



## Price Risk Management: What to Expect

# Mechanical Marketing Strategies

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This is the fourth of a five-part series on managing price (marketing) risk. The first fact sheet (AGEC-589) presented the fact that few people and possibly no producers can predict prices. Prices cannot be predicted because the market uses all available information to determine price. What makes today's price different from yesterday's price is "new information." If this "Efficient Market" hypothesis is correct, then one marketing strategy is nearly as good as any other marketing strategy. What is important is that producers develop "rules" for marketing.

Fact Sheet AGEC-590 reported on research conducted at Kansas State University by Drs. Terry Kastens and Kevin Dhuyvetter. They used records from more than 800 Kansas farms during a 10-year period to evaluate management practices explaining the difference between the top one-third and the bottom one-third of the farms. Their conclusion was that price (marketing strategy) made little or no difference in the profitability of the farms. Important management factors were costs, yields and use of technology.

Fact Sheet AGEC-591 reports on the AgMAS project conducted at the University of Illinois by Irwin, Good and Martines-Filho (<http://www.farmdoc.uiuc.edu/agmas/reports/index.html>). This report addressed two basic performance questions for market advisory services in wheat:

1. Do market advisory services, on average, outperform an appropriate market benchmark, and
2. Do market advisory services exhibit persistence in their performance from year-to-year?

Data on wheat net price received for advisory services, as reported by the AgMAS Project, are available for the 1995 through 2004 crop years. Not only do market advisory programs in wheat consistently fail to "beat the market," their performance may not be as good as a simple mechanical marketing strategy.

### Mechanical marketing strategies

Producers have little chance of predicting prices, which are among the least important management practice in increasing the profitability of a farm. The use of mechanical marketing strategies not depending on price outlook, market information or any analysis may be the most efficient way to sell cash commodities.

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A producer using a mechanical marketing strategy sells the commodity the same way every year. An example is to sell the commodity at harvest every year. Price level or outlook does not change the marketing strategy. No price outlook is needed or used. Market information may be ignored. Mechanical marketing strategies require actions be taken irrespective of the market.

### Marketing Plans or Strategies

By using forward contracts, futures contracts, put option contracts and/or call option contracts; producers may sell wheat before it is harvested. After harvest, the wheat may be sold, stored, stored and hedged, stored and protected with a put option or sold and protected with a call option.

The following sections show the net price if different plans had been used during the 29-year period 1986 through 2014. Marketing strategies are divided into two groups: pre-harvest and post-harvest. Selling wheat at harvest (June 20) each year is included in both the pre- and post-harvest strategies.

Prices for strategies using futures and option contracts were adjusted for brokerage and interest costs. Post-harvest prices were adjusted for interest costs and storage. Interest costs were the prime interest rate plus 2 percent and storage costs were per bushel costs charged by central Oklahoma elevators (about 2.6 to four cents per bushel per month).

Producers with on-farm storage and/or lower interest rates (self-financed) would receive higher net prices for storing wheat than shown here. Thus, on-farm storage and lower interest makes storing wheat into the fall more attractive.

Averages were calculated for the 5-, 10- and 29-year periods using price, storage costs and interest rates for the June 1986 through May 2015 time period. The 5- and 10-year averages emphasize how the results may change by dropping or adding marketing years. The ranking of the alternatives may be changed by selecting different marketing years to average. For comparing the average net prices between strategies, the 29-year averages are the most reliable.

### Pre-Harvest Results

For pre-harvest strategies, only one-half of expected production is forward contracted, hedged or covered with option contracts (Table 1). Pre-harvest strategies consist of:

1. Selling wheat on June 20.
2. Forward contracting one-half of expected production on April 1 and selling remaining production on June 20.

