

Grain Marketing: The Futures Market

Introduction

The futures markets offer grain producers the potential to expand the marketing year from a few weeks to over a year. A knowledgeable grain marketer can use the futures markets to increase profits and decrease risk at the same time. Opportunities are available which allow grain producers and buyers to price their grain well in advance of actual cash grain sales or purchases. In most marketing years, the highest prices do not occur at harvest. Hence, the futures markets often allow grain producers to receive a higher price.

An individual grain producer must understand the futures markets and the hedging process to use the futures markets effectively. This fact sheet presents a brief overview of hedging with the futures markets and the characteristics of futures trading. It then describes the mechanics of the short hedge, the long hedge, margin requirements for selling, and offers some hedging hints for the novice trader.

The Hedging Process

Hedging grain is a process of using the futures markets to lock in a price. The pricing risk (the ability to predict price) is exchanged for the basis risk (the ability to predict basis or the difference between local cash and futures prices). Since basis is more predictable than price, risk is reduced.

Two basic types of hedges are: the short hedge and the long hedge. The short hedge is designed to provide protection against falling prices, while the long hedge is designed to provide protection against increasing prices. Different types of short and long hedges exist. Each type is discussed later in this fact sheet.

Futures Trading

Characteristics

Some characteristics of using futures in marketing grain are sometimes misunderstood. Before a discussion of any specific strategies, it is necessary to explain a few of these characteristics.

- *The futures markets do not guarantee the highest price or even a high price.* They simply give marketers the opportunity to lock in a price—hopefully, an acceptable price—subject to basis risk.
- *Margin calls will only change the predicted effective selling or purchasing price of hedged grain by additional interest costs—* assuming the marketer either has sufficient cash or can obtain sufficient cash to meet the margin calls.

- *Paper losses are real losses.* Any losses accruing in a futures account will be realized when the futures position is liquidated if market conditions do not change.
- *All brokers are not the same.* Producers interested in using the futures market should carefully select their broker.
- *The maximum loss in a futures account is not limited to a limit move.* If market conditions change dramatically, the futures market may lock traders out by consecutive limit moves. A market which moves the limit up or down, does not imply that trades are occurring.
- *A preharvest grain hedge still has production risk.* However, because of the liquidity of the futures market, when a producer sees indications that production may not be as much as expected, he or she can reverse a position instead of being locked into a cash forward contract.

The Short Hedge

The short hedge is used to provide protection against falling prices. It is the type of hedge that most grain producers will use when they decide to use the futures markets to lock in a price. A short hedge begins at the time a marketer sells a futures contract, and then buys it back when the hedge is lifted and the cash grain is sold. Although it is possible to actually deliver grain to satisfy the contract, most grain producers will offset their initial short futures position by rebuying the contract.

If a grain farmer produces or has the physical grain, the following formula will allow him or her to predict the effective selling price:

Futures price (when initially sold)	
+ Ending basis	
- Commissions paid	
- Interest expense	
Effective selling price	

Since the hedge is placed before the ending basis is known, it is necessary to predict the ending basis. Many grain marketers will use the average basis of the last 5 years. If the actual ending basis is larger (more positive or less negative) than predicted, the effective selling price will be higher than the predicted price. Conversely, if the actual ending basis is less (less positive or more negative) than predicted, the effective selling price will be lower than expected. Since basis is much easier to predict than price, risk is lessened.

An example may make the formula easier to understand. The price of a Chicago Board of Trade (CBT) December corn futures is \$2.87 per bushel for a 5,000-bushel contract. The grain farmer expects to produce 20,000 bushels of corn and expects local cash prices to be 15 cents above the December futures in October (basis equals 15 cents when the corn is harvested). Assuming that commission costs are 2 cents per bushel per roundturn, and interest expense on margin money is 1 cent per bushel, the producer would sell four December futures contracts to be fully protected. For simplicity, everything will be computed on a per bushel basis. The producer's predicted effective selling price would be computed as follows:

Futures price	=	\$2.87
+ Ending basis	=	0.15
- Commissions	=	0.02
- Interest	=	0.01
Effective selling price	=	\$2.99

The price this producer will receive will be \$2.99, subject to his or her ability to predict basis accurately and produce 20,000 bushels of corn. If the basis in October actually ends up being 17 cents, the effective selling price will be \$3.01. If the basis actually ends up being 12 cents, the price will be \$2.96.

