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## Projected Margins and Breakeven Prices for Corn

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A recent *farmdoc daily* article ([April 29, 2016](#)) examines the relationship between farm corn price and the stocks-to-use ratio. Using the authors' reciprocal model, the forecast of 2016-17 U.S. average farm corn price was \$3.70 per bushel. How does this price forecast relate to corn breakeven prices? The answer depends on a farm's cost structure, which is related to land productivity and farm efficiency. Both of these factors can vary substantially among farms. The impact of land productivity on breakeven prices is well known. However, the impact of cost structure on breakeven prices, though of obvious importance, is less well known. Cost structure and differences in per unit production costs among farms, can have a large impact on farm efficiency and breakeven prices. For example, a study by Yeager and Langemeier (2009) that examined the sustained competitive advantage of a sample of farms found overall or cost efficiency, which varies from 0 to 1 with 1 being the most efficient farm, to be 11% higher for the above average performance group and 14% lower for the below average performance group than it was for the average performance group. This article uses an enterprise budget and different cost structure assumptions to examine earnings per acre and breakeven prices for corn in Indiana.

The format of the enterprise budget used in this paper closely follows that of the Purdue Crop Cost and Return Guide ([here](#)). The Illinois crop budgets ([here](#)) use similar cost items, but are laid out differently. Both budgets incorporate cash costs and depreciation as well as opportunity costs. An opportunity cost represents the income that could have been earned if an input was sold or rented to someone else. Opportunity costs for unpaid family and operator labor, owned machinery, and owned land need to be included in an enterprise budget. Because opportunity costs are included in an enterprise budget, the bottom line figure (i.e., earnings or losses) represents an economic profit or loss. Over a long period of time, due to the fact that all inputs (cash items, depreciation, and opportunity costs) are being paid the market rate, economic or pure profit is zero. If economic profit is positive, input prices will be bid up, similar to what happened to cash rents during the last decade, and economic profit will migrate towards zero. Conversely, if economic profit is negative, input prices will decline, and economic profit will head towards zero or breakeven where all resources are paid their cash or opportunity costs.

Table 1 presents enterprise budgets for rotation corn on average productivity soil in Indiana for 2016. Trend yield and a price of \$3.70 per bushel were used in the budget. Government payments were assumed to be \$25 per acre. Differences between the columns depend on cost assumptions. The middle column, base cost, represents cost information presented in the Purdue Crop Cost and Return Guide. The first column assumes that costs are 10% lower than that for the base case, while the last column assumes that costs are

