

# Farmland Values: Expect a Soft Landing

## AgriThought

AgriBank provides financial solutions to meet the needs of production agriculture in America's heartland. We feature our research and analysis in AgriBank Insights as part of our AgriThought initiative to help inform the financial decisions among those we serve.

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FARMLAND VALUE DATA FROM USDA 2013 LAND VALUE SURVEY.

STATISTICAL ANALYSIS BY AGRIBANK STAFF.

*Farmland values across the United States, including the 15-state AgriBank District, have been on the rise for more than a decade. In extreme examples, highly productive parcels have recently sold for \$15,000 to \$20,000 per acre — quadruple the District average. Do years of rising land prices portend a bubble? If so, when? And how ominous? With commodity prices having fallen and interest rates likely to rise, land values seem inevitably headed back to earth. But more conservative lending practices and other conditions likely would prevent a 1980s-type farm crisis.*

## Highlights

- **CROPLAND VALUES RISING.** The AgriBank District average cropland value increased 14.5 percent in 2013 following a 16 percent increase in 2012 and a 13.9 percent increase in 2011, according to USDA data. The District average cropland value was \$4,548 per acre in 2013.
- **CORN PRICES FALLING.** Many forecasters have shown that, for corn, a return to trend yields in 2013 and beyond would result in season-average prices falling from \$6.50 to \$7 levels seen earlier this year to a long-run average of between \$4 and \$5 per bushel.
- **INTEREST RATES RISING.** The 10-year Treasury rate likely bottomed out at 1.8 percent for all of 2012. In 2013, a forecasting service projects an average of 2.33 percent in its most recent forecast and does not expect the rate to go above 4 percent (a 200+ basis point move) until early 2017.
- **LAND VALUE CORRECTION BREWING.** The drop in season-average corn prices to the near \$4.50 per bushel level combined with a 2 percent increase in interest rates would result in cropland values dropping by about 30 percent to 34 percent, as implied by AgriBank's internal modeling efforts.
- **BORROWERS, LENDERS PREPARING.** Borrowers and lenders alike have learned from past experience. Conservative lending practices and other factors suggest a soft landing in farmland values, not a crash.

# Riding High in the AgriBank District: Cropland Values and Net Farm Income



U.S. average cropland values have moved **steadily upward** since 1987, with the exception of the Great Recession in 2009.

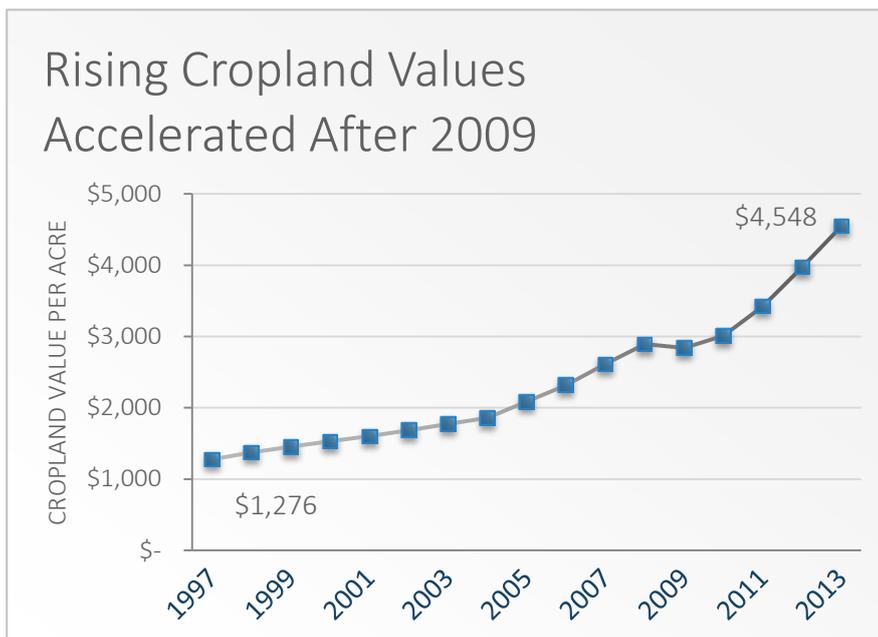
A convergence of many factors in recent years has bestowed blessings on the U.S. agricultural economy. Commodity prices and farm incomes increased, and various monetary actions designed to boost the “weak” national economy produced lifetime low long-term interest rates. These factors helped fuel higher land values. Given natural economic and market cycles, it’s unlikely these favorable conditions for U.S. agriculture will continue. Already, crop prices have fallen, interest rates likely will rise — and land values face a correction. This report demonstrates where we are, where we’re headed and what a drop in land values means for farmers and ranchers across the AgriBank District and the nation.

