (contraction, expansion, turnaround) of the cattle cycle than navigating the entire cycle. However, the cattle cycle should be considered when purchasing and selling cattle.

## Conclusions

The cattle cycle is a major factor in cattle production and producer profitability. The cycle is predictable from

the standpoint that there will be periods of expansion with higher prices, contraction with lower prices, and a turnaround on both ends. However, it is also unpredictable as to the timing of these phases and this is primarily where the risk exists. Outside forces, such as weather, can prolong or shorten phases of the cattle cycle. The outside influence then can enhance the effects of the next phase which increases the complexities of management.

The key points are that producers should manage costs through all phases of the cattle cycle, evaluate strategies that can reduce the financial impacts posed by the cattle cycle, and attempt to reduce risks presented through each phase. The cattle cycle has been a constant for many years, and it is likely to influence the business for many years in the future.

# Drought Sales of Livestock

Robert A. Tufts

Farming is a business that is difficult to manage. There are many factors beyond the control of the farmer. Weather is one of those factors. When the unusual occurs, the farmer must adjust. The government, in the form of income tax postponement, offers some help.

Farmers, like any other business, are required to pay tax on the net income they generate. One problem with farming is the variability in annual income; one year prices are up, the next they are down. Occasionally a major repair reduces income. Other times weather conditions force the sale of additional livestock increasing annual income.

When a farmer experiences an unusual increase in profit his income tax liability also increases. The increase may push the farmer into a higher tax bracket than usual. For example, using 2016 tax tables, if a farmer had an adjusted gross income (AGI) of \$70,000 in 2016 and 2017, he would owe \$19,145 in income taxes (\$9,572.50 each year). However, if additional, unexpected sales increased his AGI to \$140,000 in 2016 and zero in 2017, he would owe \$26,542.25 in income taxes, an additional \$7,397.25 in taxes for the same income because of timing differences.

The Internal Revenue Code offers the farmer two different options for spreading additional income because of weather-related sales over multiple years. The first is Section 451(e) Special Rule for Proceeds from Livestock Sold on Account of Drought, Flood, or Other Weather-Related Conditions. The second is Section 1033(e) Livestock Sold on Account of Drought, Flood or Other Weather-Related Conditions (part of Section 1033. Involuntary Conversion). Each section has different requirements.

There are three classes of livestock—purchased or raised for resale; purchased for draft, breeding or dairy; and raised for draft, breeding or dairy. The class of livestock determines which section should be used.

Livestock raised or purchased for resale are normally treated as “sales in the ordinary course of business” and generate ordinary income (as opposed to capital gain). The sale is reported on Schedule F. Livestock held for resale do not qualify for 1033 treatment.

Section 451(e) allows the postponement of income from the additional sales to the next year if the following qualifications are met. Farming must be the principal

business; the cash method of accounting must be used; under usual business practices, the additional animals would not have been sold during the year except for the weather-related conditions; and the weather-related conditions caused an area to be designated as eligible for assistance by the federal government.

The livestock do not have to be raised or sold in the declared disaster area. They do have to be sold because of the weather-related condition that caused an area to be declared eligible for federal assistance.

To postpone gain, a statement must be attached to the return for the year of sale. The statement must include:

- An intention to postpone gain under Section 451(e);
- Evidence of the weather-related conditions that forced the early sale and the date, if known, on which an area was designated as eligible for assistance by the federal government;
- A statement explaining the relationship of the area affected by the weather-related conditions to the early sale;
- The number of animals sold in each of the three preceding year;
- The number of animals that would have been sold in the tax year had normal business practice been followed;
- The total number of animals sold and the number sold because of weather-related conditions; and
- A computation of the income to be postponed.

Suppose a farmer’s average AGI is \$70,000. From the calculation above, his income tax liability would be \$9,572.50. If the farmer sold an additional \$20,000 of livestock in 2016, AGI of \$90,000, because of a federally declared drought in his area and he did not claim the 451(e) relief his income tax liability in 2016 would be \$14,042.25. Suppose his 2017 income was \$50,000 (for a 2-year average of \$70,000), then his 2017 tax liability would be \$6,572.50 for a 2-year total of \$20,614.75. If the farmer claimed the 451(e) relief and postponed the additional \$20,000 of sales to 2017 his 2-year tax liability would have been \$19,145.00. The savings are \$1,469.75.



The tax bracket changes to 25% for married filing jointly at \$75,301; so, the savings are the additional \$14,699 (\$90,000 - 75,301) taxed at 25% instead of 15%. If the farmers AGI had been only \$50,000, an additional \$20,000 would not have changed his tax bracket and the total tax would have been the same.

The result would have been different if the additional \$20,000 had been raised breeding stock. Livestock used in a farm business generally qualify as Section 1231 property. That means gains are treated as capital instead of ordinary and losses are treated as ordinary instead of capital. If the \$20,000 of capital gain had been deferred to 2017, the tax rate would have been zero. The long-term capital gains tax rate is 0%, 15% or 20% depending on the ordinary income tax bracket. Long-term means the property was held for at least one year (24 months for cattle and horses). For this example, at \$50,000 of ordinary income and \$20,000 of capital gains, the farmer is in the 15% ordinary income tax bracket which means his capital gains rate is 0%. The 2-year total tax would have been \$16,145.00 (the same \$9,572.50 for 2016 and \$6,572.50 for 2017) or \$3,000 less.

If the \$20,000 of additional sales had been purchased breeding stock, the result would have been different from the two previous examples. Purchased livestock is a depreciable asset. Depreciation is not optional, the IRS calculates your taxes as if you claimed it whether you did or not. Suppose the animals had been purchased a few years ago for \$21,000 and \$12,000 of depreciations had been claimed. The basis in the animals would have been \$9,000. The gain would have been \$11,000. The entire gain is depreciation recapture under Section 1245 and is treated as ordinary income. Also, depreciation recapture cannot be deferred but must be repaid in the year of disposition. Income for 2016 would be \$81,000 and income tax liability would be \$11,792.25. There would be no tax liability for the \$9,000 of basis; so, income for 2017 would be \$50,000 and the total tax would be \$18,364.75. Since the entire gain is depreciation recapture, none of the sales price can be postponed to the next year. The result depends on the basis in the assets sold.

If a farmer has to sell livestock because of weather-related conditions and qualifies for 451(e) treatment, he would get the most benefit from selling raised breeding livestock. The minimum benefit of claiming 451(e) relief for any class would be to spread the tax liability over two years instead of paying additional tax in the year of sale. The additional benefit would depend on the class of livestock and whether two or more tax income tax brackets were involved.

Section 1033 is for property that is compulsorily or involuntarily converted. It provides that if property is converted, within two years, to similar property, no gain will be recognized on the exchange.

Subparagraph (e) is a special rule for livestock, other than poultry, that are held for draft, breeding or dairy. The sale or exchange of livestock in excess of the number a farmer would have normally sold shall be treated as involuntarily converted if such livestock are sold or exchanged solely because of drought, flood or other weather-related conditions. It is not necessary that the area be eligible for federal assistance, but if federal assistance is available the replacement period lengthens from two years to four.

Continuing the example above, livestock held for resale, whether purchased or raised, and poultry do not qualify for Section 1033 treatment. If there is no federal assistance, the income must be claimed in the year of sale.

The raised livestock held for breeding in the example above would qualify for 1033 treatment. The basis in the livestock is \$0 since the cost of raising the livestock was expensed in the year paid. If there was no federal declaration, 451(e) treatment would not be available. The question is, should you defer the gain or claim it in the year of sale? The sale of the breeding stock qualify for capital gains treatment regardless of the weather. For 2016 any amount of long-term gain (24 months for cattle and horses) when added to ordinary income that is less than \$75,301 should be claimed in the year of sale since the capital gains rate would be zero. The ordinary income tax on the \$70,000 is the same \$9,572.50. If the entire \$20,000 of long-term capital gain were recognized in the year of sale the additional tax would be \$2,205.

A better strategy may be for the farmer to recognize \$5,301 of gain since he would owe no tax on that amount. Deferring the tax under Section 1033 on the \$14,699 would reduce the 2016 income taxes by \$2,205. If the farmer purchased replacement stock in 2017 for \$20,000 his basis would not be \$20,000 paid but the substituted basis of \$5,301. Section 1033 does not eliminate the tax, it only defers it to the next sale or exchange. The replacement stock could be sold in a year when the marginal, ordinary income tax rate was 15% so that no tax would be due on the sale of the capital assets.

Section 1033 provides the most benefit for purchased breeding stock. Normally depreciation recapture would be required in the year of sale, but that is not the case under 1033. Under 451(e), the \$11,000 of depreciation recapture had to be claimed in the year of sale and could not be deferred. Under 1033, gain on the \$20,000 sale would



not be recognized. The basis of the replacement livestock would be adjusted to reflect the exchange. If replacement livestock were purchased for \$22,000, the basis would be \$11,000 (\$9,000 substituted basis plus \$2,000 additional investment. If only \$18,000 was used to purchase replacement livestock, then the farmer would have to recognize \$2,000 from the original sale and the basis would be the substituted basis of \$9,000.

To elect 1033 treatment, the farmer would file a statement with his tax return for the year of sale and the year replacement property was purchased. The statement for the year of sale would include:

- Evidence of the weather-related conditions that forced the sale or exchange of the livestock;
- The gain realized on the sale or exchange;
- The number and kind of livestock sold or exchanged; and
- The number of livestock of each kind that would have been sold or exchanged under usual business practice.

The statement for the year replacement livestock was acquired would include the information above plus:

- The dates replacement livestock was purchased;
- The cost of the replacement livestock; and
- A description of the replacement livestock including the number and kind.

The sale of livestock because of weather-related conditions will increase income and tax liability. The Internal Revenue Code has two provisions that might allow the postponement of the recognition and thereby reduce the amount of income tax owed. The effect will be determined by the Code section used and the class of livestock. This article demonstrates the difference for a particular scenario. It is not meant to apply to a the reader's facts. A tax professional should be consulted to determine the effect in a particular situation.

# Livestock Outlook

David P. Anderson, Andrew P. Griffith, and Kenny H. Burdine

The livestock sector makes an important contribution to the agricultural economies in the Southern states, often generating a larger share of agricultural receipts than the crop sector. Livestock producers in the South are major parts of the cattle, hog, broiler, and turkey industries (and, of course, also other animal agriculture like catfish and fisheries).

Most of these livestock sectors have experienced record high prices in recent years and unprofitable prices too. Over the last decade, a series of events have triggered adjustments across the livestock industry. The first of these cross-cutting events was the ethanol boom that began in late 2006. Increased demand for corn for ethanol production led to sharply higher corn prices. Soybeans were also affected as the two major commodities competed for acreage. Feed supplies began to grow over the next several years, but were largely set-back by a severe drought in 2012. These increases in feed costs led to financial losses that kicked off a contraction in livestock and meat production. More recently, feed supplies have rebuilt and prices have fallen. Falling feed costs as production catches up with demand will spur increased livestock and meat production.

The second issue in common is total meat production, which directly impacts per capita meat supplies. The year 2014 was a phenomenal year across the board for all meats and all species received a clear expansion signal in the markets. Of course, expansion can occur in poultry and pork markets very quickly and both saw significant production increases during 2015. It wasn't until the following year that beef production saw its first year-over-year increase. Total red meat and poultry production hit a record in 2016 and is projected to continue to grow in coming years. Increased meat production will result in lower prices and stiff competition between sectors. Given the expected increases in meat production, export levels will ultimately determine how large the impact is on per capita meat supplies in the US.

The third cross-cutting issue is trade. United States and Southern livestock agriculture have become increasingly dependent on exports while imports are an important part of the beef industry. Beef exports have grown to over 10% of production. Broiler exports have approached 20% of

production, while pork exports have exceeded 20% of domestic production since 2011.

The fourth cross-cutting issue is the impact of animal diseases. Major disease outbreaks have affected pork and poultry production in the last few years. While these have not directly affected Southern producers in terms of production losses they have had major indirect effects. High Pathogenic Avian Influenza (HPAI) and Porcine Epidemic Diarrhea (PED) have hit the U.S. poultry and pork industries. The most important impacts have been death losses in the case of PED and trade impacts in the case of HPAI.

The remainder of this paper briefly examines the outlook for the cattle, pork, and poultry sectors over the next couple of years. Production, prices, producer returns, future path, and problems are discussed for each sector.

## Cattle

Increasing costs, record drought in the Southern Plains, and conversion of pasture and hay ground to row crops led to the smallest cattle inventory and beef cow numbers in decades in 2014. Beef production hit its lowest level since 1992, at 23.8 billion pounds, in 2015. Calf, feeder, and fed cattle prices hit record highs in the Fall of 2014. Drought recovery coupled with record high calf prices and profits led to the fastest herd expansion since the early 1970s.

