So How Do I Make Corn and Soybean Pricing Decisions?

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Introduction

Corn and soybean producers have long identified price risk as one of the highest risk management priorities of the farm business. One of the major challenges, as well as sources of frustration, of corn and soybean pricing is the extreme variability in prices, not only across years, but within years. For example, during the 25 years from 1982-83 through 2006-07, the average marketing year price of corn received by Illinois producers ranged from $1.54 (1986-87) to $3.30 (1995-96). The daily spot cash price of corn in central Illinois during that period ranged from $1.22 (October 16, 1986) to $5.25 (July 11, 1996). The range of spot cash prices during the 12-month marketing year was not less than $.45 (1990-91) and was as large as $2.52 (1995-96).

For soybeans, the 12-month marketing year average farm price ranged from $4.50 (2001-02) to $7.94 (1983-84). The daily spot cash price of soybeans in central Illinois ranged from $3.87 (July 8, 1999) to $10.40 (March 22, 2004). The range of spot cash prices during the marketing year was not less than $.61 (1985-86) and was as large as $4.63 (2003-04).

A second source of challenge and frustration in making corn and soybean pricing decisions is that future prices cannot be anticipated with a high degree of accuracy. Producers have a long time period in which to price the harvest of a particular year. Futures contracts, and therefore forward pricing opportunities, currently are available four years into the future. The factors that determine prices cannot be accurately forecast that far into the future. Even limiting the pricing window to a few months before harvest through the summer after harvest, price-determining factors can and often do change dramatically, making the decision about when and how much of the crop to price extremely difficult. In the current environment of much higher prices and more diverse price-determining factors (e.g., biofuels mandates) the challenge and frustration of pricing corn and soybeans are likely to increase. In the first four months of the 2007-08 marketing year for example, the daily spot cash price of corn and soybeans in central Illinois varied by $1.30 and $3.70, respectively.

The traditional approach to making corn and soybean pricing decisions has been to use a combination of analytical techniques (generally characterized as fundamental and technical analysis) to forecast future price behavior and then time pricing decisions based on those forecasts. That approach has essentially been one of attempting to "beat the market". While considerable resources, both public and private, have been devoted to improving pricing decisions based on this approach, producers remain very frustrated by the decision-making process. In addition,

farmers generally believe that they do a poor job of pricing their crops. As an illustration, 80% of the 200 producers attending two University of Illinois seminars in December 2000 agreed with the statement that "Producers sell two-thirds of their crop in the bottom one-third of the annual price range." The limited research available on producer pricing performance (Anderson and Brorsen, 2005; Hagedorn, et al., 2005) suggests that this statement is not necessarily accurate, but it is widely-quoted and apparently widely-believed.

The failure of the traditional approach to pricing can be traced to two factors. The first is a narrow focus on market timing (attempting to beat the market) that ignores the potential implications of market efficiency concepts (Brorsen and Anderson, 1994; Zulauf and Irwin, 1998). In basic terms, market efficiency implies that the current price structure reflects all known information, and therefore, the only way to beat the market is to possess information not available to the market or to have superior analytical skills. The second is a lack of differentiation of pricing strategies based on the skills, characteristics, and beliefs of individual producers.

The development of new decision-rule grain pricing contracts adds another dimension to price risk management (Hagedorn, et al., 2003). In general, these contracts price a fixed number of bushels according to pre-determined rules. To date, efforts have not been conducted to take full advantage of these new innovations in developing appropriate portfolios of pricing strategies. A portfolio approach to making pricing decisions has the potential to make a very significant, positive impact on the marketing performance of producers. Not only is there significant potential to improve pricing performance, particularly for the chronic poor performers, but there is opportunity to reduce price risk for individual producers and to reduce the level of frustration associated with crop pricing.

The purpose of this brief is to introduce a new approach to making corn and soybean pricing decisions. This new "pricing matrix" approach is an integrated model of pricing that considers a broader range of strategies than the traditional approach.

The New Approach

The first step in this new approach is to select the appropriate time window for pricing corn and soybean crops. One method of defining the pricing window for a crop farmer is the period extending from the initial production planning time until the end of the storage season. First production decisions in Illinois normally occur in October through November of the year preceding planting (e.g., fall tillage and application of fertilizer), while the storage season typically extends through July or August of the year following harvest. This results in a pricing window about 20 to 24 months in length. The same window lengths are used in AgMAS performance evaluations of market advisory services. Window length can also be influenced by expectations about seasonal price patterns. Seasonal patterns since 1973 suggest the optimal pricing window for corn and soybeans in Illinois may run from April before harvest to May after harvest (Irwin et al., 2006). On average, there have been large price penalties for holding crops into the summer after harvest.

The second step in the new approach is to determine the relevant set of crop pricing strategies. The traditional approach is to develop a plan for the timing of pricing decisions and pair this with the selection of a pricing tool (spot cash sales, cash forward contract, futures, options, or hybrid cash contract). A sounder approach is to define a pricing philosophy, or approach to pricing, that includes a portfolio of self-directed and externally-managed pricing strategies. Self-directed strategies ("do-it-yourself") may include: i) mechanical strategies that routinely price bushels at

2

predetermined intervals and increments; and ii) active strategies that time sales based on a producer's own price analysis and evaluation (this is the traditional approach to crop pricing). Externally-managed strategies are those where someone else makes pricing decisions and may include: i) mechanical strategies with pricing pre-determined by decision-rule contracts; and ii) active strategies where timing decisions are based on the price analysis of professional market advisors and pricing decisions are implemented by the advisor or a grain firm.

