

HEDGING WITH AGRICULTURAL FUTURES

Strengthen your trading knowledge and learn how to hedge with agricultural futures and options on futures



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When analyzing option strategies, it is important to take into account the commission and fees associated with making a trade. Similar to trading futures, each contract executed in an option strategy is charged commission and fees. Commissions and fees from brokerage firms can be up to \$99 per round turn with the vast majority of people paying significantly less. Your actual charges may vary based on the service level you choose. The two primary factors investors tend to overlook when trading options include:

- Each contract traded is charged a commission. This is often misinterpreted as each spread or strategy that is charged a commission. If you trade one bull call spread, your account would be charged for 2 contracts rather than 1 spread.
- Customers often try to sell or collect premium on options that are far out of the money with the belief that they are collecting "easy money." The further away an option strike price is from the current market price, the lower the value of the option. Make sure that you are not paying more in commission and fees than what you are collecting. Keep in mind that until an option expires, you do hold risk in the positions. Is the net premium collected after paying commission and fees worth the risk?



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Chapter One

The Markets

Market Participants

Futures market participants fall into two general categories: hedgers and speculators. Futures markets exist primarily for hedging, which is defined as the management of price risks inherent in the ownership and transaction of commodities.

The word hedge means protection. The dictionary states that to hedge is “to try to avoid or lessen a loss by making counterbalancing investments...” In the context of futures trading, that is precisely what a hedge is: a counterbalancing investment involving a position in the futures market that is opposite one’s position in the cash market. Since the cash market price and futures market price of a commodity tend to move up and down together, any loss or gain in the cash market will be roughly offset or counterbalanced in the futures market. Hedgers include:

- Farmers, livestock producers—who need protection against declining prices for crops or livestock, or against rising prices of purchased inputs such as feed;
- merchandisers, elevators—who need protection against lower prices between the time they purchase or contract to purchase grain from farmers and the time it is sold;
- food processors, feed manufacturers—who need protection against increasing raw material costs or against decreasing inventory values;
- exporters—who need protection against higher prices for grain contracted for future delivery but not yet purchased; and
- importers—who want to take advantage of lower prices for grain contracted for future delivery but not yet received.

Since the number of individuals and firms seeking protection against declining prices at any given time is rarely the same as the number seeking protection against rising prices, other market participants are needed. These participants are known as speculators.

Speculators facilitate hedging by providing liquidity—the ability to enter and exit the market quickly, easily and efficiently. They are attracted by the opportunity to realize a profit if they prove to be correct in anticipating the direction and timing of price changes.

These speculators may be part of the general public or they may be floor traders—members of the exchange operating in one of the trading pits. Floor traders are noted for their willingness to buy and sell on even the smallest of price changes. Because of this a seller can, at almost any time, find a buyer at or near the most recently quoted price. Similarly, buyers can find willing sellers without having to significantly bid up the price.



Chapter Two

Hedging with Futures and Basis

Hedging is based on the principle that cash market prices and futures market prices tend to move up and down together. This movement is not necessarily identical, but it usually is close enough that it is possible to lessen the risk of a loss in the cash market by taking an opposite position in the futures market. Taking opposite positions allows losses in one market to be offset by gains in the other. In this manner, the hedger is able to establish a price level for a cash market transaction that may not actually take place for several months.

The Short Hedge

To give you a better idea of how hedging works, let's suppose it is May and you are a soybean farmer with a crop in the field; or perhaps an elevator operator with soybeans you have purchased but not yet sold. In market terminology, you have a long cash market position. The current cash market price for soybeans to be delivered in October is \$6.00 per bushel. If the price goes up between now and October, when you plan to sell, you will gain. On the other hand, if the price goes down during that time, you will have a loss.

To protect yourself against a possible price decline during the coming months, you can hedge by selling a corresponding number of bushels in the futures market now and buying them back later when it is time to sell your crops in the cash market. If the cash price declines by harvest, any loss incurred will be offset by a gain from the hedge in the futures market. This particular type of hedge is known as a short hedge because of the initial short futures position.

With futures, a person can sell first and buy later or buy first and sell later. Regardless of the order in which the transactions occur, buying at a lower price and selling at a higher price will result in a gain on the futures position.