Increasing beef production and cattle supplies, greater competition from pork and poultry in the meat case, and decreased export levels have led to falling calf and cattle prices. By the second quarter of 2016, Southern Plains 500-600 pound steer prices had declined 37% from the year before and were at their lowest since 2013. Feeder and fed cattle prices were also their lowest since 2013. Beef production grew by 6.4% in 2016 and is projected to increase by close to 4% in 2017 and 2018. While production grows, cattle and calf prices will continue to decline.

Beef demand has fared well over this decade in the face of record high prices. By some demand index measures, beef demand has been the highest in 25 years. Beef imports surged in 2015 largely due to higher prices, drought in Australia decreasing their production or export levels, and

a strong dollar. Beef exports struggled under high prices, a strong dollar, and some weaknesses in the economies of importing countries.

Cattle producers are facing the pressure of falling prices. While calf prices remain historically high they are declining and drastically squeezing profits at the cow-calf level. The tight cattle supplies and record high calf prices of 2014 and 2015 also led to record high replacement female prices. Producers paid extremely high prices for cows and heifers and the recent declines in calf prices are pressuring producer's ability to pay off high priced breeding stock. Declining prices also has the effect of reducing asset values across the herd. Cow values may be below what is owed on cows for some producers who financed breeding stock during the extremely high priced times. Periods of falling cattle prices have both cash flow and balance sheet (wealth) impacts on cattle producers.

Increasing cattle numbers will shift negotiating power to the buyer side of the equation and allow them to be more selective. It is likely that discounts for poorer quality cattle will grow. Pre-conditioning, management practices, and quality genetics will become more important to limit price discounts for producers in coming years. During 2014 and 2015, it was very difficult not to make money in the beef cattle sector. Over the next couple years, profits will be much lower and many producers will likely be unable to cover all their costs.

## Hogs

About 28% of the nation's breeding hogs are in the South. While largely unscathed, directly, by PEDv the industry has not been unaffected. Unprecedented returns in 2014 were driven by decreasing pork production caused by PEDv. Record high pork prices and returns have triggered industry expansion. PEDv was just the latest event to impact the industry. The hog industry was whipsawed by record feed costs, along with the rest of livestock agriculture.

Pork production dropped to 22.8 billion pounds in 2014, but rebounded 7% to 24.5 billion pounds in 2015. Pork production grew by 1.8% in 2016, and will likely grow another 2.8% in 2017. Hog prices have fallen by more than 30% from their record highs in 2014. But, decreasing

feed costs have kept returns largely profitable in 2016. Increasing production will likely limit any price increases.

One of the most watched upcoming events in the pork industry will be the opening of two new packing plants in 2017. Those new plants will likely provide a boost to hog prices as they compete for market share. Exports will continue to be extremely important for pork and hog prices and economic growth in Asia, coupled with lower price levels, should continue to be supportive to exports.

## Poultry

HPAI had an indirect effect on broiler production through reducing exports. Broiler exports declined by about 14%, or one billion pounds, from 2014 to 2015 and have continued to lag behind 2015. Even though exports have declined, production has continued to grow. In 2016, U.S. broiler production rose by 1.6%.

Production growth has come through the number of birds and bird weights. Growth has come through the investment in new production facilities requiring more new contract producers. It appears that growth will continue into 2017. Events that pressure or reduce production could result in pressure on contract producers.

Record high feed costs over the last decade forced many bankruptcies among broiler companies. Lower feed costs will cushion the blow of lower chicken prices, but events in the feed sector are always a worry as weather patterns can quickly change the feed supply picture. Disease events will continue to be a large concern going forward. Even though an outbreak may not effect a producer or region directly, related trade restrictions would affect the entire industry.

## Summary

Each of our livestock sectors is facing significant challenges. On the cattle side, cyclical expansion of beef production is leading to falling calf prices. Pork production is also increasing, which is leading to lower returns. In combination with increasing poultry production, total meat production will hit a new record high in 2017. Total meat supplies will pressure all meat and livestock prices lower in 2017. Exports will be a key for prices in 2017 and 2018.

# Cashflow Outlook for Representative Farms

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The purpose of this paper is to project the cashflows for AFPC's representative crop farms through 2020. The farms are assumed to have selected Agriculture Risk Coverage - County Coverage (ARC-County) or Price Loss Coverage (PLC), based on information provided by the farm panels. The farms are simulated starting in 2014 with 20% and 40% beginning debt to asset ratios. The August 2016 FAPRI baseline provides the price outlook for the analysis (<https://www.fapri.missouri.edu/wp-content/uploads/2016/08/Report-05-16.pdf>).

The Texas A&M Agricultural and Food Policy Center maintains a database of 64 crop farms. The farms are located in major production regions (Figure 1). The farms are representative of full-time commercial operations that are typical of moderate size farms in the county. In some locations, a second farm that is two to three times larger

than the moderate size farm is also analyzed.

Data to define the farms is developed in a consensus building interview process with 4-6 farmers of similar farm size, crop mix, and farming practices. The focus group panels are selected by local extension personal and other involved stakeholders. Many of the farm panels have been interviewed every two to three years since 1988. The farm panels provide information on: farm size, crop mix/rotation, fixed costs, variable costs by enterprise, machinery replacement, yields, farm program history, marketing strategy, and debt structure.

The representative farms are generally simulated in FLIPSIM for 2014-2020 under alternative farm program, macro economic, and debt assumptions. For this analysis, farm policy is assumed constant and only initial debt level is varied. The FAPRI baseline provides a stochastic

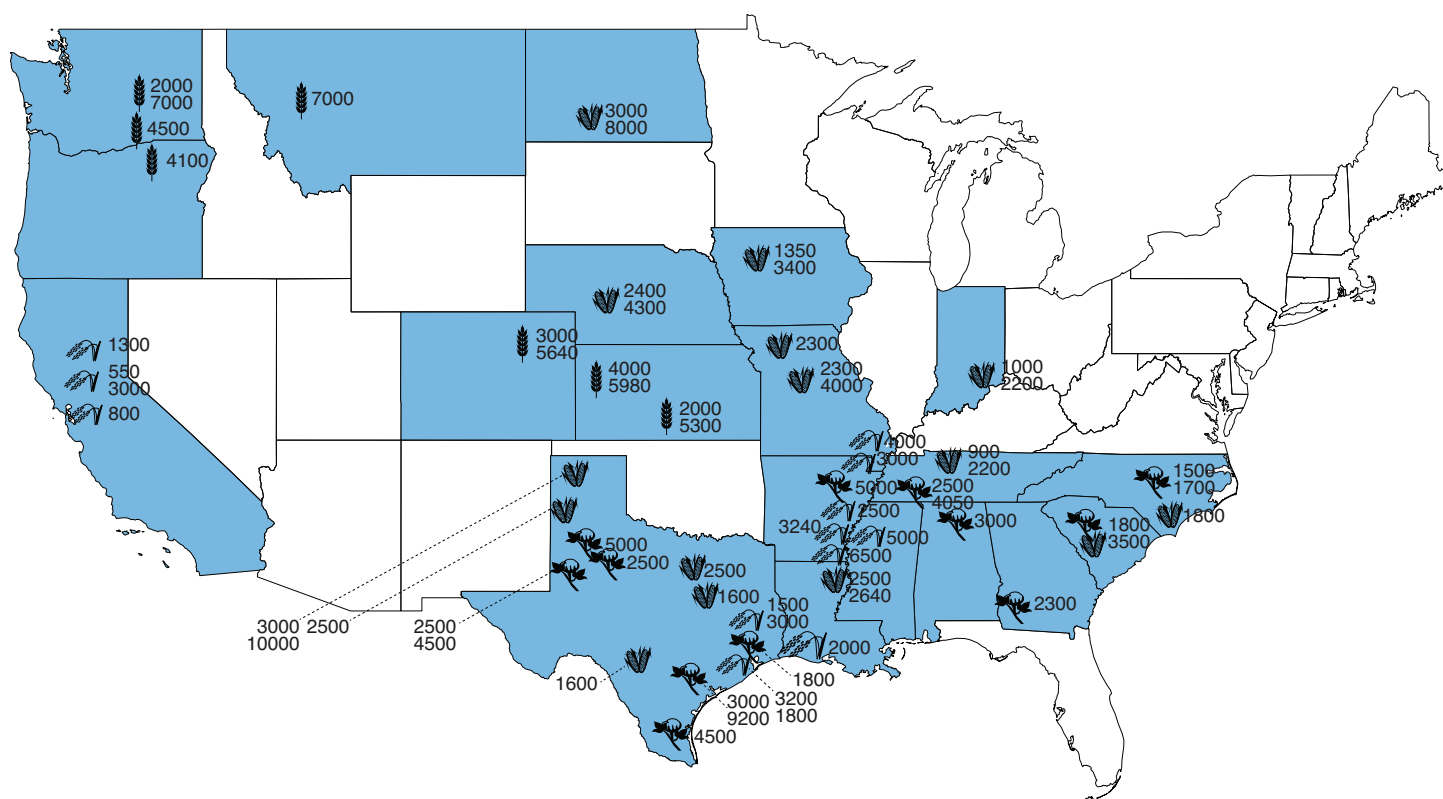


Figure 1. AFPC Representative Crop Farms.

**Table 1. Probability of Annual Cash Flow Deficits for Representative Feedgrain Farms Assuming 20% and 40% Initial Debt to Assets Ratios in 2014.**

	20% Beginning Debt to Asset Ratio in 2014						40% Beginning Debt to Asset Ratio in 2014				
Farms	2016	2017	2018	2019	2020		2016	2017	2018	2019	2020
IAG1350	99	99	99	98.8	99		99	99	99	99	99
IAG3400	56.2	49.8	43.2	40.8	42.8		99	97.8	94.8	95	95.2
NEG2400	76.2	69	66.2	70	73		98.4	94.2	91.6	91	94
NEG4300	88.8	87.4	85.6	85.4	85.2		99	99	99	98.8	99
NDG3000	81.2	76	73.4	69.8	71		99	96.6	94.2	92.6	93.8
NDG8000	61.2	52	44	36.6	37.6		99	98.6	97.2	95.6	96
ING1000	82.2	72	73.6	64.8	62.4		99	99	99	99	99
ING2200	99	97.6	95.8	95.2	95.4		99	99	99	99	99
MOCG2300	24.4	8.4	4.2	2.4	1.6		99	99	99	98.8	99
MOCG4200	1	1	1	1	1		64.6	34.8	25.4	20.6	14.8
MONG2300	27.4	24	24.2	24.6	27.4		99	99	99	99	99
LAG2640	91	83	81	77.6	76.6		97.6	93.6	89.4	87.6	88
LANG2500	85	58	42.8	34.8	34.6		99	99	99	99	99
TNG900	99	99	99	98.2	97		99	99	99	99	99
TNG2200	99	99	99	98.6	98		99	99	99	99	99
NCSP1800	99	99	99	99	99		99	99	99	99	99
SCG3500	94	83	79.2	74.6	74.2		99	99	99	99	99
TXNP3450	1	1	1	1	1		1.8	1	1	1	1
TXNP10640	2	1.8	1	1	1		55.8	38.6	29.4	22.8	22
TXPG2500	86.2	58.4	44.4	33	28.4		99	97	92.8	89.2	89.8
TXHG2500	99	99	99	99	99		99	99	99	99	99
TXWG1600	99	99	99	99	99		99	99	99	99	99
TXUG1600	37.2	35.2	40.8	37.8	50.4		80.4	59.8	62.8	58.2	66
No. > 50%	17	16	13	13	14		22	20	20	20	20
No. Farms	23	23	23	23	23		23	23	23	23	23

projection of crop prices along with rates of inflation for inputs used for the representative farms. Stochastic crop yields are simulated using a multivariate empirical probability distribution.

The results of the cashflow analysis are summarized in Tables 1-4. The names for the representative crop farms consist of the state, crop, and number of acres, for example IAG1350 is an Iowa grain farm with 1,350 acres. The results in Tables 1-4 are provided in terms of the probability that the farm will experience a negative cashflow, assuming a 20% or a 40% beginning debt to asset (D/A) ratio in 2014. A negative cashflow (NCF) occurs when the farm's expenses for principal payments, income taxes, repayment of previous cashflow deficit loans, and family living exceed net cash income plus beginning cash reserves. The

FLIPSIM model handles cashflow deficits by creating a one-year extension of the operating loan that must be repaid in the next year.