## Cropland values – steadily upward since the ‘80s

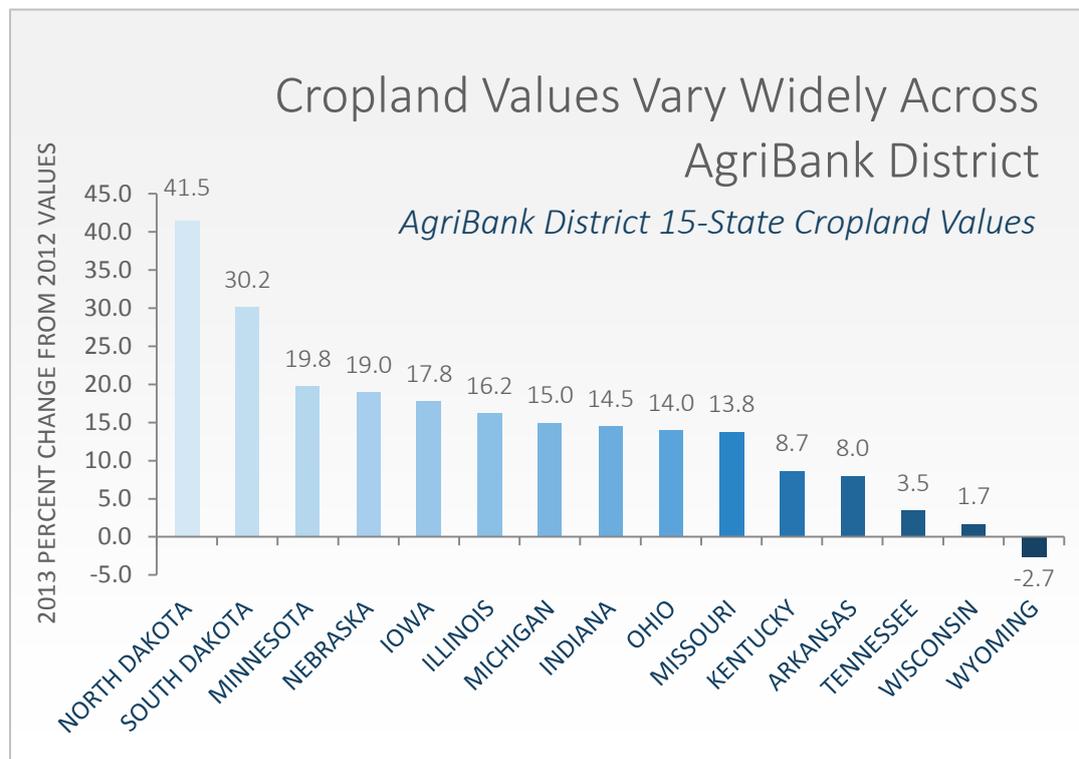
The trend in U.S. average cropland values has been steadily upward since 1987, with the exception of the hiccup during the Great Recession in 2009. Cropland

values across the AgriBank District have mirrored this trend. Since 1997, AgriBank District average cropland values have increased at an annual rate of 8.3 percent.

The rate of increase in cropland values has accelerated since 2009, as shown in the graph to the left. The AgriBank District average cropland value increased 14.5 percent in 2013 following a 16 percent increase in 2012 and a 13.9 percent increase in 2011. By comparison, U.S. cropland values increased an average of 13 percent in 2013. The District average cropland value was \$4,548 per acre in 2013.



Source: USDA 2013 Land Value Survey (simple average of values reported for each state)



Source: USDA 2013 Survey

## Land Data Glossary

While this report highlights cropland values, USDA survey data for farm real estate and pastureland has followed similar trends across the United States and within the AgriBank District.

**CROPLAND** – land used to grow field crops, vegetables, or harvested for hay. Idle cropland and cropland enrolled in government conservation programs is also counted as cropland in the survey.

**FARM REAL ESTATE** – all land and buildings used for agricultural production, including dwellings

**PASTURELAND** – any land normally grazed by livestock

Any land that switches back and forth between cropland and pastureland is valued as cropland.

USDA survey data is typically collected each year in the last half of June.

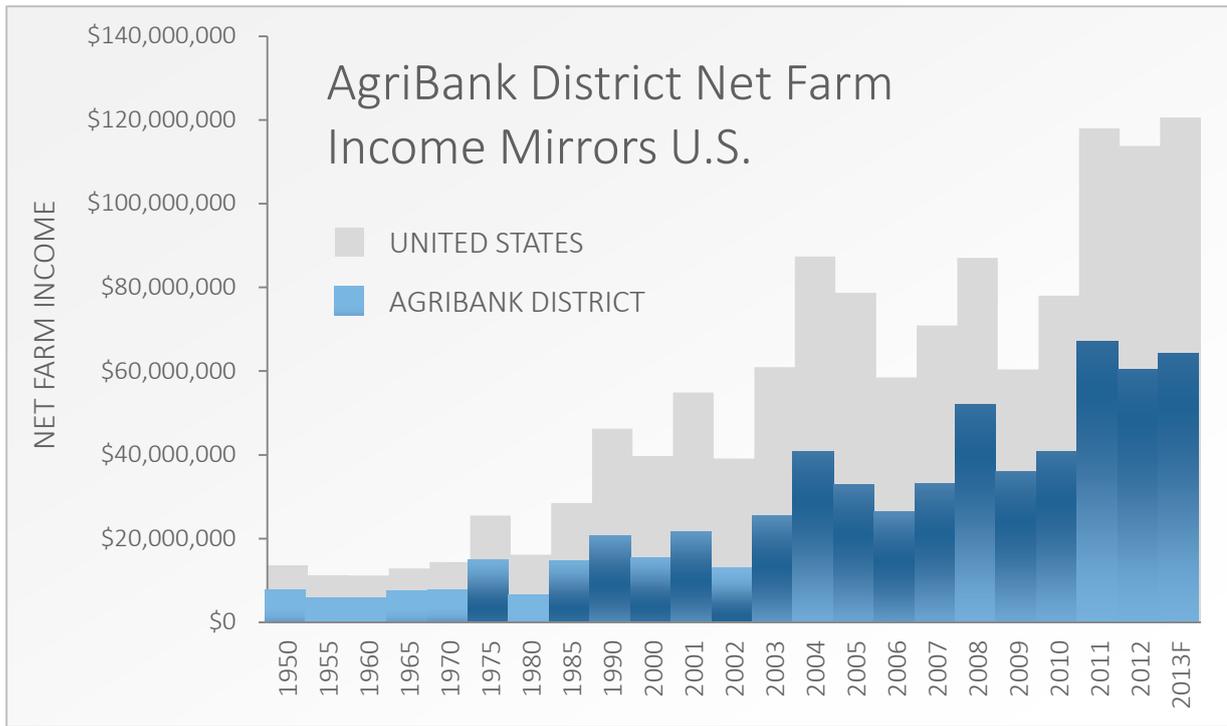
In 2013, North Dakota had a 41.5 percent increase in average cropland value per acre — the largest of any state in the AgriBank District. This is primarily attributable to high farm income, due in part to a shift in crops to corn from other crops, as well as the oil-drilling boom. Followed by North Dakota are South Dakota at 30.2 percent and Minnesota at 19.8 percent. Iowa had the largest per acre value at \$8,600, followed by Illinois at \$7,900 and Indiana at \$7,100.