Selling now with the intention of buying back at a later date gives you a short futures market position. A price

decrease will result in a futures gain, because you will have sold at a higher price and bought at a lower price.

For example, let's assume cash and futures prices are identical at \$6.00 per bushel. What happens if prices decline by \$1.00 per bushel? Although the value of your long cash market position decreases by \$1.00 per bushel, the value of your short futures market position increases by \$1.00 per bushel. Because the gain on your futures position is equal to the loss on the cash position, your net selling price is still \$6.00 per bushel.

| | Cash Market | Futures Market |
|--------------------------|---------------------------------|--|
| May | cash soybeans are \$9.00/bu | sell Nov. soybean futures at \$9.00/bu |
| Oct. | sell cash soybeans at \$8.00/bu | buy Nov. soybean futures at \$8.00/bu |
| Change | \$1.00/bu loss | \$1.00/bu gain |
| sell cash soybeans at | | \$8.00/bu |
| loss on futures position | | +\$1.00/bu* |
| net selling price | | \$9.00/bu |

Note: When hedging, you use the futures contract month closest to the time, but not after, you plan to purchase or sell the physical commodity.

*Does not include transaction fees.

What if soybean prices had instead risen by \$1.00 per bushel? Once again, the net selling price would have been \$9.00 per bushel, as a \$1.00 per bushel loss on the short futures position would be offset by a \$1.00 per bushel gain on the long cash position.



Notice in both cases the gains and losses on the two market positions cancel out each other. That is, when there is a gain on one market position, there is a comparable loss on the other. This explains why hedging is often said to “lock in” a price level.

| | Cash Market | Futures Market |
|---------------|----------------------------------|--|
| May | cash soybeans are \$9.00/bu | sell Nov. soybean futures at \$9.00/bu |
| Oct. | sell cash soybeans at \$10.00/bu | buy Nov. soybean futures at \$10.00/bu |
| Change | \$1.00/bu loss | \$1.00/bu gain |
| | sell cash soybeans at | \$7.00/bu |
| | loss on futures position | -\$1.00/bu |
| | net purchase price | \$6.00/bu |

In both instances, the hedge accomplished what it set out to achieve: It established a selling price of \$9.00 per bushel for soybeans to be delivered in October. With a short hedge, you give up the opportunity to benefit from a price increase to obtain protection against a price decrease.

The Long Hedge

On the other hand, livestock feeders, grain importers, food processors, and other buyers of agricultural products often need protection against rising prices and would instead use a long hedge involving an initial long futures position. For example, assume it is July and you are planning to buy corn in November. The cash market price in July for corn delivered in November is \$2.50 per bushel, but you are concerned that by the time you make the purchase, the price may be much higher. To protect yourself against a possible price increase, you buy December corn futures at \$2.50 per bushel. What would be the outcome if corn prices increase 50 cents per bushel by November?

In this example, the higher cost of corn in the cash market was offset by a gain in the futures market. Conversely, if corn prices decreased by 50 cents per bushel by November, the lower cost

of corn in the cash market would be offset by a loss in the futures market. The net purchase price would still be \$3.50 per bushel.

| | Cash Market | Futures Market |
|---------------|----------------------------|-------------------------------------|
| July | cash corn is \$3.50/bu | buy Dec. corn futures at \$3.50/bu |
| Nov. | buy cash corn at \$4.00/bu | sell Dec. corn futures at \$4.00/bu |
| Change | \$0.50/bu loss | \$0.50/bu gain |
| | buy cash corn at | \$4.00/bu |
| | gain on futures position | -\$0.50/bu |
| | net purchase price | \$3.50/bu |

Remember, whether you have a short hedge or a long hedge, any losses on your futures position may result in a margin call from your broker, requiring you to deposit additional funds to your margin account. As previously discussed, adequate funds must be maintained in the account to cover day-to-day losses. However, keep in mind that if you are incurring losses on your futures market position, then it is likely that you are incurring gains on your cash market position.

| | Cash Market | Futures Market |
|---------------|----------------------------|-------------------------------------|
| July | cash corn is \$3.50/bu | buy Dec. corn futures at \$3.50/bu |
| Nov. | buy cash corn at \$3.00/bu | sell Dec. corn futures at \$3.00/bu |
| Change | \$0.50/bu gain | \$0.50/bu loss |
| | buy cash corn at | \$3.00/bu |
| | loss on futures position | +\$0.50/bu |
| | net purchase price | \$3.50/bu |