Assuming a 20% beginning debt in 2014, the IAG1350 farm has a 99% chance of a NCF each year for 2016-2020 (Table 1). In contrast, the large Iowa grain farm (IAG3400) with a 20% initial debt has probabilities of a NCF ranging from 41 to 56% over the 2016-2020 study period. However, increasing the initial D/A to 40% on the IAG3400 farm results in a probability of NCF greater than 95% for 2016-2020 (Table 1). The northern Louisiana grain (LANG2500) farm has an 85% chance of a NCF in 2016 with an initial D/A of 20%, but the probability of NCFs decreases to 35% by 2020. Assuming a 40% D/A ratio in 2014 results in a 99% chance of NCF in all years for the LANG2500 farm. The LAG2640 farm has relatively high probabilities of

**Table 2. Probability of Annual Cash Flow Deficits for Representative Wheat Farms Assuming 20% and 40% Initial Debt to Assets Ratios in 2014.**

	20% Beginning Debt to Asset Ratio in 2014						40% Beginning Debt to Asset Ratio in 2014				
Farms	2016	2017	2018	2019	2020		2016	2017	2018	2019	2020
WAW2000	13.8	9.4	4.2	2.4	2.6		85.4	54.4	34.8	25.2	20.6
WAW8000	99	97.6	88.8	81.8	80		99	99	99	99	98.6
WAAW4500	99	99	99	99	99		99	99	99	99	99
ORW4100	99	94.6	83.8	80.4	76.6		99	99	99	99	99
MTW7000	22.8	2.2	1	1	1		98.8	84.2	63.6	43.4	36
COW3000	86.4	79.4	80.2	85	90.4		99	99	99	99	99
COW5640	99	99	99	99	99		99	99	99	99	99
KSCW2000	99	99	99	98.2	98.2		99	99	99	99	99
KSCW5300	43.4	29	21.6	16.4	14.6		99	92.2	80.4	69.8	64.8
KSNW4000	99	99	98.4	96.8	97		99	99	99	99	99
KSNW5980	99	99	99	99	99		99	99	99	99	99
No. > 50%	8	8	8	8	8		11	11	10	9	9
No. Farms	11	11	11	11	11		11	11	11	11	11

**Table 3. Probability of Annual Cash Flow Deficits for Representative Cotton Farms Assuming 20% and 40% Initial Debt to Assets Ratios in 2014.**

	20% Beginning Debt to Asset Ratio in 2014						40% Beginning Debt to Asset Ratio in 2014				
Farms	2016	2017	2018	2019	2020		2016	2017	2018	2019	2020
TXSP2500	34.6	29.6	25	22.4	32		62.8	50.6	46.2	40.8	49.8
TXSP4500	32.4	25.8	25.6	23	27.6		69.6	57.4	55.2	50.4	50.2
TXEC5000	80.6	60	48.4	44.8	44.4		99	98.8	95.2	93.6	94
TXRP2500	99	99	99	99	99		99	99	99	99	99
TXMC1800	96.2	93	93	91.6	92		99	99	99	98	98.6
TXCB3000	36.2	26.6	29.4	34	39.2		70.6	59.8	62.6	67.4	71.2
TXCB9200	82	78.4	76	81	80.4		95	92.2	89.2	89.8	92.2
TXVC4500	29.6	17.8	10.2	11.2	12.8		95.8	83	74.4	72.4	74.2
TNC2500	3.8	4.6	1.6	2.4	2.6		38.2	18.2	11	10.4	8.4
TNC4050	98.8	97.4	94.6	91.8	91.4		99	99	99	99	99
ALC3000	99	99	99	99	99		99	99	99	99	99
GAC2300	99	97.4	95.2	93.6	93.6		99	99	99	99	99
SCC1800	94.2	89.8	87.2	83.6	80.2		99	99	99	99	98.6
NCC1700	99	99	98.4	97.8	98.2		99	99	99	99	99
NCNP1500	99	99	99	99	99		99	99	99	99	99
No. > 50%	10	10	9	9	9		14	14	13	13	13
No. Farms	15	15	15	15	15		15	15	15	15	15



**Table 4. Probability of Annual Cash Flow Deficits for Representative Rice Farms Assuming 20% and 40% Initial Debt to Assets Ratios in 2014.**

	20% Beginning Debt to Asset Ratio in 2014						40% Beginning Debt to Asset Ratio in 2014				
Farms	2016	2017	2018	2019	2020		2016	2017	2018	2019	2020
CAR550	99	99	99	99	99		99	99	99	99	99
CAR3000	74.4	57	48.4	54.4	64.4		99	99	99	99	99
CABR1300	2.8	1	1	1	1		42.2	11	8.4	9	8
CACR800	26.8	12.2	8.6	10.4	13.4		99	99	99	99	99
TXR1500	44.4	13.6	12	25.2	33.2		99	90	85.2	96.8	96.6
TXR3000	20.2	12	10	14.6	40		73	55.4	42.4	50	77
TXBR1800	1	1	1	1	1		6	1	1	1	1
TXER3200	99	99	99	99	99		99	99	99	99	99
LASR2000	96	96.4	94.4	92.4	89.6		99	99	99	99	98.4
ARMR6500	99	99	99	99	99		99	99	99	99	99
ARSR3240	99	98.2	95.2	93	93.4		99	99	99	99	99
ARWR2500	99	99	99	99	99		99	99	99	99	99
ARHR4000	93.8	83.6	79.2	81.2	90.6		99	99	99	99	99
MSDR5000	22.4	23	28.2	28.2	35.2		98.8	98.2	97.2	97.6	98
MOBR4000	99	99	99	99	99		99	99	99	99	99
No. > 50%	9	9	8	9	9	13	13	12	13	13	13
No. Farms	15	15	15	15	15	15	15	15	15	15	15

annual NCF for both initial D/A assumptions. Assuming a 20% D/A ratio in 2014, 17 of the 23 feedgrain farms have significant probabilities of NCF in 2016 (Table 1). If the farms started 2014 with a 40% D/A ratio, 20 of the 23 farms will have a high probability of a NCF over the entire 2017-2020 period (Table 1).

Eight of the 11 wheat farms have a significant cash flow problem in 2016-2020 if they started 2014 with a 20% D/A ratio (Table 2). Wheat farms with a 40% D/A ratio in 2014 are in much greater danger of NCF, with all 11 having more than a 50% chance of NCF in 2016 and 2017. Two of the wheat farms are able to improve their cash flows over the five-year period to the extent that they no longer exceed a 50% chance of NCF in 2020.

Ten of the 15 cotton farms have more than a 50% chance of a NCF in 2016, assuming a 20% initial D/A ratio and the situation does not improve for most of the farms by 2020 (Table 3). For cotton farms with a 40% beginning D/A ratio, the probability of a NCF is higher with 14 of the 15 having more than a 50% chance of NCFs by 2016 and the majority having more than a 90% chance of NCFs.

Nine of the 15 representative rice farms have more than a 50% chance of NCF in 2016, assuming a 20% D/A in 2014 (Table 4). If the representative rice farms started

2014 with a 40% D/A ratio, 13 of the 15 would have more than a 50% chance of a NCF in 2016 and the probability of avoiding a NCF does not improve by 2020.

The question that needs to be asked is: how much does annual net cash income have to increase for farms to overcome a negative cash flow in 2020? The next question is: how much does annual net cash income have to increase to insure no loss in real net worth in 2020? To address these two questions, the representative crop farms were simulated to calculate two net income adjustment (NIA) coefficients.

- NIA to maintain real net worth through 2020,
- NIA to insure a zero ending cash in 2020.

The NIA values are presented in Tables 5-8.

The Missouri grain farm (MOCG2300) needs to increase its annual net cash income \$24,310 (NIA) to avoid cash flow deficits if it initially had a 40% D/A (Table 5). If the initial D/A was 20%, the NIA is actually negative, as this farm's probability of a NCF decreases over the period (Tables 1 and 5). The Tennessee grain farm (TNG900) has an annual NIA of \$19,230 to maintain a zero ending cash position in 2020, under the 20% D/A scenario. To maintain real net worth in 2020, the TNG900

**Table 5. Annual Net Income Adjustments Necessary to Maintain Real Net Worth and to Achieve Zero Ending Cash Balance for Feedgrain/Oilseed Farms, 2014-2020, Assuming 20% and 40% Initial Debt to Assets Ratio.**

Farms	NIA to Maintain RNW			NIA for \$0 Ending Cash	
	20% Debt	40% Debt		20% Debt	40% Debt
	(\$s)	(\$s)		(\$s)	(\$s)
IAG1350	21.88	25.31		28.02	42.67
IAG3400	0	4.11		-1.63	17.67
NEG2400	2.12	4.4		5.29	14.74
NEG4300	6.15	10.45		9.53	27.26
NDG3000	4.02	6.58		4.69	15.63
NDG8000	-5.27	0		-2.88	18.94
ING1000	-6.57	-3.59		2.46	26.73
ING2200	0	5.32		13.12	42.81
MOCG2300	-24.12	-17.77		-16.93	24.31
MOCG4200	-33.65	-29.75		-35.36	-8.97
MONG2300	-3.89	1.71		-3.72	26.4
LAG2640	1.52	2.75		6.9	10.71
LANG2500	-6.31	0		-1.88	18.03
TNG900	6.24	12.85		19.23	37.8
TNG2200	5.5	1073%		21.75	41.5
NCSP1800	19.93	22.79		36.37	47.99
SCG3500	-1.31	4.85		4.3	21.06
TXNP3450	-24	-23.4		-32.28	-26.71
TXNP10640	-15	-12.91		-17.24	-5.8
TXPG2500	-9.06	-6.49		-2.99	6.56
TXHG2500	31.7	35.93		54.12	67.77
TXWG1600	22.09	24.85		34.28	44.6
TXUG1600	-2.6	-2.29		-0.13	1.74
No. > Zero	12	16		13	20
No. > \$10,000	4	7		7	18
No. Farms	23	23		23	23

farm needs to increase annual net income by \$6,240 and \$12,850 for the 20% and 40% initial D/A ratio scenarios, respectively (Table 5).

The annual NIA values to avoid a NCF in 2020 for the representative wheat farms are positive for seven of the 11 farms. The WAAW4500 farm has the largest NIA to achieve a zero ending cash position at \$47,930 (for 20% D/A) and \$66,120 (for 40% D/A) (Table 6). The annual NIA values, to avoid a decrease in real net worth, are greater than zero for seven of the 11 wheat farms if initial D/A was 20% and nine of the 11 if initial D/A was 40%. In many cases, the NIAs are small relative to farm's gross receipts, suggesting that the farms could make adjustments to avoid significant cashflow and equity issues.

Three of the representative cotton farms (TXRP2500, ALC3000, and NCNP1500) need to increase net income more than \$25,000/year (20%D/A) and more than \$34,000/year for 40% D/A to avoid cash flow deficits in 2020 (Table 7). Six of the farms are not likely to experience NCFs in 2020, but their NIA values are less than \$15,000 (25% D/A) so they do not have a healthy margin for error.

Three of the representative rice farms (CAR550, ARMR6500, and MOBR4000) have NIA's greater than \$20,000/year (20% D/A) to avoid NCFs in 2020 and six farms have NIA's more than \$20,000 if their initial D/A was 40% (Table 8). The remaining rice farms have cashflow NIAs that are closer to zero, indicating that presently the

**Table 6. Annual Net Income Adjustments Necessary to Maintain Real Net Worth and to Achieve Zero Ending Cash Balance for Wheat Farms, 2014-2020, Assuming 20% and 40% Initial Debt to Assets Ratio.**

Farms	NIA to Maintain RNW			NIA for \$0 Ending Cash	
	20% Debt	40% Debt		20% Debt	40% Debt
	(\$s)	(\$s)		(\$s)	(\$s)
WAW2000	-15	-12.5		-18.89	-8.36
WAW8000	1.12	4.25		7.33	21.33
WAAW4500	31.26	36.39		47.93	66.12
ORW4100	-2.11	2.21		-1.97	17.52
MTW7000	-18.1	-12.82		-20.78	-2.8
COW3000	15	22.63		13.38	55.26
COW5640	13.55	22.13		27.54	53.57
KSCW2000	12.15	16.07		24.4	42.26
KSCW5300	-10.62	-7.23		-10.25	4.3
KSNW4000	7.1	13.62		17.13	37.82
KSNW5980	19.1	27.53		32.16	56.99
No. > Zero	7	8		7	9
No. > \$10,000	5	6		6	8
No. Farms	11	11		11	11

**Table 7. Annual Net Income Adjustments Necessary to Maintain Real Net Worth and to Achieve Zero Ending Cash Balance for Cotton Farms, 2014-2020, Assuming 20% and 40% Initial Debt to Assets Ratio.**