Suppose that in October, 20,000 bushels of corn are produced. The December futures price is \$2.50, and the local cash price is \$2.65. The effective selling price would be \$2.99. The producer would make \$0.34 in the futures market (\$2.87 futures price when sold, minus \$2.50 futures price when purchased, minus \$0.02 commission costs, minus \$0.01 interest costs). The \$0.34 profit from futures market transactions would then be added to the \$2.65 local cash price to arrive at the effective selling price of \$2.99.

If the December futures price is \$3.25, and the local cash price is \$3.40, the effective selling price would be \$2.99. The producer would lose \$0.41 in the futures market (\$2.87 futures price when sold, minus \$3.25 futures price when purchased, minus \$0.02 commission costs, minus \$0.01 interest costs). The \$0.41 loss from futures market transactions would then be subtracted from the \$3.40 local cash price to arrive at the effective selling price of \$2.99. In this second example, hedging the grain had the advantage of locking in a price, but the disadvantage of lowering the net price received.

Suppose the producer experiences a total crop failure. If October cash prices end up being \$3.40 with a basis of \$0.15, the producer will lose an additional \$0.41 per bushel because of his or her futures transactions. If October cash prices end up being \$2.65 with a basis of \$0.15, the producer will have an additional \$0.34 per bushel to offset the production losses. Normally, a producer will lift the hedge when production conditions indicate that yields will be below what is expected. Alternatively, many grain producers will only hedge a maximum of 50 percent of expected production, or even less, if historical yield records indicate, to protect against this possibility.

Types of Short Hedge

Harvest Hedge. This hedge is placed before the grain is harvested, and is removed when the grain is harvested and sold. It is designed to lock in a price, and hence provides protection against falling prices.

For a harvest hedge, the December contract should be used for corn, the November contract for soybeans, and the July contract for winter wheat. The general formula for computing the effective selling price previously presented, is appropriate to use as long as the grain hedged is produced. If the amount of grain hedged is not produced, then returns from futures transactions must be computed and added to the cash returns to determine the effective selling price. The formula for computing the returns per bushel from futures transactions is:

Futures Returns = futures price when
the contract is sold, minus futures price
when the contract is purchased, minus
commissions, minus interest expense.

Storage Hedge. This hedge is placed either at harvest or shortly after harvest to lock in a price, and to provide protection for stored grain. Any distant contract will work, but the appropriate contract would be the one which most closely aligns with the producer's intentions to sell the stored grain. Again, the general formula which was presented to compute the effective selling price would be appropriate. Since the grain is in storage (there is no production risk), the formula will always work.

In general, anytime the futures market presents an opportunity where the projected effective selling price is greater than the harvest price, plus the costs of storage, it is advantageous for the producer to store the grain and place a storage hedge. It is not unusual for the market to present such opportunities. A producer may essentially be guaranteed a profit for storing the grain.

Multiple Hedge. A number of multiple hedging strategies can be used with short hedging. A short hedger using multiple hedging places a short hedge when he or she believes prices will fall, and removes the hedge when prices are expected to increase. A multiple hedger may place his or her short hedge and then lift it, place it again, and then lift it again several times during the marketing year.

Research has shown that multiple hedging strategies have the potential to increase returns and reduce risk compared to cash marketing only, and hedge-and-hold techniques. Research also indicates that multiple hedging strategies which are technically based are more successful than strategies which are based on fundamental economic factors. However, multiple hedging places a premium on a marketing plan and a well researched strategy. It requires more skill than traditional hedging strategies. A novice at multiple hedging may find that he or she usually places and lifts hedges at the wrong times.

Short Hedge: Advantages and Disadvantages

Advantages:

- *Eliminates* price risk.
- *Extends* the marketing year.
- *Has high liquidity.* Because futures are publicly traded at a relatively high volume, farmers may reverse their positions quickly and easily.