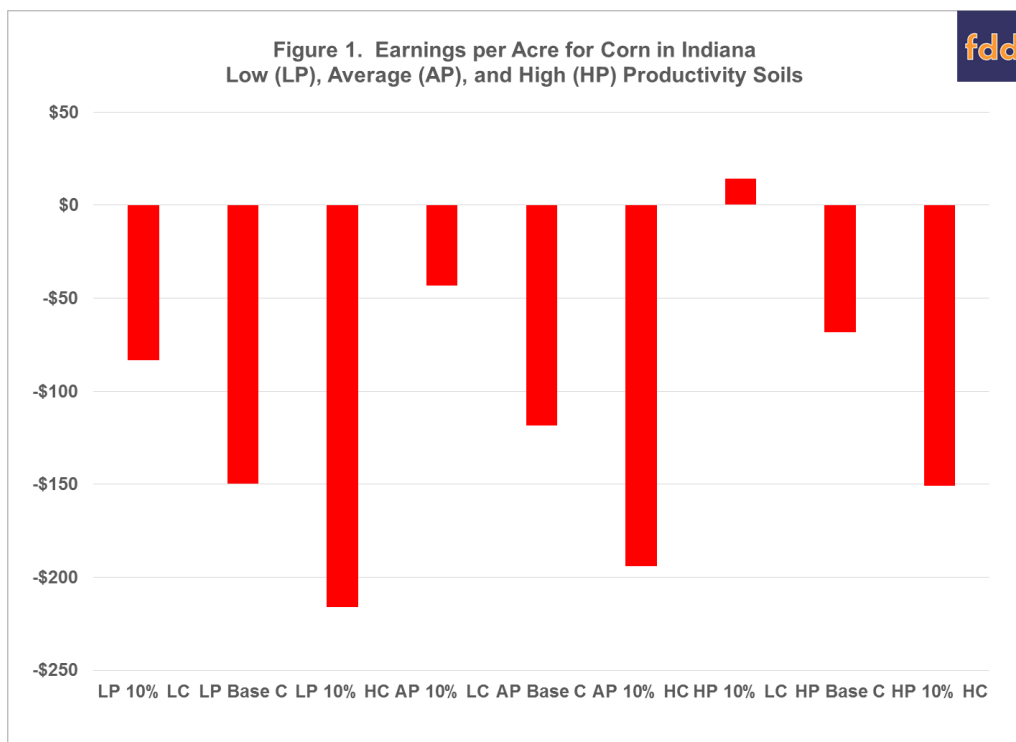
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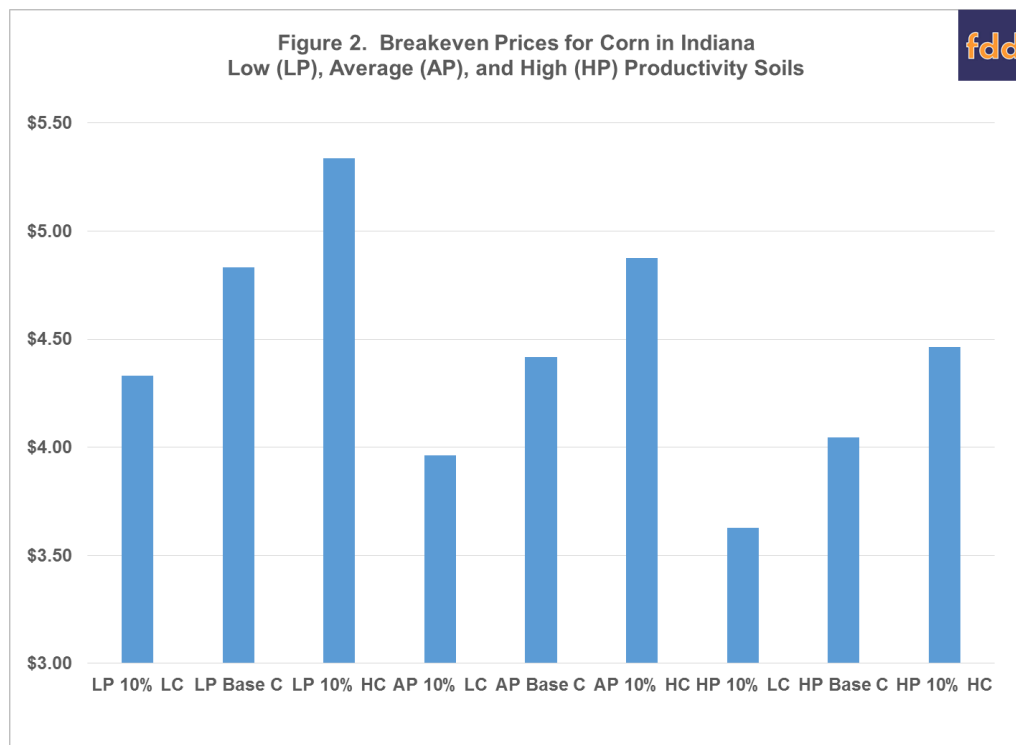
10% higher than that for the base case. A 10% lower or higher cost is very consistent with the differences in cost efficiency of individual farms based on farm record data, as noted earlier. For average productivity soil, earnings per acre range from -\$43 per acre for the lowest cost structure to -\$194 per acre for the highest cost structure. The breakeven corn price ranges from \$3.96 to \$4.88, or \$0.92 per bushel. Even if prices increase substantially, farms with the higher cost structure are going to find it difficult to breakeven. Also, these farms will face a larger deterioration in working capital, and may have more difficulty obtaining an operating loan next year.

Item	10% Lower Cost	Base Cost	10% Higher Cost
Yield	165	165	165
Price	\$3.70	\$3.70	\$3.70
Crop Revenue	\$610.50	\$610.50	\$610.50
Government Payment	\$25.00	\$25.00	\$25.00
Market Revenue	\$635.50	\$635.50	\$635.50
Variable Cost	\$359.10	\$399.00	\$438.90
Overhead Cost	\$319.50	\$355.00	\$390.50
Earnings	-\$43.10	-\$118.50	-\$193.90
Breakeven Price	\$3.96	\$4.42	\$4.88

Figure 1 illustrates the impact of cost structure on earnings per acre for low, average, and high productivity soils. The base cost structures (LP Base C, AP Base C, and HP Base C) use information from the Purdue Crop Cost and Return Guide. Earnings per acre in figure 1 range from a negative \$216 per acre for the high cost structure on low productivity soil to positive \$14 per acre for the low cost structure on high productivity soil.



The impact of differences in cost structure on breakeven prices for low, average, and high productivity soils is illustrated in figure 2. Breakeven prices for the base cost structure are \$4.83 on low productivity soil, \$4.42 on average productivity soil, and \$4.05 on high productivity soil. Even with a low cost structure, the breakeven price on low productivity soil is still \$4.33 or considerably above expected price. In contrast, the breakeven price on high productivity soil drops below \$3.70 under the low cost structure assumption.



The results above demonstrate the importance of long-term cost control. It is difficult to change a farm’s cost structure overnight. However, farm management research does illustrate that there are some farms that are substantially more efficient than their peers. Focusing on ways to reduce the five largest costs (cash rent or land ownership, seed, fertilizer, machinery ownership, and labor), without reducing yield, is a good place to start. The results above also indicate how crucial it is to reduce costs on low productivity soil.

This article used an enterprise budget and different cost structure assumptions to examine earnings per acre and breakeven prices for corn in Indiana. In general, projected earnings per acre in 2016 are negative, and breakeven prices are above projected prices. However, farms with a lower cost structure are much closer to breaking even than those with even an average cost structure. Reducing per unit costs ranks as one of the most important challenges facing crop producers.

## References

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