Farms	NIA to Maintain RNW			NIA for \$0 Ending Cash	
	20% Debt	40% Debt		20% Debt	40% Debt
	(\$s)	(\$s)		(\$s)	(\$s)
TXSP2500	-10.15	-9.09		-4.27	1.24
TXSP4500	-8.03	-6.73		-5	0.6
TXEC5000	-5.23	-3.04		-1.13	7.05
TXRP2500	19.69	22.25		24.79	34.73
TXMC1800	6.37	8.4		10.3	17.58
TXCB3000	-2.15	-0.28		-2.17	4.64
TXCB9200	4.24	5.35		7.63	12.76
TXVC4500	-6.03	-2.81		-7.17	3.93
TNC2500	-12.05	-11.55		-15.62	-10.77
TNC4050	1.36	3.42		7.59	14.81
ALC3000	18.24	19.86		30.31	36
GAC2300	0	3.82		5.64	17.41
SCC1800	-1.31	\$3		5.95	16.07
NCC1700	11.01	14.24		19.46	31.12
NCNP1500	17.21	19.69		33.19	43.39
No. > Zero	8	9		9	14
No. > \$10,000	4	4		5	9
No. Farms	15	15		15	15

**Table 8. Annual Net Income Adjustments Necessary to Maintain Real Net Worth and to Achieve Zero Ending Cash Balance for Rice Farms, 2014-2020, Assuming 20% and 40% Initial Debt to Assets Ratio.**

Farms	NIA to Maintain RNW			NIA for \$0 Ending Cash	
	20% Debt	40% Debt		20% Debt	40% Debt
	(\$s)	(\$s)		(\$s)	(\$s)
<b>CAR550</b>	13.4	20.03		20.12	37.97
<b>CAR3000</b>	0	2.83		2.68	11.4
<b>CABR1300</b>	-14.12	-9.51		-18.4	-6.16
<b>CACR800</b>	0	4.89		-1.89	7.99
<b>TXR1500</b>	-4.96	-3.1		-1.46	7.04
<b>TXR3000</b>	-2.81	-2		-1.06	3.21
<b>TXBR1800</b>	-17.92	-17.44		-22.86	-19.13
<b>TXER3200</b>	8.13	9.97		12.05	17.91
<b>LASR2000</b>	-1.57	-0.19		6.27	11.24
<b>ARMR6500</b>	33.5	36.78		53.5	65.5
<b>ARSR3240</b>	3.7	7.33		9.84	20.41
<b>ARWR2500</b>	2.19	5.74		14.3	33.66
<b>ARHR4000</b>	3.8	\$7		6.26	20.56
<b>MSDR5000</b>	-6.04	-1.86		-2.73	17.13
<b>MOBR4000</b>	11.27	15.56		24.31	41.46
<b>No. &gt; Zero</b>	9	9		9	13
<b>No. &gt; \$10,000</b>	3	3		5	10
<b>No. Farms</b>	15	15		15	15

farms are projected to have small or no NCF deficits by 2020.

In summary, given the FAPRI August 2016 outlook for crop prices, the representative crop farm results indicate a significant number of farmers who had 20% D/A in 2014 will not be able to fully repay their operating loans in 2016. Sixty-eight percent of the farms have greater than a 50% chance of a NCF in 2020 assuming a 20% D/A in 2014. The situation does not improve greatly through 2020, with 63% of the farms projected to have more than a 50% chance of a cash flow deficit. For farmers who started 2014 with a 40% D/A, the results are significantly worse, with 94% of the farms having more than a 50% chance of a NCF in 2016, and 85% of the farms in 2020 will have more than a 50% chance of a NCF.

The net income adjustment analysis indicates that about a third of the representative farms that had a 20% D/A in 2014 need to increase annual net income more than \$10,000 to avoid a NCF in 2020. Seventy percent of the farms with 40% D/A in 2014 need to increase annual net income more than \$10,000 to avoid a NCF in 2020.

Debt to asset ratios in 2014 and how farmers managed their cash reserves in 2014 and 2015 directly affect the belt tightening/income increasing requirements to avoid NCF in 2016-2020. What can help this situation? Higher crop prices, lower costs of production, and, where possible, lower land rent. Farmers who cash rent cropland may see lower rents over time, but land owners will be hesitant to reduce rents, as the rents often are used as the main source of income for retired farmers.

# The Outlook for ARC-CO and PLC Payments

James W. Richardson, Joe L. Outlaw, and J. Marc Raulston

The purpose of this paper is to project the cashflows for The 2014 Farm Bill offered grain and oilseed farmers an option to elect Agriculture Risk Coverage-County (ARC-CO), Agriculture Risk Coverage-Individual (ARC-IC), or Price Loss Coverage (PLC) for base acres of covered commodities for the duration of the bill. The majority of corn and soybean farmers elected ARC-CO, while nearly all rice and peanut farms elected PLC (Table 1). Wheat and sorghum farms were split between ARC-CO and PLC.

The ARC-CO program offered higher payments for corn and soybeans in the early years of a declining price market but lower payments in subsequent years if prices remained low. Also, ARC-CO payments were dependent on the five-year moving average county yield, thus, if the yield trend persists, increased yields tend to offset lower prices in the ARC-CO formula.

The purpose of this paper is to provide a discussion of ARC-CO and PLC payment expectations in 2016-2021. The stochastic August 2016 FAPRI Baseline of crop prices is used to simulate the five-year moving average grain prices over the 2015-2021 period. The county average grain yields for all counties were simulated using empirical probability distributions based on FSA county yields used to calculate ARC-CO payments for 2014. The ARC-CO payment rate for each crop in each county was simulated using the formula specified in the 2014 Farm Bill. Average CCP yields for each crop are available from FSA in each county. These yields were used as a proxy for PLC payment yields in calculating PLC payments for each county. Enrolled ARC-CO and PLC acres are available by crop for each county. Total acres

enrolled in ARC-CO and PLC are summarized in Table 1.

The simulation process calculated ARC-CO and PLC payment rates for 500 possible prices each year, incorporating both national price risk and county yield risks. By incorporating risk, we are able to estimate the probability that payments will be made each year as well as by county for ARC-CO.

Table 2 summarizes risk based projections of the five-year moving average commodity prices used to calculate ARC-CO payments for 2015-2021. The moving average corn price decreases over time due to the lower prices projected in the FAPRI August Baseline. The average annual moving average prices are: \$5.29/bu for the 2010-2014 period, \$4.80 for 2011-2015, \$4.04 for 2012-2016, \$3.81 for 2013-2017, \$3.69 for 2014-2018, and \$3.73 for 2015-2019 (Table 2). Because price risk is a reality, we should be aware that the average has a range on it; for example, the 2013-2017 moving average corn price could range from \$3.06 to \$4.55.

The moving average price projections in Table 2 all exhibit a downward trend due to expectations of continued low market prices for grains. The moving average prices used to calculate ARC-CO payments in 2015-2021 for sorghum and corn decrease about 30% over the period. The decrease for wheat is about 25%; soybeans experience a similar decrease of 26%.

Actual county yields and the five-year moving average of county yields are also factors necessary to calculate ARC-CO payments. The results of including stochastic projections of county yields are included in Table 3, which summarizes the weighted average per acre ARC-CO and PLC payments for 2016-2021 by crop. The per acre ARC-CO payments decrease over the 2016-2021 period for corn, going from

**Table 1. Acres Enrolled in ARC-CO and PLC for the 2014 Farm Bill.**

	Participation in ARC-CO	Participation in PLC
Corn	81,456,972	6,740,890
Sorghum	2,643,385	6,208,285
Barley	977,057	3,738,891
Soybeans	50,362,578	1,977,826
Wheat	33,362,050	28,176,589
Rice	176,692	3,530,403
Peanuts	6,906	1,904,322



**Table 2. Probabilistic Projection of the Five Year Moving Average of Crop Prices Used to Calculate ARC Payments for 2015-2020.**

	2010-2014	2011-2015	2012-2016	2013-2017	2014-2018	2015-2019
<b>Wheat</b>						
Mean	6.7	6.7	6.06	5.5	5.19	5.05
StDev	0	0	0.19	0.39	0.54	0.65
CV	0	0	3.16	7	10.46	12.82
Min	6.7	6.7	5.92	4.62	3.7	3.05
Max	6.7	6.7	6.88	6.79	7.06	7.72
<b>Sorghum</b>						
Mean	5.1	4.77	4	3.75	3.57	3.46
StDev	0	0	0.19	0.26	0.35	0.41
CV	0	0	4.87	6.83	9.74	11.72
Min	5.1	4.77	3.83	3.05	2.54	2.12
Max	5.1	4.77	4.88	4.57	4.87	5.24
<b>Corn</b>						
Mean	5.29	4.8	4.04	3.81	3.69	3.73
StDev	0	0.01	0.21	0.23	0.26	0.35
CV	0	0.26	5.08	6.05	6.94	9.3
Min	5.29	4.79	3.85	3.06	3.01	2.64
Max	5.29	4.91	5.14	4.55	4.72	4.95
<b>Barley</b>						
Mean	5.57	5.58	5.58	5.18	4.91	4.71
StDev	0	0.02	0.1	0.26	0.3	0.39
CV	0	0.42	1.88	5.07	6.16	8.2
Min	5.57	5.57	5.49	4.29	4	3.43
Max	5.57	5.73	6.09	5.81	6.02	5.95
<b>Soybeans</b>						
Mean	12.27	11.87	10.87	9.78	9.26	9.07
StDev	0	0	0.41	0.72	0.71	0.89
CV	0	0	3.81	7.38	7.61	9.8
Min	12.27	11.87	10.45	7.79	6.96	6.1
Max	12.27	11.87	12.5	12.6	12.06	12.15

\$45.90/acre in 2016 to \$8.62/acre in 2021. A similar trend is projected for wheat, sorghum, soybeans, and barley, with wheat and soybeans experiencing the greatest percentage losses of -79% and -72%, respectively. The probability of not receiving ARC-CO payments increases from 2016 to 2021 for all crops (Table 3). For example, the chance of no ARC-CO payments for corn in 2017 is 3% and 25% in 2021 and for soybeans the probability increases from 13% in 2017 to 44% in 2021.

Comparing weighted per acre ARC-CO payments to PLC payments indicates that corn and soybeans would have higher average PLC payments than ARC-CO payments in 2018-2021 (Table 3). Sorghum, wheat, and barley are projected to experience higher per acre PLC payments than ARC-CO payments each year through 2016-2021. However, it is not certain that a PLC payment would be paid each year. For example, the average per acre PLC payment of \$24.37 for corn in 2017 takes into consideration there is a 45%

**Table 3. Projected ARC and PLC Payments Per Acre, Weighted by Enrolled Acres in each County, 2016-2021.**

	ARC 2016	ARC 2017	ARC 2018	ARC 2019	ARC 2020	ARC 2012		PLC 2016	PLC 2017	PLC 2018	PLC 2019	PLC 2020	PLC 2021
	(\$/Acre)												
Corn													
Mean	45.9	33.87	15.04	11.07	9.11	8.62		9.53	24.37	24.47	21.28	21.42	19.74
StDev	3.33	21.74	17.81	15	13.89	14.08		6.7	30.8	35.9	31.9	33.09	31.97
CV	7.25	64.2	118.41	135.5	152.44	163.41		70.33	126.37	146.7	149.9	154.51	161.98
Min	28	0	-	0	-	-		-	-	-	-	-	-
Max	51.87	54.32	56.23	52.08	54.51	54.48		25.83	150.04	150.04	135.85	150.04	145.62
P(Pay=0)	0%	3%	15%	14%	21%	25%		16%	45%	52%	53%	57%	57%
Wheat													
Mean	1.38	16	10.62	6.29	4.2	3.36		14.55	20.03	22.03	19.34	17.27	15.03
StDev	0.05	8.08	8.26	6.96	5.85	5.5		1.38	18.12	22.05	21.92	21.27	19.63
CV	3.55	50.51	77.83	110.61	139.12	163.47		9.47	90.46	100.11	113.35	123.21	130.63
Min	1.19	0.05	0	0	0	0		8.71	0	0	0	0	0
Max	1.5	22.94	23.08	22.56	21.54	25.64		17.55	73.36	73.36	73.36	73.36	73.36
P(Pay=0)	0%	3%	6%	11%	24%	27%		0%	25%	33%	39%	42%	44%
Sorghum													
Mean	9.53	24.37	24.47	21.28	21.42	19.74		29.63	30.87	28.87	27.51	26.47	25.18
StDev	6.7	30.8	35.9	31.9	33.09	31.97		3.73	26.88	28.69	28.32	28.03	27
CV	70.33	126.37	146.7	149.9	154.51	161.98		12.59	87.08	99.38	102.95	105.89	107.24
Min	0	0	0	0	0	0		13.38	0	0	0	0	0
Max	25.83	150.04	150.04	135.85	150.04	145.62		37.05	96.57	96.57	96.57	96.57	96.57
P(Pay=0)	16%	45%	52%	53%	57%	57%		0%	24%	32%	31%	35%	35%
Soybeans													
Mean	3.5	20.83	14.35	8.34	5.65	5.83		14.15	10.75	11.18	9.82	7.97	8.43
StDev	6.25	15.91	14.39	11.48	9.64	10.42		20.38	19.89	19.96	18.91	16.26	17.6
CV	178.64	76.38	100.24	137.55	170.49	178.7		144.04	185.03	178.46	192.5	203.93	208.73
Min	0	0	0	0	0	0		0	0	0	0	0	0
Max	24.56	36.75	38.58	36.86	34.35	37.04		82.27	82.27	82.27	82.27	82.27	82.27
P(Pay=0)	42%	13%	17%	32%	36%	44%		52%	66%	64%	69%	70%	71%
Barley													
Mean	21.22	18.82	18.41	14.56	11.49	9.97		78.94	75.38	71.57	69.97	67.84	36.01
StDev	0.54	7.07	7.67	8.43	8.42	8.47		44.03	48.59	46.84	48.1	47.85	13.79
CV	2.54	37.58	41.69	57.94	73.3	84.95		55.78	64.46	65.46	68.74	70.53	38.29
Min	17.44	0	0	0.02	0	0		0	0	0	0	0	0.58
Max	21.78	22.98	24.96	23.82	24.48	24.5		190.75	190.75	180.23	190.75	187.47	67.38
P(Pay=0)	0%	1%	1%	5%	8%	12%		9%	11%	13%	12%	14%	0%

chance there is no PLC payment that year. The probability of no PLC payments increases over the study period for all crops except barley. Absence of PLC payments indicates that prices exceeded the reference price, indicating more favorable market conditions.