**Table 1. Pre-harvest Marketing Strategies: Net Price for All Wheat Sold Using Listed Strategy.**

Crop Year <sup>a</sup>	Sell June 20 <sup>b</sup>	4/1FC + Sell 6/20 <sup>c</sup>	4/1Hedge 6/2Sell <sup>d</sup>	FC & Buy @ \$ Call <sup>e</sup>	Buy @ \$ Put Sell 6/20 <sup>f</sup>
1986	\$ 2.20	\$ 2.17	\$ 2.24	\$ 2.05	\$ 2.18
1987	\$ 2.33	\$ 2.31	\$ 2.30	\$ 2.20	\$ 2.23
1988	\$ 3.58	\$ 3.11	\$ 2.72	\$ 3.29	\$ 3.29
1989	\$ 3.84	\$ 3.75	\$ 3.81	\$ 3.51	\$ 3.64
1990	\$ 2.91	\$ 2.99	\$ 3.08	\$ 2.98	\$ 3.01
1991	\$ 2.52	\$ 2.58	\$ 2.68	\$ 2.52	\$ 2.56
1992	\$ 3.26	\$ 3.27	\$ 3.28	\$ 3.12	\$ 3.12
1993	\$ 2.47	\$ 2.60	\$ 2.64	\$ 2.64	\$ 2.59
1994	\$ 2.98	\$ 2.95	\$ 2.90	\$ 2.98	\$ 2.95
1995	\$ 3.74	\$ 3.42	\$ 3.05	\$ 3.64	\$ 3.59
1996	\$ 5.47	\$ 5.18	\$ 4.77	\$ 5.31	\$ 5.19
1997	\$ 3.09	\$ 3.38	\$ 3.58	\$ 3.44	\$ 3.36
1998	\$ 2.61	\$ 2.79	\$ 2.87	\$ 2.87	\$ 2.73
1999	\$ 2.28	\$ 2.42	\$ 2.57	\$ 2.39	\$ 2.43
2000	\$ 2.53	\$ 2.57	\$ 2.42	\$ 2.53	\$ 2.38
2001	\$ 2.79	\$ 2.88	\$ 2.84	\$ 2.85	\$ 2.74
2002	\$ 3.00	\$ 2.87	\$ 2.98	\$ 2.80	\$ 2.93
2003	\$ 2.72	\$ 2.70	\$ 2.71	\$ 2.66	\$ 2.67
2004	\$ 3.40	\$ 3.59	\$ 3.60	\$ 3.47	\$ 3.49
2005	\$ 3.17	\$ 3.05	\$ 3.09	\$ 3.03	\$ 3.07
2006	\$ 4.45	\$ 4.01	\$ 4.08	\$ 4.23	\$ 4.29
2007	\$ 5.41	\$ 4.44	\$ 4.45	\$ 5.24	\$ 5.24
2008	\$ 8.20	\$ 8.46	\$ 8.34	\$ 8.13	\$ 8.03
2009	\$ 5.64	\$ 5.10	\$ 5.34	\$ 5.02	\$ 5.26
2010	\$ 3.74	\$ 3.86	\$ 3.65	\$ 3.80	\$ 3.58
2011	\$ 7.85	\$ 8.13	\$ 8.75	\$ 7.63	\$ 8.25
2012	\$ 6.53	\$ 6.49	\$ 6.58	\$ 6.35	\$ 6.44
2013	\$ 7.38	\$ 7.14	\$ 7.33	\$ 7.01	\$ 7.22
2014	\$ 7.03	\$ 7.10	\$ 7.33	\$ 6.76	\$ 6.95
1986-14	\$ 4.04	\$ 3.98	\$ 4.00	\$ 3.95	\$ 3.98
2005-14	\$ 5.94	\$ 5.77	\$ 5.77	\$ 5.82	\$ 5.83
2010-14	\$ 6.51	\$ 6.53	\$ 6.49	\$ 6.51	\$ 6.47

a Jun 1 through May 31.

b Price received if all wheat had been sold on June 2 each year.

c One half of expected production was sold on April 1 and the remainder sold on June 20.

d One half of expected production was hedged on April 1 and the remainder sold on June 20.

e KC July "at the money" put option contracts were purchased to cover expected production.

f Expected production was forward contracted and KC July "at the money" call option contracts were purchased to cover the forward contracts.