Disadvantages:

- *Involves* basis risk.
- *Margin calls can increase* interest costs and *cause* cash flow problems.
- *Entails* selling in 1,000- or 5,000-bushel increments.
- *Requires marketing knowledge.* Hedging with the futures markets is generally less understood than some other forward pricing mechanisms, and demands greater marketing knowledge.
- *Reduces* profits with rising prices. Hedgers cannot take advantage of rising prices.
- *Carries production risk.* If a producer does not have the grain, there is still production risk. However, because of the high liquidity of futures markets, it is relatively easy for a producer to reverse his or her position when it is realized that production will not be as much as expected.

Short hedging with the futures market will not be the best for everyone in all situations, but the marketing technique offers sufficient advantages. Therefore, it should be understood and considered by all grain producers.

The Long Hedge

The long hedge is used to provide protection against rising prices. It is the type of hedge that is appropriate for most grain users when they decide to use the futures markets to lock in a price. Grain users may include poultry and livestock producers, feed mills, processing facilities, or elevators which will later resell the purchased grain. These grain users may also be grain producers who do not anticipate sufficient production to meet their needs. A long hedge begins at the time a producer buys a futures contract, and then resells it when the hedge is lifted and the cash grain is purchased. Although it is possible to actually accept delivery of grain to satisfy the contract, the majority of long hedgers will offset their initial long futures position by reselling the contract.

As long as a grain user purchases the physical grain, the following formula will allow him or her to predict the effective purchase price:

Futures price (when initially purchased)	
+ Ending basis	
+ Commissions paid	
+ Interest expense	
Effective Purchase Price	

Since the hedge is placed before the ending basis is known, it is necessary to predict the ending basis. Many long hedgers will use the average basis of the last 5 years. If the actual ending basis is larger (more positive or less negative) than predicted, the effective purchase price will be higher than predicted. Conversely, if the actual ending basis is less (less positive or more negative) than predicted, the effective purchase price will be lower than expected. Since basis is much easier to predict than price, risk is lessened.

An example may make the formula easier to understand. The price of a CBT December corn futures is \$2.87 per bushel for a 5,000-bushel contract. The grain user expects to buy 20,000 bushels of corn and estimates local cash prices to be 15 cents above the December futures in October (basis equals 15 cents when the corn is purchased). Assume that commission costs are 2 cents per bushel per roundturn, and interest expense on margin money is 1 cent per bushel. The grain user would buy four December futures contracts to be fully protected. For simplicity, everything will be computed on a per bushel basis. The long hedger's predicted effective purchase price would be computed as follows:

Futures price	=	\$2.87
+ Ending Basis	=	0.15
+ Commissions	=	0.02
+ Interest	=	0.01
Effective purchase price		= \$3.05

The price this grain user will pay will be \$3.05, subject to his or her ability to predict basis accurately, as long as the grain user's plans do not change regarding the purchase of 20,000 bushels of corn. If the basis in October actually ends up being 17 cents, the effective purchase price will be \$3.07, whereas if the basis actually ends up being 12 cents, the price will be \$3.02.

If the December futures price is \$3.25, and the local cash price is \$3.40, the effective purchase price would be \$3.05. The grain user would make \$0.35 in the futures market (\$3.25 futures price when sold, minus \$2.87 futures price when purchased, minus \$0.02 commission costs, minus \$0.01 interest costs). The \$0.35 profit from futures market transactions would then be used to reduce the \$3.40 cash purchase price, netting an effective purchase price of \$3.05.

Suppose the December futures price is \$2.50, and the local cash price is \$2.65. The effective purchase price would be \$3.05. The grain user would lose \$0.40 in the futures market (\$2.50 futures price when sold, minus \$2.87 futures price when purchased, minus \$0.02 commission costs, minus \$0.01 interest costs). The \$0.40 loss from futures market transactions would then be added to the \$2.65 local cash price to arrive at the effective purchase price of \$3.05. Hence, in the second example, hedging the grain had the advantage of locking in a price, but the disadvantage of raising the net price paid.

Suppose the long hedger, for whatever reason, decides against purchasing the cash grain. If October cash prices end up being \$2.65 with a basis of \$0.15, the hedger will lose \$0.40 per bushel because of his or her futures transactions. If October cash prices end up being \$3.40 with a basis of \$0.15, the producer will earn \$0.35 per bushel hedged.