In summary, the outlook through 2021 is for per acre ARC-CO payments to decrease and for per acre PLC payments

to be higher than ARC-CO payments after 2016 or 2017, depending on the commodity. The probability of not receiving PLC payments is not insignificant for corn, wheat, sorghum, and soybeans as prices are projected to increase and exceed reference prices with a greater frequency in the future.

# Reducing Risk through Cooperation

John L. Park

Profitable farming relies on managing risk. Some forms of risk are readily apparent. The physical risks of drought, hail, and other weather events can impact yields and crop quality, and market risks of price volatility directly impact revenues. However, there remain other business risks that indirectly affect farm profitability. Access to markets, services, value-adding activities, and other competitive forces also include risks that need to be managed.

Throughout this article, we will consider the challenges of a cotton farmer, but the implications apply to any commodity.

Consider the challenges facing a cotton farmer. Before planting, past prices have enticed other farmers to freely enter the cotton market causing excess supply that lowers the price of cotton in the near future. Because seed, chemicals, and fertilizer are purchased from a relatively small number of large companies, increased costs can be passed on to the farmer by charging higher prices. As harvest begins, thunderstorms threaten to decrease cotton yields and the quality of cotton modules waiting to be ginned. Cotton bales are sold to relatively few merchants who are better able to negotiate prices that maintain their profit margins. Consumers do not buy raw cotton, but rather demand finished products, like blue jeans, whose prices are determined by perceptions of value.

These forces and more create pressures that will negatively impact the profit of our cotton farmer. We can summarize our story as five basic factors that affect the farmer's profitability throughout the supply chain:

1. ability to reduce input costs
2. access to markets and services
3. minimization of potential risks to value or property
4. control over commodity prices
5. amount of participation in value-adding activities.

The overall solution to higher profits can be simple. Farm profit will improve as producers are able to lower costs paid, increase prices received, or both. The problem is that specific solutions to these challenges are impossible for an individual producer to overcome. Owning a cotton

gin would guarantee an access to needed market services, but would cost hundreds of millions of dollars to build and operate. It also might require a far greater volume than one producer can provide in order to operate profitably. Purchasing inputs in larger amounts can lower prices and reduce handling costs per unit, but would require more volume and storage capacity than one producer can provide. Processing cotton fiber into yarn and textiles will provide a greater return per pound, but requires not only expensive factories, but managerial talent to run it, not to mention marketing and sales personnel required to reach consumers.

Therefore, in terms of farmer profitability, one of the greatest challenges to the cotton farmer is that consumers don't buy cotton lint or cottonseed. They buy cotton in the form of t-shirts, blue jeans, and athletic wear. They buy cottonseed in the form of cooking oil and potato chips and a meal at a restaurant. They buy cotton and cottonseed bundled with convenience, prestige, and other qualities that bring them happiness. In short, farmers produce commodities, but consumers buy products. The marketing system transforms commodities into products and delivers them to consumers in the form, location, and time they demand. If you compare the price per pound of cotton lint received by a farmer to the price of a shirt or a pair of blue jeans, it is clear that there is a lot of economic value added to cotton beyond the farm. Consider the price of cotton lint, which is currently around \$0.70 per pound, and compare it to the price of designer jeans that can cost as much as \$150.00 each. The value of a few pounds of cotton is greatly increased by the marketing system. Limited to their own operations, farmers would be unable to capture value from this chain of economic activity.

In that sense, the market has failed to provide producers of commodities what they need to be as competitive and profitable as they would like. Any business facing such a competitive condition has four solutions for improvement:

1. be the lowest cost provider
2. find ways to add value to your output

**Table 1. Cotton Value Chain Ownership.**

	Cotton Value Chain Ownership						
	Supply	Production	Ginning	Storage	Shipping	Textile and Oil Production	Wholesale and Retail
Farm Supply Cooperative	X						X
Farm		X					
Cooperative Cotton Gin			X				
Cooperative Compress				X	X		
Cooperative Oil Mill						X	X
Cooperative Marketing						X	X

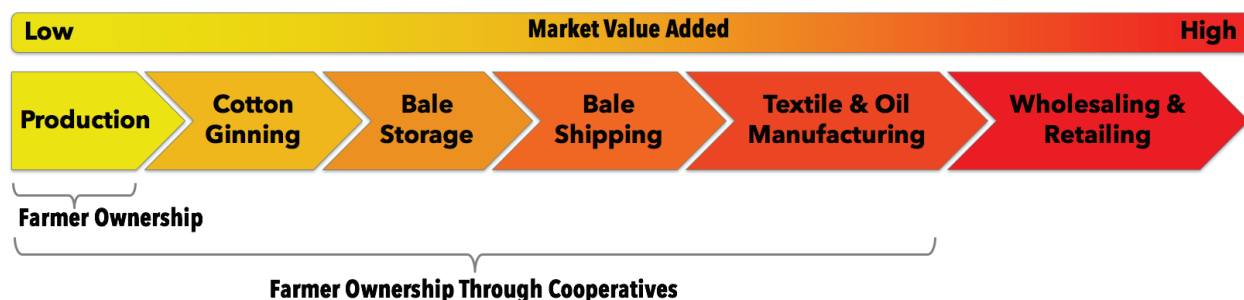
3. focus on the needs of the buyer
4. control prices.

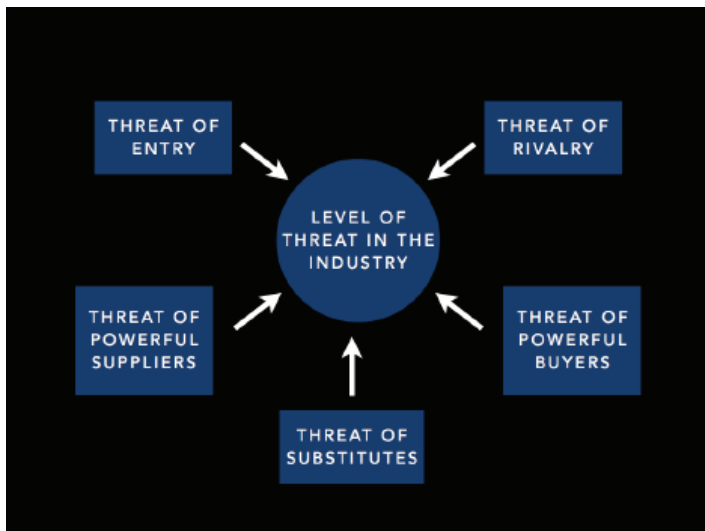
These solutions are achievable through cooperative business ownership. In general, a cooperative is a business that is owned and controlled by the people who use it. Commonly, owners share in the profits according to how much they patronized the business. For example, a customer-owner who provides 10% of the cooperative's revenues would receive 10% of declared profits. Profits are generally shared partially as cash, and partially as equity to be redeemed at a later date. In this way, participation in the cooperative generates a cash return that adds to the producer's bottom line, and ownership of a business in the producer's value chain. As long as equity is redeemed at face value over time, current users maintain ownership and control of the business.

As a side note there is an alternative to this traditional form of cooperation known as a new generation cooperative. Instead of relying on voluntary patronage of producers to generate equity, a new generation cooperative sells shares of ownership up front. Ownership of these shares also includes a contracted obligation to deliver a certain amount of business to the cooperative. The advantages of this less common form of cooperative is that the business has contracted the proper amount of volume

in order to be profitable with an adequate and permanent equity base. This is especially important for businesses that manufacture products whose consumers expect a steady supply throughout the year (imagine a flour mill trying to grow their market share among bakeries when they have an abundant supply one year and none the next). In this way, a small group of large producers may jointly own a facility to process their crops into a valuable product. As the value of this business grows, so too does the value of their individual shares, which can be sold if a member desires to exit the cooperative.

Returning to our example, we can see that a cotton farmer may benefit from ownership of several cooperatives (Table 1). Seed, fertilizer, and other supplies might be purchased from a farm supply cooperative. As cotton is harvested, cotton modules are delivered to a cooperative gin for processing. From the gin, cotton seed is taken to a cooperative oil mill, and cotton bales are delivered to a cooperative compress (warehouse). A marketing cooperative can provide farmers access to a marketing pool, facilitate sales to merchandisers, and provide important business services for cooperative cotton gins. Participation in these cooperatives provides the producer with a greater amount of ownership of the value chain (Figure 1). That ownership can include greater profitability that can offset years of low farm income, or provide a buffer against price variability.

**Figure 1. Farmer Ownership in the Cotton Value Chain.**



**Figure 2.**

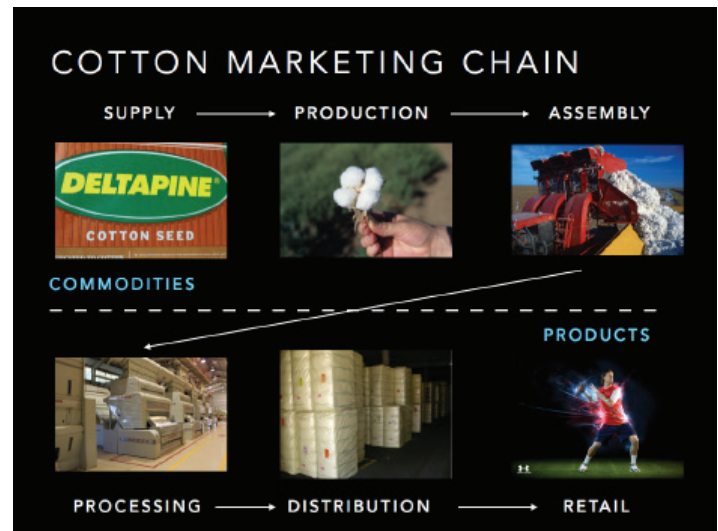
You might even consider that a farmer’s participation in cooperatives represents an investment in the infrastructure of our agricultural marketing system. Without this investment, would these market services and products be provided? Probably, but not in all market locations, and not under all market conditions. When these assets are cooperatively owned by farmers, there is a greater likelihood that services will be available in a bad crop year, and that profits will be shared in a good crop year. In short, cooperatives help farmers to manage the pressures that diminish profitability and bring greater prosperity to farms and communities.

This represents Porter’s Five Forces model, which shows the types of threats that reduce business profitability. From this we can say there are five basic factors that affect the farmer’s profitability throughout the supply chain:

1. ability to reduce input costs
2. access to markets and services

COTTON VALUE CHAIN	
ITEM	CENTS PER POUND
LINT	80
YARN	110
DENIM	450
DESIGNER JEANS	2,500 - 5,000

**Figure 4.**



**Figure 3.**

3. minimization of potential risks to value or property
4. control over commodity prices
5. amount of participation in value-adding activities (Figure 2).

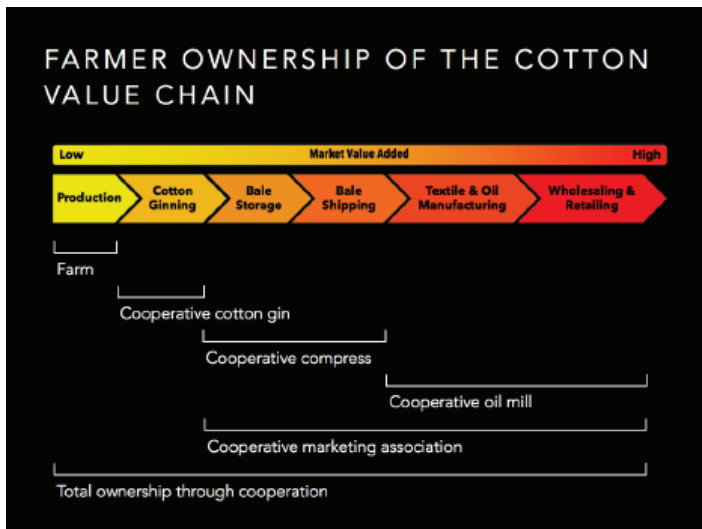
This is the cotton marketing chain, or value chain. Regardless of the businesses involved, commodities will go through these basic functions of marketing before reaching consumers as products. Farmers sometimes complain about the “middle man” getting all the money, but these businesses are adding value that consumers are willing to pay for (Figure 3).