Basis: The Link between Cash and Futures Prices

All of the examples just presented assumed identical cash and futures prices. But, if you are in a business that involves buying or selling grain or oilseeds, you know the cash price in your area or what your supplier quotes for a given commodity usually differs from the price quoted in the futures market. Basically, the local cash price for a commodity is the futures price adjusted for such variables as freight, handling, storage and quality, as well as the local supply and demand factors. The price difference between the cash and futures prices may be slight or it may be substantial, and the two prices may not always vary by the same amount.

This price difference (cash price - futures price) is known as the **basis**.



A primary consideration in evaluating the basis is its potential to strengthen or weaken. The more positive (or less negative) the basis becomes, the stronger it is. In contrast, the more negative (or less positive) the basis becomes, the weaker it is. For example, a basis change from 10 cents under (a cash price \$.10 less than the futures price) to a basis of 5 cents under (a cash price \$.05 less than the futures price) indicates a strengthening basis, even though the basis is still negative. On the other hand, a basis change from 20 cents over (a cash price \$.20 more than the futures price) to a basis of 15 cents over (a cash price

\$.15 more than the futures price) indicates a weakening basis, despite the fact that the basis is still positive. (Note: Within the grain industry a basis of 15 cents over or 15 cents under a given futures contract is usually referred to as “15 over” or “15 under.” The word “cents” is dropped.) Basis is simply quoting the relationship of the local cash price to the futures price.

Basis and the Short Hedger

Basis is important to the hedger because it can affect the final outcome of a hedge. For example, suppose it is March and you plan to sell wheat to your local elevator in mid-June. The July wheat futures price is \$5.00 per bushel, and the cash price in your area in mid-June is normally about 35 under the July futures price.

| | Cash Market | Futures Market | Basis |
|---------------|--|-------------------------------------|-------|
| March | expected cash wheat price is \$4.65/bu | sell Jul wheat futures at \$5.00/bu | -.35 |
| June | sell cash wheat at \$4.15/bu | buy Jul wheat futures at \$4.50/bu | -.35 |
| Change | \$0.50/bu loss | \$0.50/bu gain | 0 |
| | sell cash wheat at \$4.15/bu | gain on futures position +\$0.50/bu | |
| | net selling price | \$4.65/bu | |

The approximate price you can establish by hedging is \$4.65 per bushel (\$5.00 - \$.35) provided the basis is 35 under. The previous table shows the results if the futures price declines to \$3.00 by June and the basis is 35 under. Suppose, instead, the basis in mid-June had turned out to be 40 under rather than the expected 35 under. Then the net selling price would be \$4.50, rather than \$4.65.



| | Cash Market | Futures Market | Basis |
|---------------|--|-------------------------------------|-------|
| March | expected cash wheat price is \$4.65/bu | sell Jul wheat futures at \$5.00/bu | -.35 |
| June | sell cash wheat at \$4.10/bu | buy Jul wheat futures at \$4.50/bu | -.35 |
| Change | \$0.55/bu loss | \$0.50/bu gain | -.05 |
| | sell cash wheat at \$4.10/bu | gain on futures position +\$0.50/bu | |
| | net selling price | \$4.60/bu | |

This example illustrates how a weaker-than-expected basis reduces your net selling price. And, as you might expect, your net selling price increases with a stronger-than-expected basis. Look at the following example. As explained earlier, a short hedger benefits from a strengthening basis. This information is important to consider when hedging. That is, as a short hedger, if you like the current futures price and expect the basis to strengthen; you should consider hedging a portion of your crop or inventory as shown in the next table. On the other hand, if you expect the basis to weaken and would benefit from today's prices, you might consider selling your commodity now.

| | Cash Market | Futures Market | Basis |
|---------------|--|-------------------------------------|-------|
| March | expected cash wheat price is \$4.65/bu | sell Jul wheat futures at \$5.00/bu | -.35 |
| June | sell cash wheat at \$4.25/bu | buy Jul wheat futures at \$4.50/bu | -.25 |
| Change | \$0.40/bu loss | \$0.50/bu gain | .10 |
| | sell cash wheat at \$4.25/bu | gain on futures position +\$0.50/bu | |
| | net selling price | \$4.75/bu | |