## Net farm income: highest since the '70s commodity boom

After a slight decline in 2012 net farm income due to higher feed costs for livestock producers from last summer's drought, 2013 USDA forecasts project a 6 percent increase for U.S. net farm income to \$120.6 billion. This would be the highest net farm income in real terms since the height of the 1970s commodity boom and follows well-above average net farm income in the previous two years.

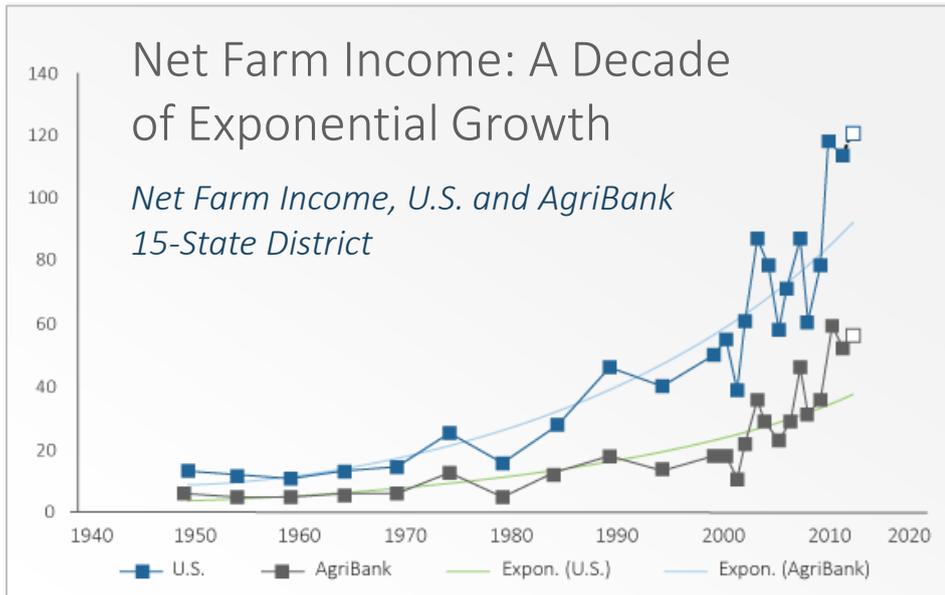
This data comes from the USDA Economic Research Service semi-annual update to the U.S. Farm Income and Wealth Statistics, released Aug. 27, 2013. The release included forecasts for 2013 financial indicators at the national level.





Includes the 15 states in the current AgriBank District. 2013 forecast applies the same 6 percent increase used by USDA-ERS for U.S. projection.

Since 2000, net farm income values for the United States and AgriBank District have tended to move closely together, as shown in the above chart. The August 2013 release does not include a state-by-state forecast for 2013 NFI – only the actual estimated results for 2012. So the AgriBank District forecast represents the same 6 percent increase as the U.S. forecast.



U.S. net farm income increased at an average annualized rate of 3.8 percent from 1950 to 2012, while total net farm income for the 15 states in the current AgriBank District increased at a slightly lower rate of 3.7 percent over the same period. Both the U.S. and AgriBank District results show well-above trend-line values over the past three years (including the 2013 forecasts), as shown in the graph to the left.

Source: USDA-ERS

The AgriBank District percentage share of U.S. net farm income peaked at 52.6 percent in 2008 and was at a 60-year low of 28.4 percent in 2002. This fluctuation in the District share likely reflects on the relative profitability of the traditional Corn Belt enterprises relative to the enterprises that are more dominant in other regions of the United States.