A demonstration of the value that is added to cotton as it goes to consumers. Remember that by the time cotton has reached the consumer in the form of clothing, it has gone around the world, been transformed into various products, and delivered to the consumer in a convenient time and location in a desirable form. The closer we get to

COMPETITIVE SOLUTIONS FOR WHEN THE MARKET FAILS YOU	
1.	Be the lowest cost provider
2.	Find ways to add value to your output
3.	Focus on needs of your buyer
4.	Control prices

**Figure 5.**





**Figure 6.**

the consumer, the more these firms need to advertise and brand their output in order to compete against one another (Figure 4).

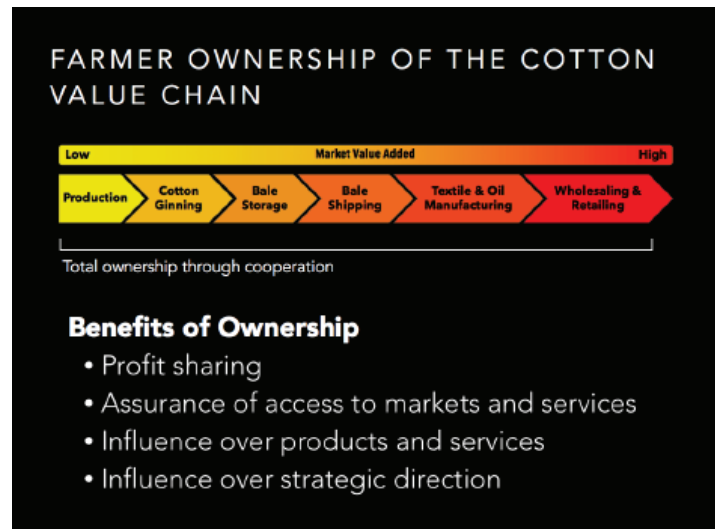
Four general solutions for any firm:

- Being the low cost producer is a constant battle for all farmers. Those who can't keep their costs below their total revenue will eventually shut down.
- Adding value to output is advantageous when the added revenues outweigh the added costs of the activity. Why can't an individual farmer build their own cotton gin? They can but it would be expensive to build and operate, and most likely they won't have enough cotton to be profitable in ginning.
- Focusing on the needs of the buyer requires a different mentality than production. It requires sales, advertising, and marketing expertise.
- Collusion among firms to set price is illegal, but collective bargaining and marketing of commodities by farmers is legal through cooperation.

All these solutions are made possible for an individual farmer through cooperatives (Figure 5)

Consider the entire value chain from growing cotton in the field to finished goods in the store.

A farmer maintains ownership of cotton production but can also own other parts of the value chain through membership in cooperatives.



**Figure 7.**

The following are examples, but not endorsements:

- Meadow Farmers Co-op Gin provides tarps, hauls cotton modules, gins cotton, bags, ties, and sends bales to the cotton compress. They catch the cottonseed and send it to an oil mill.
- Farmers Cooperative Compress stores cotton bales and ships them once they are sold.
- PYCO mills cottonseed into oil and manufactures oil products as food ingredients. They remove additional lint from the seed and sends it to other manufacturers for use in products like cosmetics, mattresses, and film.
- PCCA provides gins with administrative services, stores and ships cotton bales, and help producers sell their cotton. They have historically been involved in the production of denim and textiles (Figure 6).

Ownership of these businesses has the obvious benefit of added revenue from declared profits. Some might argue that they receive better prices at the gin and therefore don't need ownership. However, this may be shortsighted for a couple reasons. First, prices are not always so easily compared. What is included in the price of ginning? Are there other fees? Also, a good deal this year has no assurance for future seasons. Second, cotton must be ginned to have any marketable value, so there is value in having a business that is committed to taking your cotton. There is greater security in having some control over these businesses so you have some assurance that their interests are aligned with your needs (Figure 7).

# Opportunities for Expansion in a Downturn

George M. Knappek

An inevitable outcome of any downturn in the agricultural economy is producers experiencing financial stress. The present low price environment is no different, and with it comes the likelihood that producers will evaluate their options including exiting the industry. The reasons for exiting farming are numerous. Often producers are attempting to capture the remaining equity in their operation before its potential erosion. Certainly, no one likes to bask in someone else's hardship. However, one person's misfortune can be another's opportunity. A valid question for a financially stable and well-positioned producer is should they acquire the assets, particularly the land, of exiting producers?

There are multiple ways of taking on additional land including: leasing, purchase, FSA land contract guarantees, merger, and collaboration. This paper will focus on the purchase option with consideration toward leasing. For more information on merging and collaborating see (Knappek and Klinefelter).

The questions of purchasing an existing neighbor's land or other parts of their operation is essentially one of should you expand your current farm at what potentially could be a one-time opportunity at a discounted value. This question is more complex than it appears on the surface and leads to a number of things to consider both financial and otherwise. The first thing to figure out is, what exactly you will be acquiring. This sounds obvious, but the details matter. Just like you would never buy a house without a detailed inspection and you should never purchase farmland, even from a trusted neighbor, without first knowing exactly what you are purchasing and the condition.

A few things to consider concerning a new land purchase:

1. Has the property been surveyed? Are all boundaries and easements known? A modern GPS survey will almost certainly uncover minor discrepancies which will fall into the realm of common law. If there are any major disputes or claims, determine their legal status. Certainly, you don't want to have

any surprises with physical elements of the land after you become the owner.

2. What are the base acres and payment yields associated with the land? Additionally, it is important to know what farm program (ARC or PLC) the base acres are currently enrolled.
3. What is the soil type and how productive has the land been in the past? Poor or neglected soil can take years to correct. If possible, get soil samples and request production records from the current producer. This information will help you estimate potential yields on the potential purchased land. Remember it may take a while to figure out how to farm the land at maximum efficiency.
4. Are there any drainage or flooding problems on the land? Are there places on the land that stay wet, or parts that suffer from water erosion? If issues exist, can they be addressed and at what cost?
5. Is there access to water and irrigation with the property? If there is no water on the property, is it possible to drill wells? Who owns the water rights? Irrigation is essential in some parts of the country, but is also becoming an important risk management tool against drought in places that receive adequate, but perhaps, untimely rains.
6. Who owns the mineral rights? It is important to know if the mineral rights are being included with the potential sale of the land and what your rights are if they are not.
7. Are there any current environmental concerns or conservation or land use easements of any kind? Not only should you consider the hazards such as spills, but also think about endangered species, special habitats, wet lands, and water regulations that apply to the land.
8. Who will be your new neighbors? Usually, this isn't a big issue, but you want to make sure that your potential neighbors are good stewards and honor the boundaries. Inquire if residential or commercial development is scheduled nearby

in the foreseeable future. It is also important to know about any informal arrangements the current property owner has with the neighbors. Many a new property owner has found out after the sale that a neighbor frequently hunts on the land, has turned out cattle on the property, or used the property for access to their land for decades. The sooner these prior arrangements are addressed, the better to avoid any conflict.

The previous is not a complete list, but these are important questions to have answered before moving forward with an offer.

After you have figured out exactly what you would be acquiring, the second question, is should you actually make this acquisition. Too often you hear of producers making an acquisition because they were afraid to miss a rare opportunity to purchase land that they never thought would be available. Certainly there is merit to taking advantage of limited opportunities, but make sure to do your homework. Before we get to the dollars and cents of the matter, remember there is more to consider than just money. It is helpful to think of the pros and cons of the addition, along with the new land's strategic fit into your existing operation. A small parcel of land that is nearby your existing operation will likely be fairly easily tucked into your current farming operation. However, larger parcels or entire purchases of other operations require more thoughtful consideration as to how your operation will change. Perhaps the essence of what one should consider when purchasing land is: how does the purchase affect my current operation going forward? Hopefully the answer is that it will make your farm more efficient and profitable which will be covered in the next section, but a few questions to answer about how the land will fit into your current operation include:

1. Will you have to take on additional or larger equipment to handle the new size or will your current machinery be sufficient? Perhaps the operator selling has equipment that is for sale that would fill this potential need? Your current operation may be efficiently optimized for its size. Adding land may be awkward both physically and managerially.
2. Will the added land require more labor? This is a particularly important question since qualified labor is becoming more valuable and scarce. As equipment gets more technologically advanced and expensive, farmers need more experienced

and trusted workers than in the past to run the machinery.

3. Does the current manager want the added responsibility and work? If the added land calls for more workers, then the farm is responsible for another's livelihood and well being. Additionally, larger farm size could mean more time for planting, harvesting, etc. The land purchase may require a lifestyle change or adjustment. Schedules that have been routine may change significantly. Is the purchaser willing to take that step?
4. Is the manager capable of handling the added work and responsibility? This is a hard question to answer. It requires knowing what one's capabilities and limits are.
5. What is your timeframe to retirement? If a producer is near retirement, they might not want to take on expansion as fully implementing the land into the operation may take some time and effort.
6. Do you want to have the additional land in your retirement years and be a landlord or sell the property?
7. What kind of health are you in? Obviously, one would like to be in good physical condition when expanding your operation. A quick visit to the doctor would be a good idea if it has been a while since the last check-up.

To this point, this entire paper has been written with almost no mention of financial cost or benefit. Now that we have covered the non-cash aspects of the transaction, let's look at the financial portion of the equation. Financial considerations to make note of are:

1. What is the asking price? In most financial hardship sales, the selling price is usually discounted, but it is always good to check what comparable land has been selling for to compare.
2. What is the cost? Not only are we talking about the cost to purchase the land, but remember there are costs of ownership as well. Things like property taxes and utilities. Remember to also include any costs to bring the land up to your standards such as erosion control, installing drainage, or irrigation. Will you need to purchase more or larger equipment? New equipment may increase efficiency, but beware of total cash outlay involved with the expansion.
3. How will the land be purchased and how much cash will be used? Be aware of how much cash

is needed. If all available cash is used for the purchase, there will be no cushion if unforeseen expenses arise.

4. Will financing be needed? If the necessary cash is not available, or it is decided that it is not best to purchase the land with cash outright, are you able to obtain financing and at what terms? Interest rates are still at very low levels historically, but on large notes a small difference in rates can add up to significant money.
5. How will the purchase affect future cash flow? We may have buried the lead here by including this point so far down in the article, but cash flow is critical in any business. The purchased land should enhance your cash flow after it is paid in full and you need to prepare a *pro-forma* cash flow statement for your business to make sure you can handle cash needs while paying off the loan. You can find examples of cash flow statements from your extension specialist.
6. How is the loan going to be repaid and is there a backup plan if things don't go as planned? Are other assets available for liquidation to make payments if the farm doesn't generate enough cash flow to make the land payments? Is it feasible to subsidize the loan repayment from sources outside the farm?
7. How will the land help overall profitability? The new parcel should benefit the farm operations overall profitability. The first thing most folks think of with expansion is economies of scale or how the new land allows you to better utilize your current assets more efficiently. Economically, efficiency comes from spreading your fixed costs over more acres. Having to add more equipment to service the new land could potentially decrease these gains. Efficiency from scale can also come from volume discounts. Will your added size allow for better prices from input suppliers and output handlers? Checking with local input suppliers for potential cost savings is key. Performing Net Present Value and IRR analysis will help determine if the land in the end will return an economic profit.

What if you can't afford to purchase the land? There are other options to bring the land into your operation. A couple of ways to add scale in absence of purchasing the land yourself which are becoming more popular, are mergers and collaborations. A more common and well know method is to lease the land. Leasing has its positives and negatives which will be explored.

Certainly one of the biggest advantages of leasing versus purchasing is not tying up large sums of capital in land so it can be used for other purposes. Furthermore, leases are unusually short-term in nature (1 to 5 years) which allows an operator to adjust size and location of the farm by ending one lease and potentially adding another. Additionally, the short-term nature of leases makes them more flexible than a mortgage, and they can be renegotiated to current conditions upon each renewal.

The short-term nature of leases which has benefits can also be a negative. At almost any renewal, the lease can be terminated by the owner. This adds a level of uncertainty to the farming operation that isn't there with the purchase option.