The portfolio approach to developing corn and soybean marketing strategies is a general approach to making pricing decisions and is similar to the oft recommended strategy of diversifying an investment portfolio. It is generally recommended that investment portfolios be diversified across types of investment products (stocks, bonds, real estate, retirement accounts, etc.). In addition, it is generally recommended that investments within a particular product be further diversified. Stock investments, for example, can be in individual stocks either selected by the investor or by an advisor, and those stocks can be further diversified as "high risk" or "low risk." An investor can also diversify across investment approaches by devoting some funds to buy-and-hold strategies and other funds to strategies that actively time purchases and sales to take advantage of price movements.

The third step in the new approach is to decide on the proportions of the crop to be marketed via each of the pricing strategies. This is the heart of the new approach to pricing corn and soybean crops:

	Mechanical	Active
Self-Directed	% ?	% ?
Externally-Managed	% ?	% ?

The percentages distributed among the cells in the pricing matrix (marketing approaches) will be primarily influenced by five factors that may be unique to each producer; i) view on market efficiency; ii) risk preference, iii) financial position; iv) pricing skill, and v) decision-making discipline. An expanded version of the pricing matrix is shown at the top of the next page. It matches different skills and beliefs with the rows and columns of the pricing matrix

The rows in the expanded matrix are divided based on marketing discipline, with disciplined marketers preferring self-directed approaches and undisciplined marketers preferring externally managed approaches. Discipline in this context is characterized by the ability to stay with a pricing plan once it is formulated and "pulling-the-trigger" when pricing decisions should be made. The columns are divided based on the other four factors. If a producer believes that cash, futures, and options markets are efficient in the sense of fully reflecting available information, then that producer generally should follow mechanical pricing strategies that assume it is impossible to beat the market. Producers who believe markets are efficient should follow active pricing strategies only if they possess information not available to the market or have superior analytical skills. If a producer believes that cash, futures, and options markets are inefficient, then active strategies that attempt to beat the market will be preferred. Risk-averse producers with high debt will prefer mechanical strategies that are likely less risky than active strategies, and vice versa. Finally, producers with poor pricing skills will prefer mechanical strategies and producers with good pricing skills will prefer active strategies. Pricing skills refers here to the ability to successfully time market price movements. Note that if a producer believes he/she has poor pricing skills, regardless of his/her view on market efficiency, the producer should only consider mechanical pricing strategies.

	Mechanical	Active
Self-Directed	Disciplined Marketer Markets are Efficient Risk Averse High Debt Poor Pricing Skills	Disciplined Marketer Markets are Inefficient Risk Seeking Low Debt Good Pricing Skills
Externally-Managed	Undisciplined Marketer Markets are Efficient Risk Averse High Debt Poor Pricing Skills	Undisciplined Marketer Markets are Inefficient Risk Seeking Low Debt Good Pricing Skills

There are obviously a number of combinations of the five factors that could be considered. The combinations shown above are not meant to be definitive or exhaustive. The following examples help further demonstrate how the pricing matrix approach could be applied by individual producers.

Example #1. A producer who has a preference for risk, possesses good pricing skills, has a strong financial position, believes markets are inefficient, but is an undisciplined marketer, might use the following proportions:

	Mechanical	Active
Self-Directed	0%	25%
Externally-Managed	25%	50%

Consistent with the producer's beliefs about market efficiency and his/her own pricing skills, the proportions are heavily weighted towards active strategies (75%). At the same time, recognizing that marketing discipline is a problem, the proportions are also weighted heavily towards externally-managed strategies (75%).

Example #2: A producer who does not have a preference for risk, possesses poor pricing skills, has a weak financial position, believes markets are usually efficient and is a disciplined marketer, might use the following proportions:

	Mechanical	Active
Self-Directed	60%	10%
Externally-Managed	20%	10%

In this example, the proportions are heavily weighted towards mechanical strategies (80%) due to the producer's beliefs about market efficiency, risk preferences, and financial position. However, since the producer is a disciplined marketer, the proportions are tilted toward self-directed strategies (70%).

The fourth step in the new approach is to evaluate performance after the marketing window is completed. This step is crucial for determining the success of the selected pricing allocations. Memory and impressions regarding pricing performance are prone to hindsight bias (tendency to remember only the good or bad decisions depending on one's personality). Evaluation must be based on facts not impressions.

The starting point is to compute a net price received for each pricing allocation that is comparable across allocations and crop years. Net price received should be a weighted-average across bushels priced and adjusted for storage costs and government program benefits. Net price received can then be compared across allocations and to different benchmarks. Benchmarks compare performance to an objective standard or "yardstick."

Market benchmarks measure the price offered by the market. Peer benchmarks measure the price received by other farmers. Professional benchmarks measure the price received by professional market advisory services. All benchmarks should be computed using the same basic assumptions applied to the pricing track record for each allocation. Comparison of net prices received across allocations and to external benchmarks will provide an objective evaluation of performance and suggest adjustments to portfolio allocations. An extensive discussion of benchmark concepts and construction can be found in AgMAS evaluations of market advisory service performance (e.g., Irwin et al., 2006).

Summary

The pricing matrix approach to developing corn and soybean marketing strategies is a general approach to making pricing decisions. It is similar to the oft recommended strategy of diversifying one's investments across different types of investment products. The emphasis here is on strategy and not on the implementation of specific pricing decisions (pricing tool, timing, etc.). Implementation of pricing decisions within a cell of the pricing matrix will be impacted by a variety of factors, including crop insurance selections and government program payments.

As a final point, we want to emphasize our belief that many producers are substantially under-diversified in terms of pricing approaches, with an over-reliance on self-directed active strategies (upper-right cell of the pricing matrix). Diversification across the four cells of the pricing matrix would likely improve marketing performance for these producers. In addition, diversification would more than likely reduce the risk and frustration of making corn and soybean pricing decisions for most producers.

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