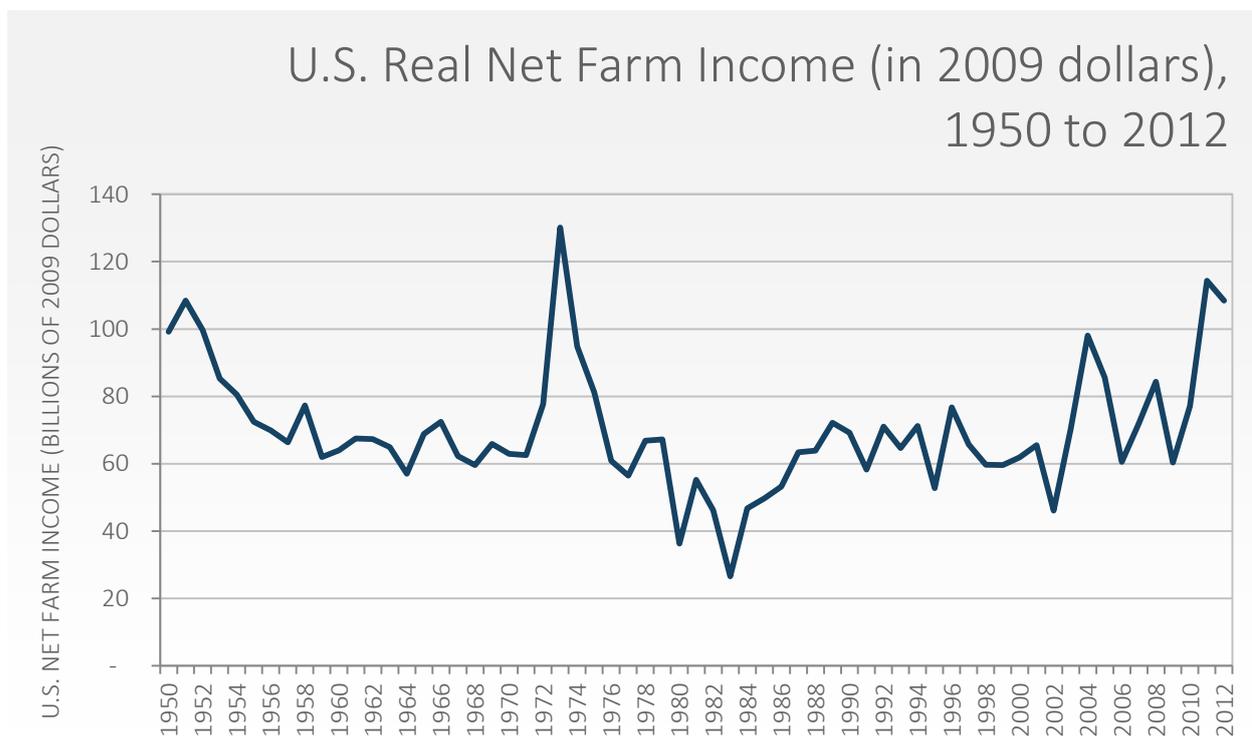
## Inflation-adjusted net farm income: volatility

### Farm Income Glossary

**NET FARM INCOME** - gross farm income less cash expenses and non-cash expenses, such as capital consumption and farm household expenses



When adjusted for inflation, the story of net farm income changes from one of exponential growth to volatility. The graph below shows the total U.S. net farm income in inflation-adjusted terms (2009 dollars) on an annual basis from 1950 through 2012. The highest observed value over this period was in 1973 at over \$130 billion. After the sharp decline through the height of the farm crisis in the early 1980s, real net farm income bottomed out at around \$26 billion in 1983. Through the 1990s, real net farm income was relatively flat around an average value of \$65 billion. Since 2004, real net farm income has been more volatile, with the second-highest value since 1950 recorded in 2011 at around \$114 billion. The USDA does not have a forecast for 2013 real net farm income; however, given that the nominal value is forecast at \$2.7 billion higher than 2011, it is a real possibility that we could see the 2013 real net farm income surpass the 2011 value.



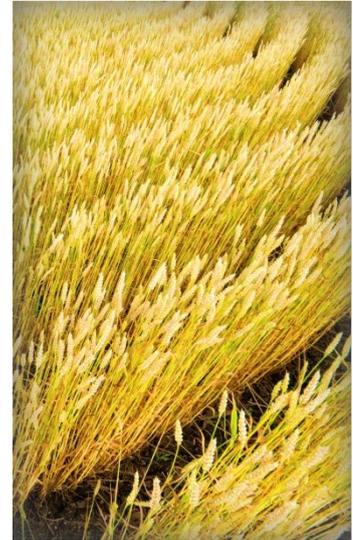
Source: USDA-ERS

# Challenges to District Land Values: Rising Interest Rates, Falling Crop Prices

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After years of rising land prices, what headwinds are on the horizon? The following indicators give clues to the direction of cropland values across the AgriBank District:

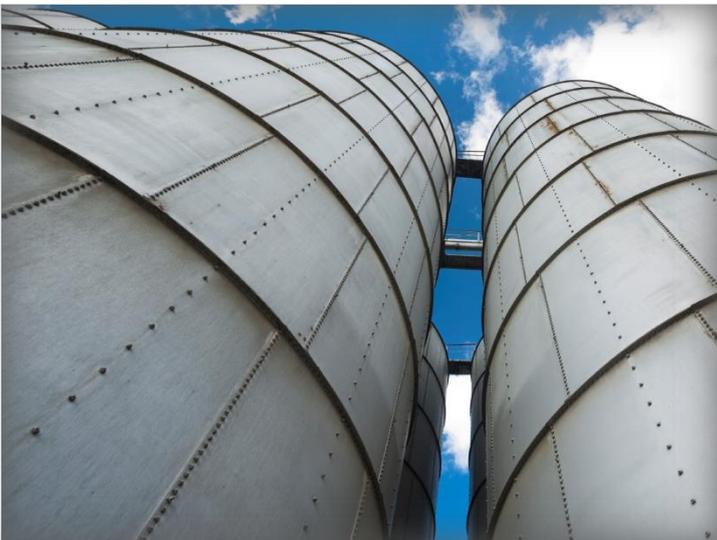
- Rising interest rates, as embodied in the 10-year U.S. Treasury rate
- Flattening implied cap rate, which appears hesitant to follow the Treasury rate lower
- Falling crop prices, particularly for corn, which is a key barometer for the District



