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How Farmers Use Futures to Reduce Risk

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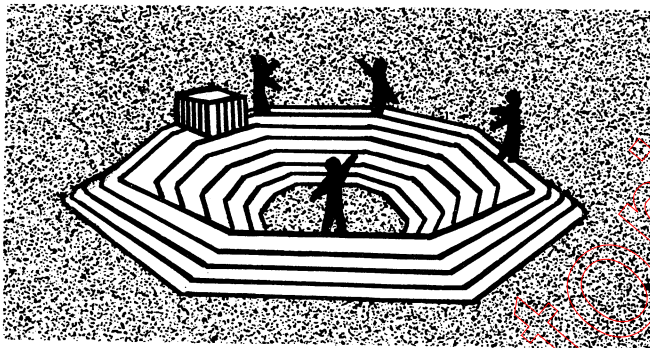
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HOW FARMERS USE FUTURES TO REDUCE RISK



PURDUE UNIVERSITY

Cooperative Extension Service • Lafayette, Indiana



Historic Document

HOW FARMERS USE FUTURES TO REDUCE RISK

R. E. Schneidau and W. S. Farris
Agricultural Economics

- What is futures trading? It is trading in contracts for future delivery of a specified commodity.
- Where is futures trading done? At commodity exchanges in major cities - usually through brokers.
- Who trades in futures? Farmers, dealers, processors, exporters, and speculators.
- Why do these businessmen trade in futures? 1) to hedge an inventory (either owned or anticipated) 2) to hedge forward sale positions 3) to speculate.



Indiana farmers are increasingly concerned with the use of the futures markets. This publication is designed to explain futures trading as well as to present methods of using the futures market in the farm operation.

Futures trading is carried on through commodity exchanges in major U.S. cities. Commodities traded range from corn, soybeans and live hogs to frozen orange juice.¹ This report deals primarily with trading in corn or soybeans, live cattle and hogs.

Farmers Use Futures Markets Indirectly

Many farmers are indirectly involved with the grain futures markets through their local dealers. Country grain elevators may deal in futures directly, or they may deal indirectly through their terminal elevators.

When grain elevators contract with farmers for a harvest price in advance of delivery, they in turn sell a similar amount of grain futures contracts to protect their price position.

Concepts Basic to Futures Trading

Several concepts basic to trading in futures are: 1) Trading is done in contracts for given quantities of specified commodities. 2) Trading is done on margins. 3) Trading is done for delivery in specific future months. 4) Prices of commodities traded on both cash and futures markets are influenced by many of the same forces and tend to fluctuate together.

Contracts, Not Commodities Traded

Only contracts, or promises to deliver or receive at a future date a given amount of a specified commodity at an agreed upon price are traded. Commodities are not traded on futures markets. This is analogous to buying or selling for future delivery.

¹ In the midwest the major exchanges for these commodities are the Chicago Board of Trade and the Chicago Mercantile Exchange.

Futures Contracts Traded On Margin. Commodity contracts are bought and sold on futures markets on a margin. The margin is the amount you deposit with your broker as a "guarantee" you will fulfill the contract. At the time the initial agreement to purchase and/or deliver at some future date is made, both parties are required to deposit a "margin." This margin remains a part of your account just as any other deposit.

Margin requirements vary, but are currently about \$.22/bu. for soybeans, \$.12/bu. for corn, \$.15/bu. for wheat and \$.07/bu. for oats. Most futures contracts for grains are traded in 5,000 bushel lots. The margin required for a live choice cattle contract (25,000 lbs.) is currently \$300. This means you can negotiate a futures contract consisting of 25,000 pounds of live beef cattle (of certain specifications) valuing about \$6,000 for only about \$300. A futures contract for 20,000 pounds of a specified weight and grade live hogs also requires a \$300 margin.

Futures Trading Takes Place Only For Specified Future Time Periods. Contracts traded for each commodity are traded only for specified future months. These are called delivery months. For example, in December, futures contracts for corn may be traded for the delivery months of March, May, July, September and December. Usually about the time one contract "matures" (comes due), a new forward trading month is opened.

Most futures contracts "mature" or become due 7 business days prior to the end of the contracted or delivery month. This means that if a March futures contract had been sold in December, the delivery and acceptance of delivery must be made near the end of March, i.e; the commodity must be delivered per the contract terms.