Basis and the Long Hedger

How does basis affect the performance of a long hedge? Let's look first at a livestock feeder who in October is planning to buy soybean meal in April. May soybean meal futures are \$270 per ton and his local basis in April is typically \$20 over the May futures price, for an expected purchase price of \$290 per ton (\$270 + \$20). If the futures price increases to \$300 by April and the basis is \$20 over, the net purchase price remains at \$290 per ton.

| | Cash Market | Futures Market | Basis |
|---------------|---|--|-------|
| Oct | expected cash soybean meal futures price is \$290/ton | buy May soybean meal futures at \$270/ton | +\$20 |
| April | buy cash soybean meal futures at \$320/ton | sell May soybean meal futures at \$4.50/bu | +\$20 |
| Change | \$30/ton loss | \$30/ton gain | 0 |
| | buy cash soybean meal at \$320/ton | gain on futures position -\$30/ton | |
| | net selling price | \$290/ton | |

What if the basis strengthens—in this case, more positive—and instead of the expected \$20 per ton over, it is actually \$40 per ton over in April? Then the net purchase price increases by \$20 to \$310.



| | Cash Market | Futures Market | Basis |
|---------------|---|--|-------|
| Oct | expected cash soybean meal futures price is \$290/ton | buy May soybean meal futures at \$270/ton | +\$20 |
| April | buy cash soybean meal futures at \$340/ton | sell May soybean meal futures at \$300/ton | +\$40 |
| Change | \$50/ton loss | \$30/ton gain | -\$20 |
| | buy cash soybean meal at \$340/ton | gain on futures position -\$30/ton | |
| | net selling price | \$310/ton | |

Conversely, if the basis weakens moving from \$20 over to \$10 over, the net purchase price drops to \$280 per ton (\$310 - \$30). Notice how long hedgers benefit from a weakening basis—just the opposite of a short hedger. What is important to consider when hedging is basis history and market expectations. As a long hedger, if you like the current futures price and expect the basis to weaken; you should consider hedging a portion of your commodity purchase. On the other hand, if you expect the basis to strengthen and like today's prices, you might consider buying your commodity now.

| | Cash Market | Futures Market | Basis |
|---------------|---|--|-------|
| Oct | expected cash soybean meal futures price is \$290/ton | buy May soybean meal futures at \$270/ton | +\$20 |
| April | buy cash soybean meal futures at \$320/ton | sell May soybean meal futures at \$300/ton | +\$20 |
| Change | \$20/ton loss | \$30/ton gain | \$10 |
| | buy cash soybean meal at \$310/ton | gain on futures position -\$30/ton | |
| | net selling price | \$280/ton | |

Hedging with futures offers you the opportunity to establish an approximate price months in advance of the actual sale or purchase and protects the hedger from unfavorable price changes. This is possible because cash and futures prices tend to move in the same direction and by similar amounts, so losses in one market can be offset with gains in the other. Although the futures hedger is unable to benefit from favorable price changes, you are protected from unfavorable market moves. Basis risk is considerably less than price risk, but basis behavior can have a significant impact on the performance of a hedge. A stronger-than-expected basis will benefit a short hedger, while a weaker-than-expected basis works to the advantage of a long hedger.

| Basis Change | Stronger | Weaker |
|--------------------|-------------|-------------|
| Short Hedge | Favorable | Unfavorable |
| Long Hedge | Unfavorable | Favorable |



Importance of Historical Basis

By hedging with futures, buyers and sellers are eliminating futures price level risk and assuming basis level risk. Although it is true that basis risk is relatively less than the risk associated with either cash market prices or futures market prices, it is still a market risk. Buyers and sellers of commodities can do something to manage their basis risk. Since agricultural basis tends to follow historical and seasonal patterns, it makes sense to keep good historical basis records. The table below is a sample of a basis record. Although there are numerous formats available, the content should include: date, cash market price, futures market price (specify contract month), basis and market factors for that date. This information can be put into a chart format as well.