- Hedging one-half of expected production on April 1 and offsetting the hedge and selling the wheat on June 20.
- Buying "at the money" July put option contracts for one-half of expected production on April 1 and offsetting the put(s) and selling the wheat on June 20.
- Forward contracting wheat and buying "at the money" July call option contracts for one-half of expected production on April 1 and delivering the wheat, offsetting the call option(s) and selling the remainder of the wheat on June 20.

The difference between the best pre-harvest strategy and the worst pre-harvest strategy is 17 cents and six cents for the 5- and 10-year averages, respectively, and nine cents for the 29-year average (Table 1).

Selling at harvest produced the highest 29-year (1986 – 2014) average price and the highest 10-year (2005 – 2014) average price. A combination of forward contracting and selling at harvest provided the highest 5-year (2010 – 2014) average price. Selling all wheat at harvest produced the highest average price in 13 years of the 29 years. Because of greater costs, the pre-harvest strategies were expected to yield a price a few pennies less than the harvest price.

Forward contracting one-half of the expected production and selling the remaining at harvest (FC + June 20) produced the highest average price four times (2000, 2001, 2008 and 2010).

Forward contracting and buying call option contracts tied for the highest price three times (1993, 1994 and 1998) and produced the highest 10-year average price. During the 29-year period, forward contracting and buying a call option was three cents better than just buying put option contracts.

Hedging produced the highest price in 12 of the 29 years and produced the highest average price for the 5-year period 2010 through 2014. Hedging produced the lowest (tied with forward contract) average price for the 10-year period 2005 through 2014.

While there is a nine-cent spread in the 29-year, a 17-cent spread in the 10-year, and a six-cent spread in the five-year averages, the differences may be insignificant (differences would change with a different selection of years or dates). One strategy may be as good as another, but the results may favor selling at harvest.

## Post-Harvest Strategies

Post-harvest strategies are:

- Sell wheat on June 20.
- Sell wheat on October 15.
- Sell wheat on December 15.
- Sell wheat in lots of one-third on June 20, October 15, and December 15.
- Sell wheat on June 20 and buy "at the money" December call option contracts.
- Store wheat and buy "at the money" December put option contracts.
- Store wheat and sell December wheat futures contracts.

## Post-Harvest Results

The average prices from strategies 6 (store wheat and buy "at-the-money December put option contracts) and 7 (store wheat and sell December wheat futures contracts) are sufficiently lower than the other strategies, they warrant