In most cases, however, those who purchase and sell futures contracts have little intention of accepting delivery or delivering the contracted commodity. This may be because the grade specified in the contract is not the commodity desired or delivery terms or place may not be satisfactory. On the other hand, the seller usually finds it to his advantage to simply buy back an equivalent contract prior to maturity and sell his product locally. This feature of futures trading needs to be understood: The number of sales always equals the number of purchases. If one contract of March corn is sold, one is purchased. Therefore, if the person who had previously sold a March corn contract desires to clear himself of his commitment to deliver corn in March, he simply buys back an equivalent March contract, offsetting his sale. If the price had dropped between the time of his sale and purchase, the dollar amount of the per bushel decline is his gain (less commission charges and interest on margin capital). On the other hand if March futures has risen, he would have to buy back his futures contract at the higher price experiencing a loss in the transaction.²

Trading can be done by telephone. From the farmers standpoint, the physical process of trading in futures markets is relatively simple. After establishing financial responsibility with a broker, trading in futures can be done by phone. The deposit or "margin" is made at the time trading takes place. The trader tells his broker the terms under which he desires to trade and the broker handles the actual

² There are minimum margin requirements that must be maintained. If prices had risen as in this example, the loss experienced by the trader would be taken from his margin deposit. When the amount on deposit becomes insufficient to cover losses and still remain above the minimum requirement, the borker will ask the trader to deposit additional margin.

transaction. For this service the broker charges a commission.³ This commission covers what is termed a "round-turn," that is a futures purchase and its liquidating sale or a sale and its liquidating purchase.

Cash and Futures Markets Related. Some of the same supply and demand forces affecting cash prices also affect future prices. For example, if current stocks of corn are found to be smaller than expected, both current cash and futures prices for corn would be expected to rise. If stocks became larger for some reason, the opposite price movements would be expected to take place. Therefore, there is a tendency for both cash and futures prices to move in the same direction and by nearly the same magnitude. Obviously, they do not always rise and fall together perfectly, since not all forces affect both markets equally. It is this correlation between cash and futures price movements that permits hedging agricultural commodities.

In addition to the fact that cash and futures prices tend to rise and fall together, the difference between cash and futures prices tends to become smaller as contract maturity is approached. As an example, it would normally be expected that the difference between cash December corn prices and May futures prices would be greater than the difference between cash corn prices in March and May futures. This exists because the costs of carrying corn is higher for 5 months than it is for 2 months.

Hedging

Mechanics of Hedging. Hedging is used for the purpose of transferring risk of an adverse price movement to someone willing to assume that risk and is accomplished through the futures market mechanism. In its simplest form, it is the sale of futures contracts against the purchase of the cash commodity, or vice-versa.

Assume cash grain is being held in storage pending future sale, and the holder of the cash grain fears cash prices may decline before the sale is made. A hedge against this anticipated adverse price movement can be made by selling an equivalent amount of futures contracts. Successful hedging is based on the assumption that cash and futures prices generally move in the same direction and by nearly the same magnitude and means a loss in one market is offset by a gain in the other. Therefore, if the price of the commodity the hedger is holding for future sale declines, he would lose money on his cash sale. But if he had sold futures, he could now buy back his futures at the lower price, offsetting his loss in the cash market. (Since cash and futures do not necessarily move up and down by exactly the same magnitude, final results of the hedging transaction may show that the hedger more than offset his cash market losses in the futures market, equaled his cash losses, or did not quite recuperate his cash losses.)

It is important the hedger know the historical relationships between local market area cash prices and central market futures prices. For example, whether a given community would or would not become a deficit corn area in the summer would have considerable bearing on the relationship between cash and futures prices for that area.

In the examples that follow, if it becomes apparent that the trend in price is opposite that anticipated, then it may be desirable to take action by cancelling the hedge and continuing in an un-hedged position. This is because gains may be "hedged away" just as losses may be protected.

³ Though commission charges vary slightly from time to time, current changes amount to \$22 per contract for corn, \$24 for soybeans, \$22 for wheat and \$25 for a live hog or cattle contract.