Basis Table Notes:

1. The most common type of basis record will track the current cash market price to the nearby futures contract month price. It is a good practice to switch the nearby contract month to the next futures contract month prior to entering the delivery month. For example, beginning with the second from last business day in November, switch tracking from December corn futures to the March corn futures (the next contract month in the corn futures cycle).
2. It is common to track basis either daily or weekly. If you choose to keep track of basis on a weekly schedule, be consistent with the day of the week you follow. Also, you may want to avoid tracking prices and basis only on Mondays or Fridays.
3. Basis tables will help you compare the current basis with the expected basis at the time of your purchases or sales. In other words, it will help determine if a supplier's current offer or an elevator's current bid is stronger or weaker than expected at the time of the purchase or sale.
4. Putting basis information from multiple years on a chart will highlight the seasonal and historical patterns. It will also show the historical basis range (strongest and weakest levels) for any given time period.

| Date | Cash Price | Futures Price/Month | Basis | Market Factors |
|----------|------------|---------------------|-------------|--|
| 10/02/03 | \$3.60 | \$3.77 Dec. | -\$0.17 (Z) | Extended local dry spell in forecast |
| 10/03/03 | \$3.70 | \$3.95 Dec. | -\$0.25 (Z) | Report of stronger than expected exports |

**Z is the ticker symbol for December futures*



Chapter Three

Futures Hedging Strategies for Buying and Selling Commodities

Now that you have a basic understanding of how futures contracts are used to manage price risks and how basis affects your buying and selling decisions, it is time to try your hand at a few strategies. Upon completing this chapter, you should be able to:

- recognize those situations when you will benefit most from hedging
- calculate the dollars and cents outcome of a given strategy, depending on market conditions
- understand the risks involved with your marketing decisions

The strategies covered in this chapter include:

- buying futures for protection against rising commodity prices
- selling futures for protection against falling commodity prices

To review some of the points from the preceding chapter, hedging is used to manage your price risks. If you are a buyer of commodities and want to hedge your position, you would initially buy futures contracts for protection against rising prices. At a date closer to the time you plan to actually purchase the physical commodity, you would offset your futures position by selling back the futures contracts you initially bought. This type of hedge is referred to as a long hedge. Long hedgers benefit from a weakening basis.

On the other hand, if you sell commodities and need protection against falling prices, you would initially sell futures contracts. At a date closer to the time you price the physical commodity, you would buy back the futures contracts you initially sold. This is referred to as a short

hedge. Short hedgers benefit from a strengthening basis.

The following strategies are examples of how those in agribusiness use futures contracts to manage price risks. Also, note how basis information is used in making hedging decisions and how changes in the basis affect the final outcome.

Buying Futures for Protection against Rising Prices

Assume you are a feed manufacturer and purchase corn on a regular basis. It is December and you are in the process of planning your corn purchases for the month of April—wanting to take delivery of the corn during mid-April. Several suppliers in the area are offering long-term purchase agreements, with the best quote among them of 5 cents over May futures. CBOT May futures are currently trading at \$3.75 per bushel, equating to a cash forward offer of \$3.80 per bushel.

If you take the long-term purchase agreement, you will lock in the futures price of \$3.75 per bushel and a basis of 5 cents over, or a flat price of \$3.80 per bushel. Or, you could establish a futures hedge, locking in a futures price of \$3.75 per bushel but leaving the basis open.

In reviewing your records and historical prices, you discover the spot price of corn in your area during mid-April averages 5 cents under the May futures price. And, based on current market conditions and what you anticipate happening between now and April, you believe the mid-April basis will be close to 5 cents under.



Action

Since you like the current futures price but anticipate the basis weakening, you decide to hedge your purchase using futures rather than entering into a long-term purchase agreement. You purchase the number of corn contracts equal to the amount of corn you want to hedge. For example, if you want to hedge 15,000 bushels of corn, you buy (go “long”) 3 corn futures contracts because each contract equals 5,000 bushels.

By purchasing May corn futures, you lock in a purchase price of \$3.80 if the basis remains unchanged (futures price of \$3.75 + the basis of \$.05 over). And, if the basis weakens, you will benefit from any basis appreciation. Of course, you realize the basis could surprise you and strengthen, but, based on your records and market expectations, you feel it is in your best interest to hedge your purchases.

Prices Increase Scenario

If the price increases and the basis remains unchanged at 5 cents over, you will purchase corn at \$3.80 per bushel (futures price of \$3.75 + the basis of \$.05 over). But if the price increases and the basis weakens, the purchase price is reduced.