Since grain users tend to operate on a continuous schedule, the distinction between a harvest hedge and a storage hedge is not often made. However, if the amount of grain hedged is not purchased, then returns from futures transactions must be computed. The formula for computing the returns per bushel from futures transactions is:

Futures returns = futures price when
the contract is sold, minus futures price
when the contract is purchased, minus
commissions, minus interest expense.

Long and Multiple Hedging

As in short hedging, a number of multiple hedging strategies can be used with long hedging strategies, to tell a hedger when to place and lift a hedge. A long hedger using multiple hedging will place a long hedge when he or she believes prices will rise, and will remove the hedge when prices are expected to fall. A multiple hedger may place a long hedge and then lift it, place it again, and then lift it again several times during the procurement year.

Multiple hedging is not used as frequently by the long hedger as by the short hedger. Because of the nature of most grain user's operations, many simply will not accept price risks—even for relatively short periods of time. Hence, use of multiple hedging techniques by the long hedger is not as important.

Long Hedge: Advantages and Disadvantages

The long hedge has advantages and disadvantages as a marketing strategy, similar to those listed for a short hedge. Of course, they are expressed in terms of a grain purchaser, not a seller. It is important for all major and minor grain users to be familiar with long hedging techniques.

Hedging Hints

For the novice short or long hedger, a few hints may prove helpful.

- *Begin slowly.* The hedger should follow the futures markets closely and practice trading on paper before risking his or her money. He or she should not hedge an entire production at the initial hedging stage.
- *Do not feel bad when the highest or lowest price is not received.* No one ever went broke pricing grain at a profit. No one can consistently choose market tops and bottoms. The purpose of hedging with the futures markets is to shift price risk and receive an acceptable price.
- *Do not speculate.* Some producers have the tendency to become futures speculators after making a few profitable futures transactions. Some farms have been lost in this manner. Speculation is only for seasoned professionals who can withstand the financial risks.
- *Communicate hedging plans to lenders and to family, and make sure they understand.* Failure to do so can result in a shortage of funds to meet margin calls and unnecessary stress.
- *Make your own decisions.* Although brokers, market analysts and consultants can provide useful information, the hedger faces the financial risks and is responsible for any decision.
- *Make a written marketing plan and follow it.* Emotions can play a big and unfortunate part in marketing decisions. Marketing plans promote objectivity. Fact Sheet 484 explains marketing plans in greater detail.
- *Learn everything about the futures markets.* Follow the markets, attend marketing seminars, and read informational materials.

Margin Mechanics

Usage of the futures markets requires the grain marketer to meet margin requirements. Hence, it is essential that grain marketers have a thorough understanding of futures margins. A lack of understanding can cause unnecessary stress in the best scenario, or can force a grain marketer to lift his or her hedge in the worst scenario.

Exchanges require that potential futures traders deposit money in an account (initial margin) to ensure the financial integrity of a transaction. The exchanges also require that a trader maintain a specified level of funds and/or equity (maintenance margin) in the account to maintain his or her futures position. In the event that the funds or equity should drop below these minimums, the trader's futures account will be closed.

Although the specific futures exchange which the trader is using will establish minimum initial and maintenance margin requirements, individual brokerage houses will typically increase these requirements. In general, the margin requirements for hedgers is less than the margin requirements for speculators. Currently, the margin requirements for corn traded on the CBT are an initial margin of \$1,500 and a maintenance margin of \$1,200 for each 5,000-bushel contract. The current margin requirements for a CBT soybean contract (5,000 bushels) are an initial margin of \$4,500 and a maintenance margin of \$3,750. Requirements of individual brokerage houses will be different and should be compared when choosing a broker. Examples should make the actual mechanics of margins easier to understand.

Example 1. A corn producer sold one CBT corn contract at \$2.87 on July 27, 1988. Assume that the initial margin requirement was \$1,500 and the maintenance margin was \$1,200. Assume further that price increased to \$2.89 on July 28, to \$2.91 on July 29, and to \$2.94 on August 1 (the next trading day). The margin transactions are shown in Table 1.

Since the marketer sold a futures contract, equity declined in the futures account as prices rose. Each 1 cent rise in futures prices resulted in a \$50 loss in equity (5,000 bushels X \$0.01). By August 1, prices had risen 7 cents. This represents a \$350 equity loss, and dropped the producer below his or her maintenance margin. At this point, the trader was required to deposit sufficient funds to bring the margin account balance back up to at least the initial margin requirement. Had this trader been unable to come up with the \$350, his or her account would have been closed.