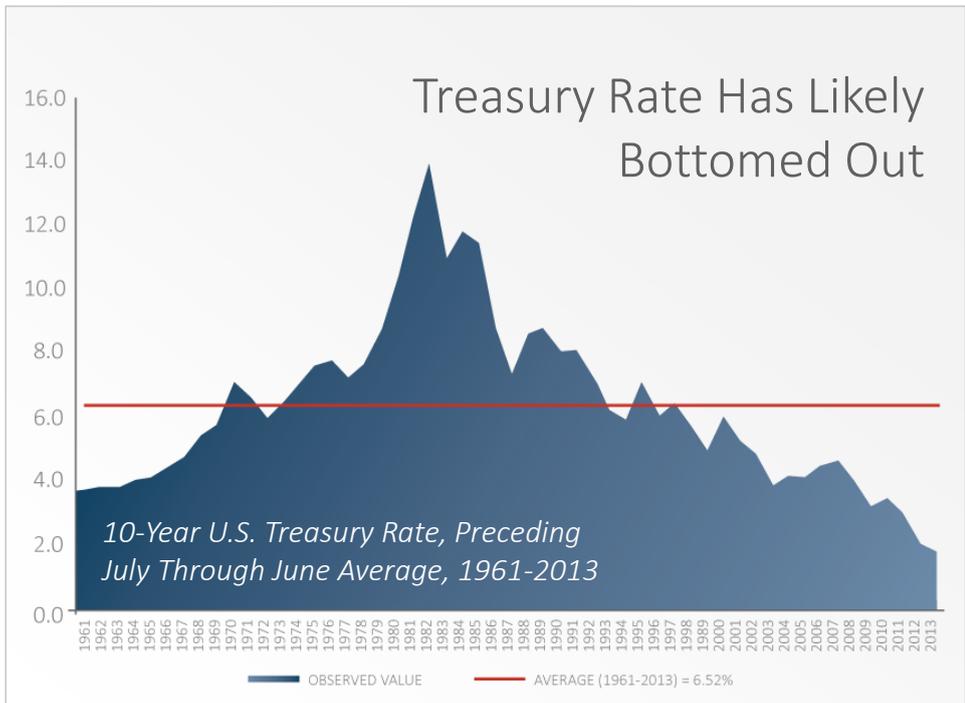
## *Interest rates – nowhere to go but up*

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From 1961 to 2012, the average 10-year Treasury rate (July through June average) peaked in the early 1980s at a little over 14 percent before beginning an almost 30-year declining trend. That trend, as shown in the graph on page 7, was sharply down from 1982 through 1987 and then began a more gradual decline from 1987 to 2012. If this rate of decline were to continue, the 10-year Treasury rate would reach close to 0 percent in about seven to 10 years—highly unlikely. The 10-year Treasury rate bottomed out at 1.8 percent for all of 2012 and is likely to move higher at a gradual pace. A forecasting service projects an average of 2.33 percent for 2013.



The red horizontal line in the Treasury rate graph on page 7 shows the long-term average rate from 1961 to 2013, which is equal to 6.52 percent. **The difficult question to answer here is whether the true mean rate has shifted over this time period.** In the short to intermediate term, we need to be concerned about the possibility of sharp increases in the 10-year Treasury rate. Based on historical patterns, there is only a small chance the annual average 10-year Treasury rate will increase by more than approximately 150 basis points from year to year. The chances of having two consecutive years of 150-basis-point increases or more is less than 1 percent.



Unfortunately, there is no good way to forecast what the future long-term average rate will be. We do know that a return to long-run rates in the 6 to 7 percent range is not entirely out of the question given the historical Treasury rate information. However, the chance of a 400-basis-point move over the next three to five years (from 2 to 6 percent) is relatively small based upon historical changes in the 10-year Treasury rate. A forecasting service projects the 10-year Treasury rate to reach 4.5 percent by 2017.

Source: USDA-ERS

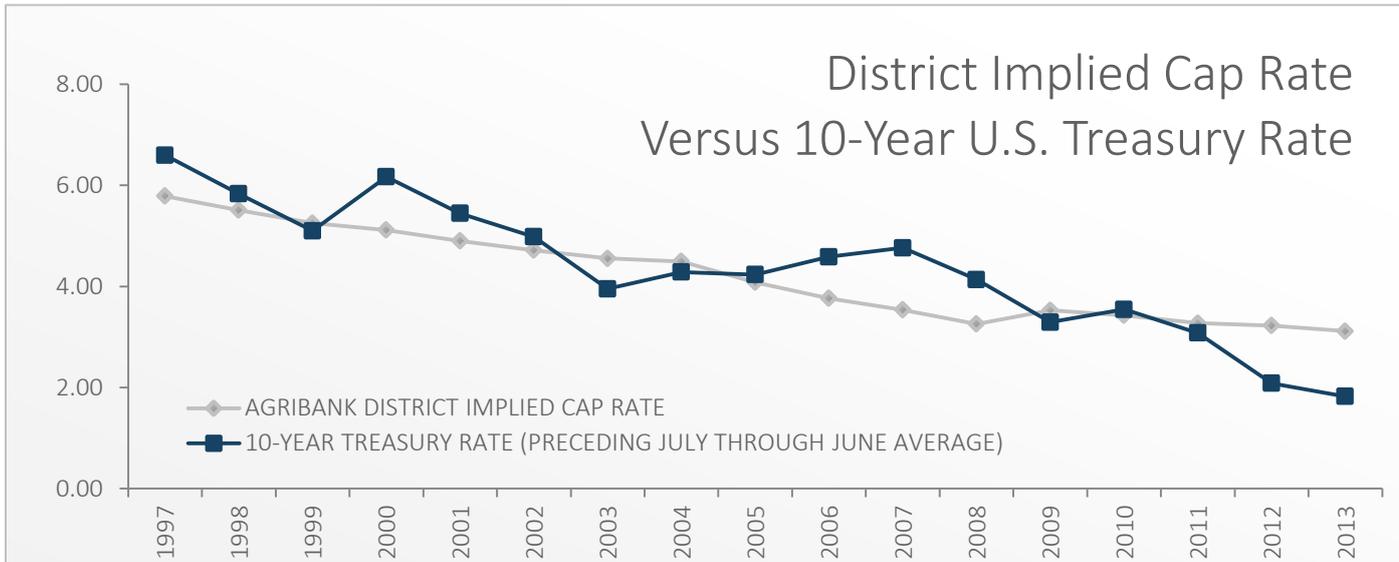
### *Implied cap rate – another barometer of farmland values*

An income capitalization (“cap”) model using District cash rents provides a theoretical estimation of the productive value of farmland. The “market implied cap rate” can be used to determine cropland values in the aggregate; in our analysis, the market implied cap rate is the District average crop cash rental rate divided by the average cropland value from the USDA survey.