Assume by mid-April, when you need to purchase the physical corn, the May futures price has increased to \$4.25 and the best offer for physical corn in your area is \$4.20 per bushel (futures price - the basis of \$.05 under).

With the futures price at \$4.25, the May corn futures contract is sold back for a net gain of 50 cents per bushel ($\$4.25 - \3.75). That amount is deducted from the current local cash price of corn, \$4.20 per bushel, which equals a net purchase price of \$3.70. Notice the price is 10 cents lower than what you would have paid for corn through a long-term purchase agreement. The lower price is a result of a weakening of the basis, moving from 5 cents over to 5 cents under May futures.

Price Decrease Scenario

If prices decrease and the basis remains unchanged, you will still pay \$3.80 per bushel for corn. Hedging with futures provides

protection against rising prices, but it does not allow you to take advantage of lower prices. In making the decision to hedge, one is willing to give up the chance to take advantage of lower prices in return for price protection. On the other hand, the purchase price will be lower if the basis weakens.

Assume by mid-April the May futures price is \$3.45 per bushel and the best quote offered by an area supplier is also \$3.45 per bushel. You purchase corn from the supplier and simultaneously offset your futures position by selling back the futures contracts you initially bought.

| | Cash Market | Futures Market | Basis |
|--------------------------|------------------------------|------------------------------------|-------|
| Dec | long-term offer at \$3.80/bu | buy May corn futures at \$3.75/bu | +.05 |
| April | buy cash corn at \$4.20/bu | sell May corn futures at \$4.25/bu | +.10 |
| Change | \$.40/bu loss | \$.50/bu gain | +.10 |
| buy cash soybean meal at | | \$4.20/bu | |
| gain on futures position | | -\$.50/bu | |
| net selling price | | \$3.70/bu | |

Even though you were able to purchase cash corn at a lower price, you lost 30 cents on your futures position. This equates to a net purchase price for corn of \$3.75. The purchase price is still 5 cents lower than what you would have paid for corn through a long-term purchase agreement. Again, this difference reflects a weakening of the basis from 5 cents over to even (no basis).

In hindsight, you would have been better off neither taking the long-term purchase agreement nor hedging because prices fell. But your job is to purchase corn, add value to it, and sell the final product at a profit. If you don't do anything to manage price risk, the result could be disastrous to your firm's bottom line. Back in December, you evaluated the price of corn, basis

records, and your firm's expected profits based upon that information. You determined by hedging and locking in the price for corn your firm could earn a profit. You also believed the basis would weaken, so you hedged to try and take advantage of a weakening basis. Therefore, you accomplished what you intended. The price of corn could just as easily have increased.

| | Cash Market | Futures Market | Basis |
|---------------|------------------------------|------------------------------------|-------|
| Dec | long-term offer at \$3.80/bu | buy May corn futures at \$3.75/bu | +05 |
| April | buy cash corn at \$3.45/bu | sell May corn futures at \$3.45/bu | 0 |
| Change | \$0.35/bu gain | \$0.30/bu loss | +05 |
| | buy cash corn at | \$3.45/bu | |
| | loss on futures position | +\$0.30/bu | |
| | net purchase price | \$3.75/bu | |

| | Cash Market | Futures Market | Basis |
|---------------|------------------------------|------------------------------------|-------|
| Dec | long-term offer at \$3.80/bu | buy May corn futures at \$3.75/bu | +05 |
| April | buy cash corn at \$4.10/bu | sell May corn futures at \$4.03/bu | +07 |
| Change | \$.30/bu loss | \$.28/bu gain | -.02 |
| | buy cash corn at | \$4.10/bu | |
| | gain on futures position | -\$0.28/bu | |
| | net purchase price | \$3.82/bu | |

As we've seen in the preceding examples, the final outcome of a futures hedge depends on what happens to basis between the time a hedge is initiated and offset. In those scenarios, you benefitted from a weakening basis. In regard to other marketing alternatives, you may be asking yourself, how does futures hedging compare? Suppose you had entered a long-term purchase agreement instead of hedging? Or maybe you did nothing at all— what happens then?