**Table 2. Post-harvest Marketing Strategies: Net Price for All Wheat Sold Using Listed Strategy.**

<i>Crop Year<sup>a</sup></i>	<i>Sell 6/20<sup>b</sup></i>	<i>Net 10/15<sup>c</sup></i>	<i>Net 11/15<sup>d</sup></i>	<i>Net 12/15<sup>e</sup></i>	<i>Sell Jun, Oct &amp; Dec<sup>f</sup></i>	<i>Sell 6/20 Buy Call<sup>g</sup></i>
1986	\$ 2.20	\$ 2.09	\$ 2.12	\$ 2.09	\$ 2.13	\$ 2.11
1987	\$ 2.33	\$ 2.40	\$ 2.33	\$ 2.58	\$ 2.44	\$ 2.31
1988	\$ 3.58	\$ 3.52	\$ 3.50	\$ 3.46	\$ 3.52	\$ 3.11
1989	\$ 3.84	\$ 3.52	\$ 3.46	\$ 3.48	\$ 3.61	\$ 3.64
1990	\$ 2.91	\$ 2.19	\$ 2.17	\$ 2.01	\$ 2.37	\$ 2.77
1991	\$ 2.52	\$ 3.06	\$ 3.22	\$ 3.37	\$ 2.98	\$ 3.00
1992	\$ 3.26	\$ 3.01	\$ 3.04	\$ 3.08	\$ 3.12	\$ 3.04
1993	\$ 2.47	\$ 2.80	\$ 2.83	\$ 3.34	\$ 2.87	\$ 3.00
1994	\$ 2.98	\$ 3.64	\$ 3.52	\$ 3.37	\$ 3.33	\$ 3.22
1995	\$ 3.74	\$ 4.59	\$ 4.61	\$ 4.58	\$ 4.30	\$ 4.41
1996	\$ 5.47	\$ 3.98	\$ 3.53	\$ 3.62	\$ 4.35	\$ 5.12
1997	\$ 3.09	\$ 3.23	\$ 3.19	\$ 2.81	\$ 3.04	\$ 2.87
1998	\$ 2.61	\$ 2.47	\$ 2.54	\$ 2.34	\$ 2.47	\$ 2.43
1999	\$ 2.28	\$ 1.97	\$ 1.96	\$ 1.74	\$ 2.00	\$ 2.05
2000	\$ 2.53	\$ 2.60	\$ 2.46	\$ 2.42	\$ 2.51	\$ 2.32
2001	\$ 2.79	\$ 2.42	\$ 2.55	\$ 2.39	\$ 2.53	\$ 2.61
2002	\$ 3.00	\$ 4.35	\$ 3.99	\$ 3.59	\$ 3.65	\$ 3.80
2003	\$ 2.72	\$ 2.99	\$ 3.54	\$ 3.45	\$ 3.05	\$ 3.18
2004	\$ 3.40	\$ 3.13	\$ 3.21	\$ 3.05	\$ 3.19	\$ 3.12
2005	\$ 3.17	\$ 3.38	\$ 3.15	\$ 3.24	\$ 3.27	\$ 2.93
2006	\$ 4.45	\$ 5.06	\$ 4.72	\$ 4.49	\$ 4.67	\$ 4.43
2007	\$ 5.41	\$ 7.65	\$ 7.11	\$ 9.14	\$ 7.40	\$ 6.69
2008	\$ 8.20	\$ 4.77	\$ 4.82	\$ 4.45	\$ 5.81	\$ 7.63
2009	\$ 5.64	\$ 4.22	\$ 4.54	\$ 4.44	\$ 4.77	\$ 5.03
2010	\$ 3.74	\$ 6.23	\$ 6.21	\$ 6.95	\$ 5.64	\$ 5.36
2011	\$ 7.85	\$ 6.75	\$ 6.83	\$ 6.07	\$ 6.89	\$ 7.17
2012	\$ 6.53	\$ 8.01	\$ 8.14	\$ 7.95	\$ 7.50	\$ 7.62
2013	\$ 7.38	\$ 7.22	\$ 6.56	\$ 6.20	\$ 6.93	\$ 6.88
2014	\$ 7.03	\$ 5.45	\$ 5.46	\$ 6.02	\$ 6.17	\$ 6.58
1986-14	\$ 4.04	\$ 4.02	\$ 3.98	\$ 3.99	\$ 4.02	\$ 4.08
2005-14	\$ 5.94	\$ 5.88	\$ 5.75	\$ 5.90	\$ 5.90	\$ 6.03
2010-14	\$ 6.51	\$ 6.73	\$ 6.64	\$ 6.64	\$ 6.63	\$ 6.72

a June 1 through May 31.

b Price received if all wheat had been sold on June 20 each year.

c Price received if all wheat had been sold on October 15.

d Price received if all wheat had been sold on November 15.

e Price received if all wheat had been sold on December 15.

f Average price received if wheat was sold 1/3 at a time on June 20, October 15, and December 15.

g Net price received if wheat was sold on June 20, "at the money" December call option contracts were purchased on June 20 and sold on November 15.

removal from consideration. Another strategy analyzed but not shown is "selling wheat in one-third lots on June 20, October 15 and November 15. The results were essentially the same as strategy 4 (selling wheat in lots of one-third on June 20, October 15 and December 15).

Without tax considerations, selling 6/20 and buying a call is the single best strategy. Never, in the 29-year period was selling cash at harvest and buying at-the-money KC December call options to cover the cash sales the best strategy in any given year. For both the 29- and 10-year average prices, the call option strategy produced the highest average price and for the five-year average the option strategy is within one cent

of the highest average.