The decision to purchase additional farmland is a complicated one and depends on many factors. Fully exploring these issues before making a purchase helps to ensure that the new land makes the entire operation more profitable and can eliminate some potential pitfalls from occurring after the deed changes hands.

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# Collaborative Farming

George M. Knappek and Danny A. Klinefelter

Collaborative farming is an idea as old as agriculture itself. While barn raisings and shared harvests went out of vogue in the early 20th Century, the concept is still very valid today. The current low price cycle may encourage neighbors to share assets and/or expertise in a mutually beneficial way. Producers in good financial condition may be looking for ways to expand, while those who are struggling might be seeking ways to improve their operations to sustain themselves for the long-term. Collaborative farming, though not a silver bullet for financially stressed operations, can be a way for two or more producers to find benefits from combining assets and talents.

First it is necessary to outline what exactly collaborative farming is. The Merriam-Webster dictionary defines “collaborate” as “to work with another person or group in order to achieve or do something.” That sounds simple enough, but what form does that take in farming? The truth is there is no magic formula on how to collaborate with others, meaning that collaborating can take different forms from setting up a buying club to full partnerships. Those are just two examples of how producers can collaborate, but there are many others including marketing groups, setting up an equipment sharing entity, or a full blown operating entity that custom farms the land of the partners. It is up to the collaborators to decide the level of involvement and set the rules that work for them.

While collaborating can take on many forms, there are some things that are needed to make it, or any business partnership, successful. For collaborations to work, all parties must have a common vision, be compatible, and perhaps most importantly, trust each other. All parties must count on each other to be honest and uphold their end of the arrangement. Transparency and accountability are key and will help eliminate doubt which assists in building trust over time. Good communication and record keeping help to hold everyone accountable. However, accountability goes farther than keeping track of hours using a sprayer. It also means letting your team members know when you have screwed up, and doing so in a timely fashion.

Klinefelter (2016) and Williams (2016) identified the benefits of collaborative farming. Many of these benefits

came from direct observations of farmers currently involved in collaborative arrangements. They are:

1. **Expansion of acres.** Collaborating can be a way of taking on more farmland without tying up so much capital or taking on debt to acquire additional land. Perhaps you have a neighbor who is looking to slow down or needs to get more efficient. Maybe arrangements of swapping labor for land are possible.
2. **Helping farmers to retire.** Presently, the average age of US farmers is 58 years (USDA). Consequently, many farmers are nearing retirement. These farmers may want to ease into retirement or need to slow down a bit, but not completely quit farming. Partnering with someone who is younger may allow older producers to farm until they are ready to retire or semi-retire. For example, the older farmer can work seasonally during crunch periods so the operation doesn't have to hire a person they don't know well, and instead, get someone whose knowledge of the farm and work ethic are known. Also, the older farmer may be able to supply valuable experience and serve as a mentor to the younger producer. Additionally, farmers who don't have a successor may be able to see their operation continue after they decide to leave farming. Lastly, a retiring farmer may be able to minimize the tax consequences of liquidation by leasing equipment to partners.
3. **Allow people to do what they do best.** When you are able to do what you do well and enjoy, you are happier and more motivated. Allowing partners to focus on their strong areas while compensating for weaknesses allows for the whole of the organization to be greater than the sum of the parts.
4. **Economies of scale.** Collaborating allows for purchasing and marketing in larger quantities to take advantage of volume discounts. It can also allow an operation to fully utilize its machinery or to upgrade to newer and more efficient technology. Not only can upgrading be possible, but sizing the labor and the technology to the operation.



5. **Boost efficiency.** For each area, there is most efficient set of labor and equipment to match a given set of acres farmed. For example, it maybe most efficient to have two tractors, one combine, two planters, and two workers per 5,000 acres. Adding another 1,000 acres could actually lead to another tractor and worker who are not fully utilized. Collaborating can aid in replicating size efficient units. In this example that would mean creating another separate 5,000 acre operation with the same complement of labor and equipment.
6. **Afford professionals.** If a skill set does not exist, but is needed, a larger entity may be able to acquire these services. For example, experts such as CFO, IT specialists, risk management specialists, or nutritionists may be utilized by the collaborators.
7. **Ease of ownership.** A collaborative farming organization can be set up in a way to allow fractional ownership. This may ease people in entering the organization.
8. **Broaden wisdom.** Interacting with others in the collaboration will allow for different points of view to be expressed. It is important to have a means to express these different ideas and multiple vantage points which aid in innovation and problem solving. This is one reason why having regular meetings and direct communication is valuable in collaborations.
9. **Become more professional.** A collaborative entity can create an atmosphere of competition, but also one of comradery. Like successful sports teams, players learn to depend on one another and don't want to disappoint other team members. Motivation is created to do your best not only for one's own benefit, but to not let others down in the organization.
10. **Spend more time with family or outside interests.** When an operation is just one person, it is hard to do everything. In this case, if the operator is overseeing or doing everything, some things are not going to get done. Having others who can fill in when needed gives members the benefit of being able to find a greater balance outside of work.

The list of benefits certainly seems enticing. However, some who start in collaborations never see the benefits because the arrangement fails for some reason. Often failure is just as simple as the producers not being like-minded in their goals or not having the same core values. Also, perhaps the most important aspect of a successful

collaboration, is meshing personal styles and emotions. Even if the collaboration works on paper, if the people involved clash the numbers don't matter. Thus, taking advice from those who have collaborated successfully is useful in being able to avoid the pitfalls in the process. The following, echoing the work of Williams (2016), is advice from people who have and are currently successfully collaborating:

1. **Grow slowly.** Many who collaborated agree that it is best to move into the arrangement gradually, and perhaps without a financial commitment at first. This "dating period," which could take a few years, will allow all parties involved a chance to truly get to know each other and determine if they can work together. This introductory period will allow individuals to see if the fit is there in both good times and trying situations.
2. **Transparency and fairness.** As previously mentioned, transparency is critical, and to be fully transparent requires good record keeping. For example, when sharing equipment, it is important to know exactly how many hours each piece of equipment was used. Also, no special deals should be allowed. Everyone should have to pay the same rates, or else resentment could become an issue.
3. **Be careful how the operation is governed.** It is important to set the rules for how decisions will be made. Will each partner have an equal vote, or will voting rights be weighted in some manner? Some have found it very valuable to have an outside and independent voting member. This affords the group a voice that might identify issues that those involved with the organization may miss. Consequently, the independent person can also keep the group focused on the collaboration's goals. The outside person should be a successful business person that the entire group respects. Examples could include: another business oriented farmer from another area, a farm business consultant, a retired lending executive, or a lender with no ties to collaboration which is important to avoid conflict of interest.
4. **Guard against inefficiencies.** When operations get larger and experience some success, complacency can set in a bit. Some things can slip through the cracks if the organization is not diligent. This is where good records and an independent voice can have a big impact.

5. **Be aware of your image.** When you get larger than most of the farmers in your area you face added scrutiny. Think of it as the “McDonald’s syndrome.” Large companies often times take the brunt of criticism from interest groups while smaller companies have similar products and policies stay under the radar. The producers in a large collaborative organization often find it useful to be actively involved in the local community and charitable events.
6. **Value your relationships.** The relationships outside the collaboration can be almost as important as those within the business. Having a good working relationship with input suppliers and output handlers is a big asset.
7. **Work as a team.** As mentioned previously, working as a team where everyone is accountable and fills a valuable roll is critical to collaborative arrangements. One individual not fulfilling their duties can bring the organization down.

While not the focus of this paper, one still needs to pay attention to personal liability. While entering into a collaborative agreement there are things that can be done to limit personal liability. This list is not exhaustive and you should consult your lawyer before entering into any business agreement. Many liability issues can be partially addressed by the form of business organization chosen, proper insurance, avoiding signing unlimited personal guarantees on debt, and having comprehensive buy/sell agreements in place between all parties.

Collaborating is not for everyone, and is certainly not a cure all for those in serious financial trouble. However, for those who find the right fit, it can be financially and inherently beneficial to all parties involved.

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# Preventing Farm-related Stress, Depression, Substance Abuse, and Suicide

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Financial stressors combined with family-farming relationships that blur the line between business and personal lives create unique sources of stress for farmers and farm families. If not addressed, these stressors can lead to physical illness, depression, substance abuse, and suicide. Farmers are more than five times as likely to commit suicide than the general population (McIntosh *et al.* 2016) and are more likely to report substance abuse (Bush and Lipari, 2015).

Stress and depression also increase the already above average probability of accidents and injury (Fetsch, 2012), and stress may affect factors influencing other leading causes of death in rural areas, which include heart disease, chronic lower respiratory disease, and stroke (Moy *et al.*, 2017). Farmers, farm families, and rural communities can help to manage farm-related stress and reduce incidences of depression, substance abuse, and suicides.

## Understanding Farm-related Stress

Stress is the body's physical and psychosocial response to anything that threatens its physical, emotional or financial well-being or survival (Middleton, 1988; AgriSafe Network, no date). Researchers identify farming as more stressful than most other occupations (Fetsch, 2014; Swisher *et al.*, 1998; Jurich and Russell, 1987). Farming is

a demanding profession with many occupational risks. The loss of a job could also imply loss of home. While farmers have many skills, those skills may not be reflected in the formal experience and education required in the job market for other occupations (Jurich and Russell, 1987).

Farmers often live where they work and work with family members, blurring the lines between business and family roles (Fraser *et al.*, 2005). These relationships can provide additional support, but they can also result in additional conflict when family members disagree about business or personal needs and opportunities. Multigenerational farms pose specific stressors, with younger farmers sometimes feeling they have additional financial burdens on the farm and in their families while having less support and less control over the farm relative to the older generation (Weigel, Weigel, and Blundall, 1987). Even outside multi-generational operations, farmers and ranchers worried about losing family land may face extreme guilt leading to anxiety, depression, substance abuse, and/or suicidal thoughts or actions.

Work problems can become family problems and vice versa (Weigel, Weigel, and Blundall, 1987). However, farm families, especially men, are traditionally reluctant to seek help due to a perception of farmers as independent and self-sufficient, social stigma around mental health issues, and a lack of mental health providers in rural areas (Towne, *et al.*, 2016; Fraser *et al.*, 2005; Weigel, 2002; Jurich and Russell, 1987). Many rural men believe that showing emotion or needing help is a sign of weakness (Weigel, 2002). This worldview prompts them to try to avoid reaching out for assistance.

Women, regardless of role on the farm, are more likely than men to experience stress (Reynolds, 2008; Freeman, Schwab, and Jiang, 2008). Women tend to bear stress on multiple fronts as they balance the traditional responsibility of taking care of the family with on- and off-farm jobs. Many women also feel they lack a say in the farm operation, with daughters-in-law reporting the highest levels of stress

### Farm Occupation Risks

- Isolation
- Stressful work environments
  - long hours
  - weather conditions
  - lack of control over costs and prices
  - machinery breakdowns
- Work-home imbalance
- Potential for financial losses
- Possible neurological effects of chronic exposure to pesticides

in multi-generational farm families (Marotz-Baden and Mattheis 1994; Weigel and Weigel 1987; Russell *et al.* 1985).

Children are not immune to farm stressors. Farm children often work on the farm and identify closely with rural values (Fraser *et al.*, 2005; Jackman, Fetsch, and Dalsted, 2015). A study of Kansas farm families found that many parents were unwilling to talk with their children about the family's financial situation, which increased children's uncertainty and stress (Jurich and Russell, 1987). In fact, children tended to blame themselves for economic conditions well beyond their control. Children's stress may manifest as behavioral outcomes (*e.g.*, inappropriate behavior, poor school performance), health-related outcomes (*e.g.*, higher rates of illness), and other unwanted outcomes (*e.g.*, bedwetting) (Fetsch, 2012; Fraser *et al.*, 2005; Jurich and Russell, 1987).

### Recognizing Symptoms of Stress and Depression

Many feelings, behaviors, and physical symptoms may indicate stress or depression (Williams and Fetsch, 2012; Middleton, 1988). Prolonged stress is associated with physical health risks, including hypertension and ulcers. Stress is also related to anxiety and depression. Symptoms of anxiety disorders, which range from feelings of uneasiness to immobilizing terror, include fear, worry, apprehension, and feelings of dread (SAMHSA, 2003; AgriSafe Network, no date). Untreated anxiety can lead to depression and substance abuse, which are associated with higher suicide risk.

Depression affects the brain's biochemical balance and can be diagnosed when multiple symptoms are present for

more than two weeks. Signs of depression include physical symptoms similar to those experienced with stress and feelings such as sadness, reduced activity or pleasure, and guilt. Friends and neighbors may notice behavioral changes such as missing church, declining maintenance or care for the farmstead, or distressed family members, including children (Williams and Fetsch, 2012). See the Resources section for more information about symptoms of stress and depression, including a checklist of symptoms and guide for referrals from Colorado State University Extension.