The graph on page 8 shows the market implied cap rate for the AgriBank District using the USDA cash rental and cropland value data. Also included is the average interest rate on 10-year U.S. Treasury bonds for the 12 months prior (July through June) to the annual USDA survey. From 1997 through 2008, the District implied cap rate appears to fall mostly below the Treasury rate, with the exception of three years. On average, the implied cap rate was 0.42 percent below the Treasury rate over that period. However, it appears that the District cap rate has flattened out since 2008 and has not followed the Treasury rate lower. From 2009 to 2013, the implied cap rate averaged a premium of 0.55 percent over the Treasury rate. The cap rate appears to have reached a floor value near 3 percent, and participants in the cropland market appear to be very hesitant to follow the Treasury rate lower.

Keep in mind that the implied cap rate represents the market's collective expectations of future long-term values for the risk-free interest rate, risk premium, and growth rate for cash rentals. Essentially (and rightfully so), market participants are not buying the presumption that the current 10-year Treasury rate represents the true average future value of the market risk-free rate.



Source: USDA-ERS

The recent increase in the implied cap rate spread relative to the 10-year Treasury rate represents:

- the expectation that the long-run 10-year Treasury rate is higher than the current prevailing rate, and/or
- the market estimate of the long-run risk premium for owning District cropland is increasing relative to the long-run expected growth rate in cash rental rates

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**...the marketplace is taking a more prudent approach in determining the implied cap rate relative to the 10-year Treasury rate.**

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It is almost a given that the current historically low 10-year Treasury bill rates are not sustainable in the long run due to eventual inflation pressures.

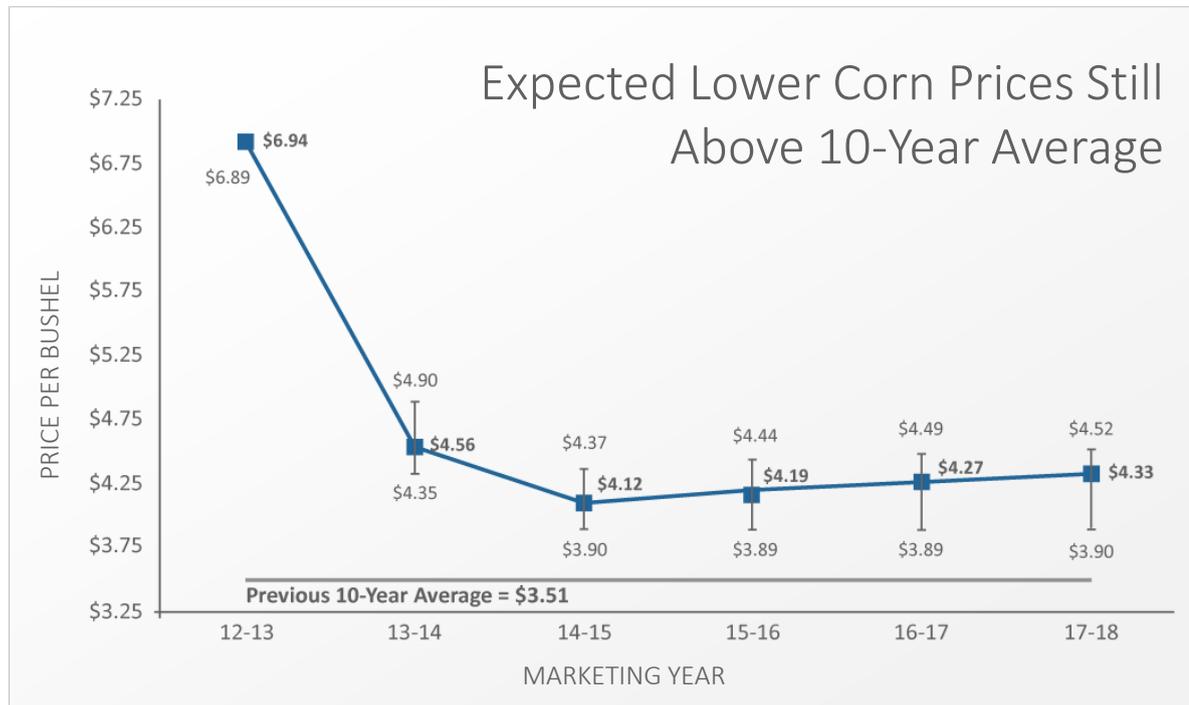
Given the substantial change in the spread from 2007 to 2013, there is a good possibility that the market does not expect interest rates to stay as low as has occurred in 2013, is building a risk premium into the cap rate and/or reducing the forecasted growth rate for cash rents. This is potentially good news for market participants, because it provides a strong indication that more realistic expectations are settling into the current valuations for AgriBank District cropland. This would provide more support to the notion of a “soft landing” as opposed to a “hard crash” for farmland valuations.