Table 1. Margin transactions on selling one Chicago Board of Trade (CBT) corn contract

Date	Price	Beginning Balance	Gain or Loss	Additional Margin Deposited	Ending Balance
7/27	\$2.87	N/A	N/A	\$1,500	\$1,500
7/28	2.89	\$1,500	-100	0	1,300
7/29	2.91	1,400	-100	0	1,300
8/01	2.94	1,300	-150	350	1,500

Example 2. A soybean user bought one CBT soybean contract at a price of \$7.64 on July 27, 1988. Assume that the initial margin requirement was \$4,500 and the maintenance margin was \$3,750. Assume further that the price decreased to \$7.54 on July 28, to \$7.51 on July 29, and to \$7.44 on August 1. The margin transactions are shown in Table 2.

Since the trader bought a futures contract, equity declined in the futures account as prices fell. Each 1

cent fall in futures prices resulted in a \$50 loss in equity (5,000 bushels X \$0.01). By August 1, prices had dropped 20 cents. This represents a \$1,000 equity loss, and dropped the producer below his or her maintenance margin. At this point, the trader was required to deposit sufficient funds to bring the margin account balance back up to at least the initial margin requirement. Had this trader been unable to come up with the \$1,000, his or her account would have been closed.

Table 2. Margin transactions on buying one Chicago Board of Trade (CBT) soybean contract

Date	Price	Beginning Balance	Gain or Loss	Additional Margin Deposited	Ending Balance
7/27	\$7.64	N/A	N/A	\$4,500	\$4,500
7/28	7.54	\$4,500	-500	0	4,000
7/29	7.51	4,000	-150	0	3,850
8/01	7.44	3,850	-350	1,000	4,500

Buyers and sellers of futures contracts will face margin calls if futures prices move adversely. Grain marketers using the futures markets as a marketing alternative should make arrangements with lenders to meet these margin calls if cash is not readily available.

Summary

This fact sheet discussed terminology commonly used by grain marketers when they employ the futures markets to hedge grain. It described the hedging process, the mechanics of computing margin requirements, and presented information on the short and long hedge. Also, it offered some hedging hints for the novice marketer.

This fact sheet did not discuss specific strategies for hedging grain. The reader, however, is encouraged to study hedging strategies in more detail, and to gain the expertise in successfully using them.

The desirability of hedging with the futures markets depends on a number of factors. The willingness and ability of grain marketers to accept risk will have an impact on the desirability of using futures hedging. The market outlook is especially important in evaluating the appropriateness of hedging. The level of marketing knowledge and expertise of the producer, his or her financial needs, and the predictability of production will also influence the hedging decision. The futures markets provide benefits and flexibility that are difficult to match with other alternatives. In many situations, they can provide the opportunity to increase returns from grain marketing, and decrease—or at least manage—the associated risk.

The futures markets are not a new grain marketing alternative. However, they do offer opportunities which too few grain producers have taken advantage of, and even fewer have used to their maximum potential. Non-use of this marketing alternative will lessen the producer's opportunities for available returns, and increase his or her risks. Grain producers, who are good grain marketers, will be familiar with the marketing alternatives offered by the futures markets.

This Extension fact sheet is one in a series of grain marketing fact sheets. The series is designed to cover many topics essential to effective grain marketing. Other fact sheets in the series are:

FS 484 Developing a Grain Marketing Plan
FS 485 Grain Marketing: Using Balance Sheets
FS 486 Grain Marketing: Helpful Hints
FS 487 Grain Marketing: Storage Decisions
FS 489 Understanding Grain Basis
FS 490 Grain Marketing Alternatives
FS 491 Grain Futures: Questions and Answers
FS 492 Grain Marketing: Using Options
FS 493 Evaluating Grain Marketing Alternatives
FS 494 Crop Pricing Summary
FS 495 Maryland Corn: Historical Basis and Price Information
FS 496 Maryland Soybeans: Historical Basis and Price Information
FS 497 Maryland Wheat: Historical Basis and Price Information
FS 498 Producers' Guide to Grain Marketing Terminology

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