Table 1. Hedging corn against a possible price decline

Cash Market			Futures Market	
Day Corn moved into storage (Nov.)	\$1.20/bu.	Sell	\$1.38/bu.	(May)
Day Corn in storage was sold	1.10/bu.	Buy	1.25/bu.	(May)
	\$-.10/bu.		\$+.13/bu.	
Net Gain = \$.03/bu.				

Hedging Corn Against A Possible Price Decline. In November, farmer Brown made his decision to store corn for future sale in order to postpone his income into the next tax year. If prices declined he would lose money in the cash market, but he also knew he could sell May futures for \$1.38/bu. Farmer Brown decided to hedge by selling May futures (Table 1). By April 15, the cash price of corn had declined to \$1.10/bu., but since Farmer Brown needed the money he decided to sell his stored corn for a loss of \$.10/bu. Since he had sold a futures contract (and since cash and futures prices tend to move up and down together) and futures prices had declined to \$1.25/bu., to complete his hedge, he bought back his futures commitment \$.13/bu., cheaper than he sold it offsetting his cash market loss and gaining \$.03/bu. for storage. Had he not hedged, his losses would have amounted to \$.10/bu.

Establishing Corn Price at Planting Time. To establish crop prices in advance of planting or harvest, the farmer sells, for future delivery, an amount of grain equivalent to expected production. Before harvest, these contracts can be bought back. Table 2 illustrates the transactions taking place when, in fact, cash prices do decline. The net loss illustrated amounts to \$.03/bu. instead of \$.15/bu., which would have been incurred without hedging. If cash prices had advanced in the meantime, those gains made by selling the cash crop would be cancelled by the necessity of buying the now higher priced futures contracts in order to cancel his commitment.

Table 2. Establishing corn price at planting time

Cash Market			Futures Market	
May (Plant)	\$1.15/bu. (est. for fall)	Sell	\$1.33/bu. (Dec.)	
November	Sell \$1.00/bu. (actual)	Buy	\$1.21/bu. (Dec.)	
	\$-.15/bu.	Net Loss	\$.03/bu.	\$+.12/bu.

Establish Prices for Feed in Advance. To establish the price of corn for anticipated feeding needs the feeder deals in the futures market by purchasing forward contracts.

Consider the case of Farmer Brown, a large hog feeder, who has feeding needs in excess of his corn production. In November he sees he can buy July corn futures for \$1.35/bu. compared to current cash prices of \$1.15/bu. (Table 3). By April, corn he will shortly need for feeding has advanced on the cash market to \$1.35/bu. Since the cash market advanced, it would be expected that futures also advanced, which July futures did, to \$1.45/bu. Farmer Brown can now sell his July futures contract for a \$.10/bu. gain which he applies towards the purchase of cash corn.

Table 3. Establish prices for feed in advance

Cash Market			Futures Market		
In November	Sells	\$1.15/bu.	Buy	\$1.35/bu.	(July)
In April	Buy	\$1.35/bu.	Sell	\$1.45/bu.	(July)
		\$-.20/bu.		\$+.10/bu.	
\$.10/bu. Applied to Cash Purchase					

Sell At Harvest, Buy Futures (not a hedge)

Successful trading here depends upon seasonally advancing prices. Farmer Brown has no storage facilities, but expects corn prices to advance. He sells all his cash corn and buys offsetting July futures contracts for \$1.35/bu.⁴, hoping futures prices will advance so that he can sell his July contracts for a profit (Table 4). As illustrated, prices do rise to \$1.45/bu. and Farmer Brown sells his futures contracts making a \$.10 profit (less commission fees and interest on margin capital). Had prices declined \$.10/bu., Farmer Brown would have lost \$.10/bu. or \$500/contract. If he had stored the grain and prices declined, he would have lost money anyway (had he not hedged the stored commodity), and furthermore he had the use of most of his money from the cash sale of his corn in November.

Table 4. Sell at harvest, buy futures

Cash Market			Futures Market		
In November	Sell	\$1.20/bu.	Buy	\$1.35/bu.	(July)
			Sell	\$1.45/bu.	(July)
				\$+.10/bu.	