## Crop prices – the trend is down

...for corn, the return to trend yields in 2013 and beyond likely results in season-average prices falling from the high \$6.50 to \$7 levels in early 2013 to the current levels near **\$4.50 per bushel**.

Compared to rising interest rates, perhaps the more immediate challenge to District cropland values relates to crop prices. For crop marketing years 2011-12 and 2012-13, this is particularly true when considering the tight supply-demand situation for both corn and soybeans, which translates into potential price volatility.

Many forecasters have shown that, for corn, the return to trend yields in 2013 and beyond likely results in season-average prices falling from the high \$6.50 to \$7 levels in early 2013 to the current levels near \$4.50 per bushel. The graph below shows the composite high-low-average projections for U.S. average corn prices received by farmers based on the public and private forecasts we track. It shows a U.S. average corn price of \$4.56 per bushel for the 2013-2014 marketing year, dropping to \$4.12 the following year and then gradually increasing to \$4.33 by 2017. While lower than the recent \$6.50 to \$7 levels, these U.S. average corn prices would still be well above the previous 10-year average of \$3.51 per bushel.



*U.S. average corn price received by farmers  
Long-run forecasts, high-low-average of forecasts by the public and private forecasts that AgriBank tracks*

## *Rising interest rates and falling crop prices – their impact on cropland values*

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AgriBank examined several approaches to help shed light on the sensitivity of cropland values across the District to changes in crop prices and interest rates. Following is a summary of this analysis.

First, we looked at the sensitivity of cropland value changes to changes in District average net cash income and net farm income as reported on an annual basis by the USDA.

Regression models were fit for both measures and sensitivity tables derived. Both models indicated that a 50 percent decline in either net cash income or net farm income would result in approximately a 33 percent decline in cropland values.

Second, we examined a direct regression approach using cropland values as the dependent variable, with crop prices and the 10-year Treasury rate as the independent variables. Regressions were estimated for each state (using best-fitting crop price between corn, soybeans and wheat) to compare geographically. The results indicated that for every \$1 decline in corn prices (best crop price fit at the District level), average District cropland values would decline by an average of \$298 per acre, and for every 1 percent increase in the 10-year Treasury rate, average District cropland values would decline by an average of \$357 per acre.

Third, we looked at the sensitivity of cash rent capitalization to crop prices and interest rates. More specifically, we examined the sensitivity of an income capitalization equation to changes in crop prices and interest rates at the District level, with District average cash rents as the dependent variable and crop prices as the independent variable. We found that District cash rent values are highly sensitive to changes in corn prices, and the results are fairly consistent with the previously discussed approaches to determining the sensitivity of cropland values to changes in crop prices and interest rates. A scenario of a long-run average price level of \$4.50 per bushel for corn combined with a long-run average capitalization rate of 4 percent (assuming equal to the 10-year Treasury rate with risk premium equal to the long-run growth rate in cash rents) results in a 34 percent decline in the cropland values.



## Putting it all together

Lower crop prices are likely to impact cropland values sooner than rising interest rates. The decline in season-average corn prices to the near \$4.50 per bushel level (with interest rates staying the same) implies a 10 to 12 percent decline in District average cropland values if the models are correct.

The convergence of a drop in corn prices to the near \$4.50 per bushel level combined with a 2 percent increase in interest rates would result in cropland values dropping by approximately 30 to 34 percent, as implied by AgriBank's internal modeling efforts. This would be similar to the implications of a 50 percent decline in net cash or net farm income in terms of impact on cropland values.

While the return to trend crop yields is dropping season-average corn prices to near \$4.50 per bushel and soybean prices to the \$9 to \$11 per bushel range, prices could gradually start increasing by 2017. For interest rates, a long-run historical analysis of the 10-year Treasury rate indicates that year-to-year increases of 150 basis points or more are relatively infrequent (less than 5 percent of the time). A 200-basis point increase in one year would be at the extreme end of the range and highly unlikely. Therefore, the scenario of the 10-year Treasury rate increasing to 4 percent in the near term is extremely unlikely. It will likely take at least two to three years or more before the 10-year Treasury rate gets to the 4 percent level.



Falling crop prices and rising interest rates could take years to fully affect cropland values. However, their impact already appears to be evident in the slowdown or reversal of rising cropland prices. Average cropland prices declined in parts of the Farm Belt in the third quarter of 2013 from the previous quarter while rising at a low rate in other areas, according to separate reports released in November by the Federal Reserve banks in Chicago, St. Louis and Kansas City. Farmland values fell 6 percent in the third quarter in the St. Louis Fed district, which includes parts of the Midwest and Southeast. That was greater than an earlier drop of 2.3 percent in that region in the first quarter. In states surveyed by Federal Reserve Banks in Chicago and Kansas City, average cropland prices grew at an approximate rate of 1 percent in the third quarter.

# Borrowers, Lenders Prepared for Land Value Correction

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What if land values decline 30 percent or more — would we see a crisis that brings financial hardships to farmers and ranchers? Borrowers and lenders certainly need to be on alert. However, they have learned from experience and prepared for the next downturn. For a number of reasons, today's high cropland values are very different from the farm crisis of the 1980s or even the housing bubble of a few years ago.



Here are key reasons to be optimistic that borrowers and lenders alike are in for a soft landing, not a bursting bubble, if the upward trend in cropland values reverses course:

- **LACK OF SPECULATORS.** Farmers are still the predominant purchasers of farmland, not investors or speculators. An annual land survey by Iowa State University found that farmers made 78 percent of farm purchases in 2012. With a lack of alternative investments, producers are investing in more land. In most cases, there is a direct economic tie between the value of agricultural land and the net income derived

from the value of the crops produced on it. In some cases, farmers are taking advantage of opportunities to buy land in proximity to their existing operations — sometimes paying a premium to gain control of the land as the opportunity to purchase likely will occur only once in their lifetime. Conversely, previous price bubbles in other asset classes were based on the imagined future value of a technology company or a residential property.

