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Cornhusker Economics

Cooperative Extension

Institute of Agriculture & Natural Resources
Department of Agricultural Economics
University of Nebraska -- Lincoln

Multi-Year Hedging of Corn, 1973-1995

I've enjoyed being your editor the past six years. Please welcome Nancy Pritchett as your new editor.

--Pat Norris

Market Report	Yr Ago	4 Wks Ago	4/18/95
Livestock and Products,			
Average Prices for Week Ending			
Slaughter Steers, Ch. 204, 1100-1300 lb			
Omaha, cwt.	\$	\$ 67.63	\$ 67.88
Feeder Steers, Med. Frame, 600-650 lb	59.38		
Dodge City, KS, cwt.		75.37	80.00
Carcass Price, Ch. 1-3, 550-700 lb	50.13		
Cent. US, Equiv. Index Value, cwt.		98.30	100.33
Hogs, US 1-2, 220-230 lb	87.59		
Omaha, cwt.		48.15	55.60
Feeder Pigs, US 1-2, 40-45 lb	51.44		
Omaha, hd.		*	*
Fresh Pork Loins, Wholesale, 14-18 lb	*		
Cent. US, cwt.		102.00	120.10
Slaughter Lambs, Ch. & Pr., 115-125 lb	120.10		
Sioux Falls, SD, cwt.		97.63	95.00
Carcass Lambs, Ch. & Pr., 1-4, 55-65 lb	85.88		
FOB Midwest, cwt.		183.00	183.00
	170.00		
Crops,			
Cash Truck Prices for Date Shown			
Wheat, No. 1, H.W.			
Omaha, bu.	6.39	4.23	4.88
Corn, No. 2, Yellow			
Omaha, bu.	4.43	2.80	2.81
Soybeans, No. 1, Yellow			
Chicago, bu.	7.99	8.39	8.47
Grain Sorghum, No. 2, Yellow			
Kansas City, cwt.	7.87	4.84	4.86
Oats, No. 2, Heavy			
Omaha, bu.	*	*	*
Hay,			
First Day of Week Pile Prices			
Alfalfa, Sm. Square, RFV 150 or better			
Platte Valley, ton.	*	135.00	*
Alfalfa, Lg. Round, Good			
Northeast Nebraska, ton.	*	75.00	75.00
Prairie, Sm. Square, Good			
Northeast Nebraska, ton.	62.50	72.50	72.50
* No market.			

Multi-year hedging involves placing a hedge for more than one year and then unwinding it as physical product is sold. A recent study analyzed two-year hedges for corn in an attempt to capture the higher prices that occurred over the 23-year period of 1973-1995. Cash prices were for No. 2 yellow corn at Omaha on October 15, or the nearest business day. Futures prices were from the December contract month at the Chicago Board of Trade.

Over the 23 years, corn prices were at times very high caused by a number of unusual factors. The high prices generally returned to traditional levels under normal supply and demand conditions. Reflecting on the price patterns over an extended period of time suggests the possibility of trying to capture the benefits of higher prices for more than one year. The institutional mechanism for doing this is the futures market. Hedging for an annual period, or within a crop year, eliminates price risk but still involves basis risk. Hedging over multiple crop years involves additional uncertainties related to supply and demand conditions, and adds the risk associated with inter-year spreads.

A reasonable and pivotal assumption for the study was a decision maker's perception of historical price levels, and how the hedge decision was based on these historical prices. The analysis used a decision rule based on the prior four years of prices before a potential hedge. The trigger point for a hedge was when a price reached the upper 10 percent of the past prices.



With the benefit of hindsight, a corn producer or agribusiness handling grain would see basis and inter-year spread statistics as given in Table 1. Over the 23-year period, the average basis for No. 2 yellow corn at Omaha was 21.8¢ per bushel under the December futures price in mid-October. The standard deviation was 11.7¢ per bushel. The minimum value for the basis was 46.3¢ under the December futures, and the maximum was 2.3¢ under indicating a considerable range in values.

Table 1. Basis and Inter-Year Spread for Corn at Omaha, 1973-1995.

	Average	Standard Deviation	Minimum	Maximum
	----- cents/bushel -----			
Basis	-21.8	11.7	-46.3	-2.3
Inter-Year Spread	4.9	28.4	-57.5	47.5

The average inter-year spread was 4.9¢ per bushel and a statistical "t" test suggests that the average value was not significantly different than zero. However, one standard deviation of 28.4¢ per bushel along with the range from minus 57.5¢ to plus 47.5¢ shows the amount of variability that occurred from one mid-October date to the next.

The largest inter-year spread of minus 57.5¢ happened in 1983 which was an extremely unusual year for corn production. The Payment-In-Kind or PIK program along with drought raised mid-October cash prices in 1983 by 60 percent compared to 1982. The next largest inter-year spread of December futures prices in mid-October occurred in 1995 for a value of minus 48.8¢ per bushel (not shown).

Table 2. Price Statistics for Long-Term Marketing Strategies, 1973-1995.

	Average	Standard Deviation	Minimum	Maximum
	----- cents/bushel -----			
Cash	238.4	55.7	132.5	366.0
Annual Hedge	234.5	40.5	152.7	327.9
Two-Year Hedge	242.1	66.1	131.1	359.0

Price statistics for three marketing strategies are given in Table 2. The average cash price for corn at Omaha in mid-October was 238.4¢ and was nominally greater than the average price of 234.5¢ received by placing an annual hedge on the first of May each year. Statistically the two prices were not different. The annual hedge price included a transactions cost of 2.6¢.

The nominal variability of cash prices was greater than for annual hedge prices as shown by the standard deviation of 55.7¢ compared to 40.5¢, respectively. A statistical "F" test showed the variances were not significantly different.

The average price for a two-year hedge strategy was 242.1¢, and in nominal values looked greater than the average prices for cash sales and annual hedging. Statistically, the two-year hedge average price was no different than the other two price averages. Two-year hedge prices had greater nominal variability, as measured by the standard deviation of 66.1¢, when compared to the standard deviations for the other two price series. The difference in variability was statistically significant for two-year hedges versus annual hedges, but not when compared to cash sales.

The results showed that even using a high trigger price for a two-year hedge, when applicable, the average price over the 23 years was no better than cash sale prices at harvest, and no better than a simple annual hedge set in May. The variability or risk associated with the two-year hedge was higher than for annual hedging.

One conclusion is that attempts to capture multi-year benefits from a higher price, when it happens even at the upper 10 percent level of past prices, is very elusive. Another conclusion is that in the long-run the underlying conditions for supply, demand, and price determination appear to even out the pricing strategies. In a short-run period, a decision maker may achieve greater price benefits from a multi-year strategy versus a simple strategy, but in a subsequent period may experience losses, which argues for a convergence of pricing outcomes over an extended period. It appears the judicious use of the futures market can reduce the variability of prices, but not for multi-year hedging.

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