The problem is that selling wheat and buying a call option contracts might be considered a speculative position by IRS and taxed as such. The IRS limits the amount of speculative losses that can be deducted. A speculative futures gain or loss is treated as 40 percent short term and 60 percent long term.

*A net capital gain portion that is short term is taxed at the farmer's ordinary income tax rate and the long-term portion could be taxed at zero, 15 percent or 20 percent, depending upon the farmer's ordinary income*

*tax rate. A net capital loss is not so favorably treated. The deductibility of a capital loss is limited to \$3,000 annually with the unused portion carried forward to future tax years until it is used up. Since we are dealing with an option, the largest possible loss is the cost of purchasing the option, so a producer might want to limit such a strategy to a \$3,000 option premium.*

*Example: Joe Farmer sells his wheat and buys call options. Later in the year, Joe nets \$15,000 on the speculation. The breakdown of the profit is as follows: Short-term capital gain is \$6,000 (\$15,000 x 40 percent); Long-term capital gain is \$9,000 (\$15,000 x 60 percent). (Source: J.C. Hobbs)*

Price variability between 2007 and through 2014 tended to magnify the net price differences between strategies. In the 2007 marketing year, the net price increased from \$7.11 (Net 11/15) to \$9.14 (Net 12/15). In 2008, the June 20 price was \$8.20, and prices had fallen to \$4.77 on October 15. Similar price changes happened in 2011 and 2014. The best indication of the price differences is the 29-year (1986/87 through 2014/15) average prices. The average net price range was from \$3.98 (Net 11/15) to \$4.08 (Sell 6/20 Buy Call). If removing the last five years, selling at harvest would have had the second highest average price (\$3.52; 1986/87 through 2014/15) with the call option strategy the highest (\$3.53) by one cent.

Selling at harvest (Sell 6/20) had the highest net price in 14 years of the 29 years. Selling October 15 had the highest net price six years out of 29 years. Selling November 15 had the highest net price three years out of 29 years. Selling December 15 had the highest net price in five years of the 29 years. Staggering sells in thirds, nor selling all wheat and buying call options, had zero highest prices during the 29-year period. Note that the borrowing rate of interest is used. For a producer with no outstanding loans, the interest opportunity cost would be lower, and storage would be more profitable.

During the last five years (2010/11 through 2014/15), selling wheat in October never had the highest net price. Yet, the five-year average price was the highest, with 22 cents more than the average price from selling at harvest.

If the June 2010 to October 2010 \$2.49 price increase is removed, selling at harvest becomes the strategy that produces

the highest net price in both the 10- and 29 year averages. Since 2007/08, selling at harvest produced the highest net price in four years of the eight years.

The results shown in Table 2 may appear to favor selling all wheat at harvest and buying call option contracts to protect against higher prices. However, given the potential tax consequences and that none of the average 10- or 29-year average prices are statistically different from each other, one strategy may be as good as any other strategy.

The five-year averages favor selling wheat in the fall. The 24 years prior to 2010/11 favor selling at harvest. Just about any strategy, except storage hedges or storing and buying put option contracts, will work relatively well.

## Perfectly Predicting Prices

If each year the strategy producing the highest price were selected, the net price received would be higher than selling at harvest. Using the 29-year average, always selecting the right pre-harvest strategy would increase the net price from \$4.04 (harvest) to \$4.55.

Selecting the best post-harvest strategy would result in a net price of \$4.56. This is 52 cents more than selling at harvest (6/20).

## Conclusions

Few, if any, people can predict wheat prices. If producers can't predict prices, or know someone who can, and get the predictions to them in a timely manner, mechanical marketing strategies may be the best way to sell wheat.

Mechanical strategies will produce a relatively good net price with minimal effort. The differences between one marketing strategy and another are small. One interpretation of these results suggests, "It does not matter which marketing alternative is used, in the long term the average price received will be very close to any other choice."

The good news for producers that enjoy marketing and keeping up with price trends, cycles and patterns is that efforts to "beat the market" will, on average, only cost a few cents a bushel.

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