### Signs of Alcohol and Drug Abuse

The National Institute on Drug Abuse (2016) defines addiction as "a chronic disease characterized by drug seeking and use that is compulsive, or difficult to control, despite harmful consequences." In a SAMSHA study, 10.5 percent of workers engaged in agriculture, forestry, fishing and hunting reported a substance abuse disorder (dependence on or abuse of alcohol or illicit drugs), higher than the overall rate of 9.5 percent. Furthermore, the incidence of illicit drug use and substance abuse disorders rose from the 2003-2007 timeframe while heavy drinking fell, although natural resource workers were still more likely than the general population to report heavy drinking. Misuse of prescription drugs and illegal substances in rural America has been an increasing concern documented in the popular media as well (Runyan, 2017).

The CAGE (Cut down, Annoyed, Guilty, and Eye-opener) drug and alcohol screening questions (Ewing 1984; Turvey *et al.* 2002; Johns Hopkins, no date) include:

#### Recognizing Stress

Feelings or behaviors:

- tension
- exhaustion
- anxiety or restlessness
- irritability
- drug/alcohol misuse

Physical symptoms:

- headaches or dizziness
- changes in appetite
- upset stomach
- diarrhea
- backaches

Managerial changes:

- ineffective management
- reduced productivity

#### Symptoms of Depression

- Sadness, discouragement, or hopelessness
- Reduced activity and pleasure
- Withdrawal or feelings of isolation
- Guilt
- Reduced self-esteem
- Physical symptoms as with stress

#### Outward Signs of Depression

- Changed routines (*e.g.*, avoiding the coffee shop)
- Sad or unkempt appearance
- Reduced care of livestock or farmstead
- Increased accidents resulting from fatigue or inattention
- Distressed family members, including children

1. Have you ever felt you ought to cut down on your drinking or drug use?
2. Have people annoyed you by criticizing your drinking or drug use?
3. Have you felt bad or guilty about your drinking or drug use?
4. Have you ever had a drink or used drugs first thing in the morning to steady your nerves or to get rid of a hangover (eye-opener)?

Answering “yes” to at least two questions is often considered an indication of alcohol and/or drug abuse problems, but a single positive answer may also be cause for concern (Johns Hopkins, no date).

### Suicide Prevention

A 2016 CDC report found that the suicide rate was higher among people employed in farming, fishing, and forestry than in any other occupation (McIntosh *et al.*, 2016). The report analyzing 2012 suicides found a rate of 84.5 suicides per 100,000 population among agriculture and natural resources workers (90.5 for men). The second highest suicide rate was among construction and extraction (*e.g.*, oil field) workers at a rate of 53.3. The overall suicide rate was 16.1 per 100,000 population in 2012, the year of the occupational data. Other data indicate that U.S. suicide rates are increasing since 1999 (Curtin, Warner, and Hedegaard, 2016). While the risk of a friend committing suicide may seem relatively low, it’s estimated between 10 and 20 percent of people in the U.S. think about suicide at some time in their lives (Weissman *et al.*, 1999). In other words, one or two of your 10 closest friends may consider suicide at some point.

The negative thoughts associated with stress and depression can be changed. Often a suicide attempt provides a clear alarm for the individual and those around them that something must change quickly. However, suicide attempts using highly lethal means such as firearms frequently result in an irreversible outcome. Booth, Briscoe, and Powell (2000) state that farmers with suicidal intent may be at increased risk of dying as a result of ready access to firearms.

Warning signs for suicide often mirror symptoms of stress, anxiety, and depression. In fact, anxiety, depression, withdrawal from friends and activities, and alcohol abuse are often associated with suicidal thoughts (Williams and Fetsch, 2012; AgriSafe Network, no date). Family and community members may also observe behaviors such as making a will or final arrangements or giving away possessions. Previous attempts and a history of family members of friends committing suicide are associated with greater risk of suicide.

Frequent thoughts of suicide with a plan in mind is cause for concern. If someone talks of suicide, makes comments hinting at suicide, suggests that people would be better off without him/her, or exhibits other warning signs, ask that person if they are considering suicide.

People struggling with stress, depression, or suicidal thoughts may think their feelings are too much to burden someone else with. When you ask directly about their mental health and intentions, you are telling them it is not too much and that you care about them. Asking a person if they are contemplating suicide has not been shown to cause the person to consider suicide if they weren’t already. And if someone is already considering suicide, asking them about their thoughts about taking their life has not been shown to make the person more likely to make an attempt. Talk to them privately and

#### Signs of Alcohol and Drug Abuse

- Drinking more than intended
- Being unable to stop or cut down on drinking
- Drinking more to get the same effect
- Finding that the usual number of drinks doesn’t have the same effect
- Getting into risky situations after drinking
- Trouble with family or friends stemming from drinking
- Drinking or hangovers interfering with work or other activities

(National Institute on Alcohol Abuse and Alcoholism, 2016)

#### Warning Signs for Suicide

- Anxiety
- Depression
- Withdrawal from friends and activities
- Alcohol and/or drug abuse
- Refusing to take or hoarding medication
- Aggressive behavior or irritability
- Making a will or final arrangements
- Giving away possessions
- Talking of or hinting at suicide
- Suggesting people would be better off without him/her
- Frequent thoughts of suicide with a plan in mind



summarize why you are concerned about them, but don't promise secrecy.

The Substance Abuse and Mental Health Services Administration (SAMHSA) recommends the following guidelines to help someone who may be thinking about committing suicide, and these steps are also recommended by Fetsch (2012) in an agricultural context:

- “Ask them if they are thinking about killing themselves.
- Listen without judging and show you care.
- Stay with the person (or make sure the person is in a private, secure place with another caring person) until you can get further help.
- Remove any objects that could be used in a suicide attempt.
- Call SAMHSA's *National Suicide Prevention Lifeline* at 1-800-273-TALK (8255) and follow their guidance.
- If danger for self-harm seems imminent, call 911.” (– SAMHSA Suicide Prevention Website)

## Managing Stress

Many strategies can help farmers and farm families manage stress.

- *Identify sources of stress.* Recognizing the pileup of stressors can provide some measure of control as individuals understand why they are experiencing negative feelings (Fetsch, 2014; Middleton, 1988). Some people find it difficult to admit they are experiencing stress and may need guidance in observing the physical, emotional, and behavioral symptoms of stress. This may be facilitated by seeing a doctor about a medical concern, yet rural residents face gaps in access to many health care providers (especially mental health care providers).
- *Engage social support systems.* Family and social support systems help maintain well-being, allow tasks to be delegated to relieve additional stress, and provide connection to additional resources. Families with greater community involvement and stronger social networks are often more resilient in the face of hardship (Lavee *et al.*, 1985).
- *Use new and existing resources.* Resources help individuals and families to understand and resolve stressful situations (Fetsch, 2014). For example, reaching out to financial (including mediation) or legal experts may help facilitate the resolution of certain economic-related farming concerns.
- Consulting mental health experts can help increase one's ability to cope and make it easier to deal with encountered stressors (Middleton, 1988; Fetsch, 2012). Implementing economic risk management strategies has been shown to help reduce stressors (Jackman, Fetsch, and Dalsted, 2015). Finally, personal resources like self-esteem, self-efficacy, and communication skills are inherent in all of us and can be strengthened to provide an additional buffer against stress (Fetsch, 2014).
- *Reframe stressful situations.* Reinterpreting perceptions of stressful situations can increase the level of control family members feel in dealing with stress and help them see alternative solutions (Xu, 2007; Fetsch, 2014; Jurich and Russell, 1987). It is imperative to avoid self-blame and to find perceptions and meanings that acknowledge positive benefits and opportunities for the family (Fetsch 2012). Working through stressful situations has the potential to improve confidence in one's ability to overcome adversity, heighten one's sense of spirituality and connectedness to something greater than their circumstances, reprioritize what is important, and discover a sense of hope and renewed purpose (Snyder, 1998; Wright, 1983).
- *Stay physically healthy.* Maintaining health through regular physical exercise, a healthy diet, and appropriate sleep patterns also promotes mental health and well-being (Reynolds, 2008; Molgaard and Miller, 2002). Stress management activities, including meditation and breathing exercises, may be relatively easy to implement. It is important to take time to relax. Relaxation exercises can be beneficial both during down-time and when experiencing immediate frustration. Example exercises from the University of Illinois Extension can be found at <http://web.extension.illinois.edu/fmpt/ec/091205.html> and in Farm Family Stress (Middleton, 1988) from the Michigan State Cooperative Extension Service at <http://archive.lib.msu.edu/DMC/Ag.%20Ext.%202007-Chelsie/PDF/e1697-1988-rev1.pdf>. The Breath2Relax app by the National Center for Telehealth and Technology is a smartphone tool to aid relaxation.
- *Make time for fun.* Fun and enjoying life are essential to mental health (Reynolds, 2008). Focusing on interests, hobbies, and family relationships can go a long way to improving one's quality of life. Planning time away from the farm,

where possible, can also provide a meaningful break and a change in scenery. This may serve as an opportunity to enrich social engagement among family and friends in new settings and may serve to lessen potential resentment toward the farm (Middleton, 1988).

- *Identify a shared mission.* Understanding family and business values and goals can help families make strategic decisions, ensure that financial and other resources are directed to the things that matter most, and help family members accept some stressors as bumps on the road to a desired destination (Molgaard and Miller 2002; Middleton, 1988). The family may ask What do we stand for? Where do we want to be in x years? What do we want to pass on to our children or the next generation? What would we like to do in retirement? and What concrete actions can we take to make these things happen?

### **The Rural Community's Role in Supporting Farm Families**

Strong, resilient individuals and families seek help when they need it. Strong rural communities support those in need by guiding them to appropriate resources. Community cohesion and collectiveness have been identified as potential protective factors against rural stress, depression, and suicide (Hirsch and Cukrowicz, 2014; Turvey *et al.*, 2002; Weigel, 2002). Bankers, lawyers, agricultural cooperative employees, doctors, pastors, teachers, and neighbors all play a role in breaking down the stigma around mental health issues, in noticing changes in individuals' attitudes and behaviors, and in suggesting resources.

From an economic perspective, many studies demonstrate the role of financial hardship in rural depression (Freeman, Schwab, and Jiang, 2008; Fraser *et al.*, 2005; Turvey *et al.*, 2002; Scarth *et al.*, 1997). Community-based programs can facilitate discussion of the causes and effects of macroeconomic or industry-specific economic problems to decrease instances of self-blame, shame, isolation, and despair and to build awareness and support for mental health services in the community (Turvey *et al.*, 2002; Hirsch and Cukrowicz, 2014; Towne, *et al.*, 2016). Banks, agricultural cooperatives, or chambers of commerce may be natural hosts to such programs.

Many communities believe that “taking care of each other” is part of rural living. In stressful times, improving quality of life hinges on each individual

taking care of themselves and collectively caring for each other. Everyone can learn to recognize warning signs for stress, anxiety, depression, and suicide and can identify financial, legal, mental health, and other helpful resources in the community or region. It may be difficult to ask someone about his or her feelings, but listening to their concerns and referring them to new resources could save a life.

### **Resources**

National Suicide Prevention Lifeline: 800-273-TALK. 24-hour, toll-free crisis hotline. En Espanol: 888-628-9454. Tele-interpreters are available for over 150 languages using the English language site. <http://www.suicidepreventionlifeline.org/>

SAMHSA's National Helpline (Treatment Referral Routing Service): 1-800-662-HELP (4357). 24-hour free and confidential treatment referral and information about mental and/or substance use disorders, prevention, and recovery in English and Spanish. Website: [www.samhsa.gov/find-help/national-helpline](http://www.samhsa.gov/find-help/national-helpline)

Farm Aid: 800-FARMAID (800-327-6243). Farmer Help Hotline staffed with individuals who understand the pressures of farm life and help farmers connect to financial, legal, and other resources. <https://www.farmaid.org/our-work/family-farmers/help-for-farmers/>

Farm and Ranch Family Stress and Depression: A Checklist and Guide for Making Referrals from Colorado State University (Williams and Fetsch, 2012) provides information about stress and depression symptoms and resources and is available at <http://extension.colostate.edu/disaster-web-sites/farm-and-ranch-family-stress-and-depression-a-checklist-and-guide-for-making-referrals/> or in printable PDF at <http://texashelp.tamu.edu/004-natural/pdfs/2016-01-winter-storm-goliath/Farm-Ranch-Family-Stress-Depression-Checklist-for-Making-Referrals.pdf>.

The Personal Nature of Agriculture series from the University of Wyoming Extension provides a number of resources on stress, crisis, goal setting, and rural perspectives of mental health and is available at <http://www.uwyo.edu/fcs/faculty-staff/weigel/life/personal-nature-agriculture/index.html>

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