- **STRONG DEMAND.** Demand for grain commodities from a growing global population remains strong and ultimately will support strong commodity price levels over the long term. In addition, net income for crop producers has increased due to improved farming practices and improved seed genetics.

- **CONTINUED LOW INTEREST RATES.** Many farmers have locked in low interest rates with fixed rate products that will help them through a land value downturn. In addition, historically low interest rates, which have played a part in land value increases, would remain historically low even if they increase modestly.



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So while commodity prices have fallen, interest rates are likely to rise, and land values seem headed for a correction, it's ***not all dark clouds*** on the horizon.

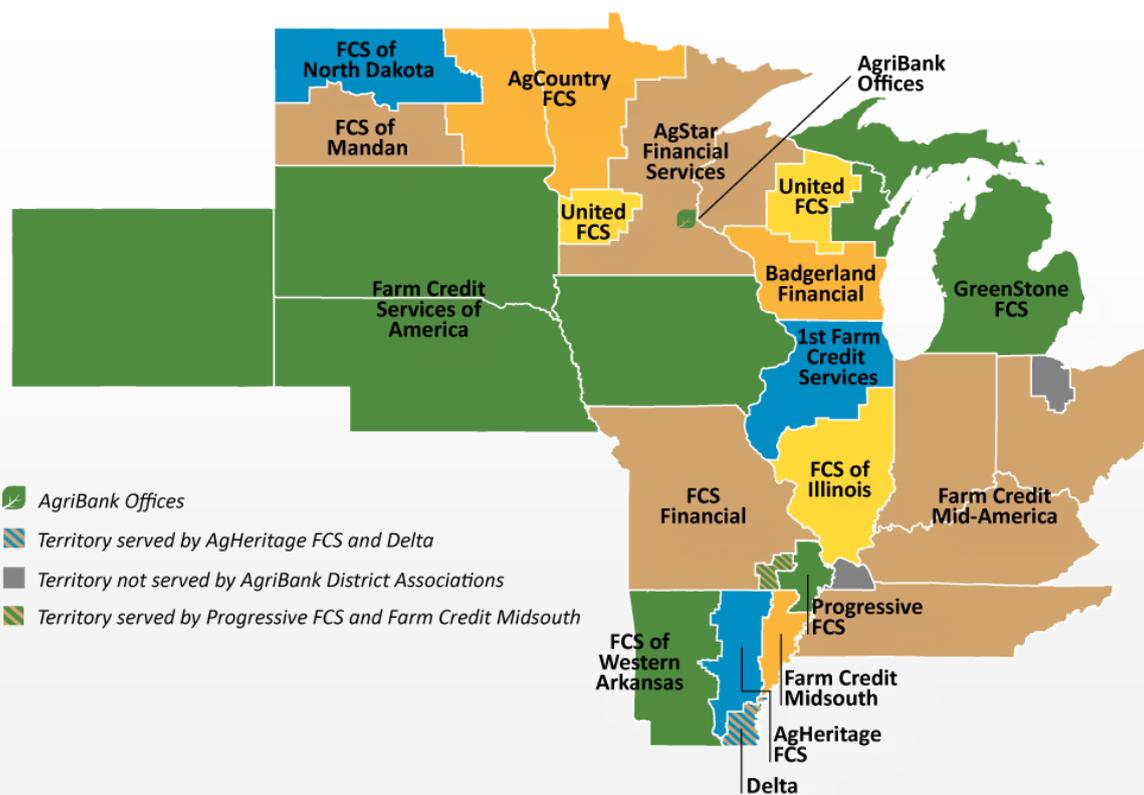
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- **PRODUCER FINANCIAL STRENGTH.** While falling commodity prices will have a negative impact on crop producers, a large majority of crop producers have built strong financial and liquidity positions from recent profitable years. Lower commodity prices generally will be positive for producers and processors who purchase these commodities as inputs in the production of beef cattle, dairy products, pork, poultry and ethanol. Furthermore, many producers have invested in equipment that improves efficiency, which further contributes to their profitability and ability to ride out a downturn.
- **CONSERVATIVE LENDING PRACTICES.** Associations in the AgriBank District — with improved capital positions and conservative lending practices over the past five years — are well-positioned for a potential drop in land values. Associations generally limit lending to 65 percent of the appraised value of farmland. Additionally, in some of the highest value areas of the District, some Associations are setting fixed dollar amount per acre limits on what they will lend — for example, lending only \$6,000 per acre even if land is selling for more than twice that. The result is that the farmers who are purchasing land at higher values are making higher down payments.

So while commodity prices have fallen, interest rates are likely to rise, and land values seem headed for a correction, it's not all dark clouds on the horizon. Across the AgriBank District, producers and lenders are generally well-positioned to weather a storm.



## Associations in the AgriBank District



## About AgriBank

### AgriBank

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AgriBank is one of the largest banks within the national Farm Credit System, with more than \$80 billion in total assets. Under the Farm Credit System's cooperative structure, AgriBank is owned by 17 affiliated Farm Credit Associations. The AgriBank District covers America's Midwest, a 15-state area from Wyoming to Ohio and Minnesota to Arkansas. More than half of the nation's cropland is located within the AgriBank District, providing the Bank and its Association owners with exceptional expertise in production agriculture. For more information, visit [www.AgriBank.com](http://www.AgriBank.com).

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