Hedging Against A Price Decline--Cattle

Table 5 illustrates the following explanation of hedging live beef cattle. On January 1, livestock feeder Brown buys 25 600-pound feeder cattle. He plans to put 400 pounds of gain on these cattle, which he figures will be ready for Market June 1. He must get at least \$26.40/cwt. for these cattle at market time to break even (figured on the basis of \$28/cwt. cost of feeders and a total cost of feeding per cwt. of \$24). Farmer Brown fears prices may be lower than this by June. June futures are selling for \$28/cwt., so he hedges by selling futures contracts.

By June 1 the sale of the 25 1000-pound fat steers bring \$25/cwt., a loss of \$1.40/cwt. But futures have also fallen to \$25/cwt. and can be bought back for a \$3/cwt. profit.

⁴ It should be noted that quotations of futures for distant months usually reflect the storage cost of carrying the grain to the delivery month.

Table 5. Example of hedging against a possible price decline--cattle

	Price Per Cwt.	Return for Animal	
		Cash Market (at feedlot)	Futures Market (at Chicago)
<u>A Livestock Feeder:</u>			
1. On January 1, <u>Buys</u> 600# feeders @	\$28.00	\$168.00	
Puts on 400# of gain @ cost of	24.00	<u>96.00</u>	
Selling weight 1000# choice Total cost		<u>\$264.00</u>	
(Break even selling price 1000#)	<u>\$26.40</u>		
2. On January 1, he <u>Sells</u> June futures for 1000# choice steers @	28.00		\$280.00
3. On June 1, he <u>Sells</u> 1000# fat steers for cash @	25.00	250.00	
4. On June 1, he <u>Buys</u> back June futures for 1000# steers @	25.00		250.00
Loss or gain per head		-\$ 14.00	+\$ 30.00
Loss of gain per contract of 25,000# of live choice steers*		-\$350.00	+\$750.00

* Less cost of commission and interest on margin capital.

On one contract (25,000 pounds) the net gain (exclusive of commission costs and interest on margin capital) amounts to \$400. Had the cattle not been hedged, Farmer Brown would have experienced a \$350 loss. At the same time it must be remembered, had fed cattle prices increased, the hedge may have offset any gain that would have been made.

Note that to make the decision to hedge an accurate appraisal of production costs is necessary.

Hedging Against A Price Decline--Hogs

Table 6 illustrates a situation similar to that in the example cattle hedge above. On October 1 Farmer Brown buys 100 50-pound feeder pigs for \$40/cwt. or \$20 each. He plans to feed these pigs to 200 pounds and figures his total costs of production at \$16/cwt. or \$24 a hog. Therefore, Farmer Brown must get \$22/cwt. at market time or \$44 a hog to break even.

At the time of the feeder pig purchase (Oct. 1) Farmer Brown sells a February live hog futures contract for \$23.25/cwt. He is now hedged against a decline in cash prices.

Table 6. Example of hedging against a possible price decline--hogs

	Price Per Cwt.	Return and Cost per Animal	
		Cash Market	Futures Market
		(at feedlot)	(at Chicago)
1. On October 1, <u>Buys</u> 50# Feeder pigs	\$40.00	\$20.00	
Puts on 150# gain	16.00	<u>24.00</u>	
Selling weight 200# , U.S. 1 & 2 total cost		\$44.00	
(Breaking even selling price)	22.00		
2. On October 1, he <u>Sells</u> February futures for	23.25		\$46.50
3. On February 10th, he <u>Sells</u> 200# 1 & 2 hogs for cash	20.00	40.00	
4. On February 10th, he <u>Buys</u> back February futures	20.75		41.50
Loss or gain per head		-\$ 4.00	+\$ 5.00
Loss or gain per contract of 20,000# hogs*		-\$400.00	+\$500.00

* Less cost of commission and interest on margin capital.

On February 10, the 200-pound slaughter hogs are sold for \$20/cwt. which Farmer Brown figures as a \$2/cwt. loss. However, the futures contract may now be bought back at a new lower price of \$20.75/cwt. a gain of \$2.50/cwt. in the futures market.

The result of these transactions as shown in Table 6 are a \$4/head loss in the cash market and a \$5 a head gain in the futures market, for a net gain of \$1 a head or \$.50/cwt. Had Farmer Brown not hedged, his losses would have amounted to \$4/head or \$2/cwt. On the 100 hogs (20,000 pounds) the profit is \$100 vs. a possible loss of \$400 (exclusive of commission charges and interest).

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