Prices Increase/Basis Strengthens Scenario

If the price rises and the basis strengthens, you will be protected from the price increase by hedging but the strengthening basis will increase the final net purchase price relative to the long-term purchase agreement.

Assume in mid-April your supplier is offering corn at \$4.10 per bushel and the May futures contract is trading at \$4.03 per bushel. You purchase the physical corn and offset your futures position by selling back your futures contracts at \$4.03. This provides you with a futures gain of 28 cents per bushel, which lowers the net purchase price. However, the gain does not make up entirely for the higher price of corn. The 2-cent difference between the long-term purchase agreement and the net purchase price reflects the strengthening basis.

| If May Futures price in April is: | April basis | Alternative 1 Do nothing (spot cash price) | Alternative 2 Hedge with futures at \$2.75 | Alternative 3 Long-term purchase agreement at \$2.80 |
|-----------------------------------|-------------|--|--|--|
| \$2.65 | +05 | \$2.70 | \$2.80 | \$2.80 |
| \$2.75 | +05 | \$2.80 | \$2.80 | \$2.80 |
| \$2.85 | +05 | \$2.90 | \$2.80 | \$2.80 |
| \$2.65 | -.05 | \$2.60 | \$2.70 | \$2.80 |
| \$2.75 | -.05 | \$2.70 | \$2.70 | \$2.80 |
| \$2.85 | -.05 | \$2.80 | \$2.70 | \$2.80 |
| \$2.65 | +10 | \$2.75 | \$2.85 | \$2.80 |
| \$2.75 | +10 | \$2.85 | \$2.85 | \$2.80 |
| \$2.85 | +10 | \$2.95 | \$2.85 | \$2.80 |



The table above compares your alternatives illustrating the potential net purchase price under several possible futures prices and basis scenarios.

You cannot predict the future but you can manage it. By evaluating your market expectations for the months ahead and reviewing past records, you will be in a better position to take action and not let a buying opportunity pass you by.

Alternative 1 shows what your purchase price would be if you did nothing at all. While you would benefit from a price decrease you are at risk if prices

Alternative 2 shows what your purchase price would be if you established a long hedge in December, offsetting the futures position when you purchase physical corn in April. As you can see, a changing basis affects the net purchase price but not as much as a significant price change.

Alternative 3 shows what your purchase price would be if you entered a long-term purchase agreement in December. Basically, nothing affected your final purchase price but you could not take advantage of a weakening basis or lower prices.

Selling Futures for Protection against Falling Prices

Assume you are a corn producer. It is May 15 and you just finished planting your crop. The weather has been unseasonably dry, driving prices up significantly. However, you feel the weather pattern is temporary and are concerned corn prices will decline before harvest.

Currently, December corn futures are trading at \$3.70 per bushel and the best bid on a forward contract is \$3.45 per bushel, or 25 cents under the December futures contract. Your estimated cost of production is \$3.10 per bushel. Therefore, you could lock in a profit of 35 cents per bushel through this forward contract. Before entering into the contract, you review historical prices and basis records and discover the local basis during mid-November is usually about 15 cents under December futures.

Action

Because the basis in the forward contract is historically weak, you decide to hedge using futures. You sell the number of corn contracts equal to the amount of corn you want to hedge. For example, if you want to hedge 20,000 bushels of corn, you sell (go “short”) 4 corn futures contracts because each futures contract equals 5,000 bushels.

By selling December corn futures, you lock in a selling price of \$3.45 if the basis remains unchanged (futures price of \$3.70 - the basis of \$.25). And, if the basis strengthens, you will benefit from any basis appreciation. But remember, there is a chance the basis could actually weaken. So, although you maintain the basis risk, basis is generally much more stable and predictable than either the cash market or futures market prices.

Prices Decrease Scenario

If the price declines and the basis remains unchanged, you are protected from the price decline and will receive \$3.45 per bushel for your crop (futures price of \$3.70 - the basis of \$.25). If the price drops and the basis strengthens, you will receive a higher than expected price for your corn.

By November, the best spot bid in your area for corn is \$3.05 per bushel. Fortunately, you were hedged in the futures market and the current December futures price is \$3.20. When you offset the futures position by buying back the same type and amount of futures contracts as you initially sold, you realize a gain of 50 cents per bushel (\$3.70 - \$3.20). Your gain in the futures market increases your net sales price.

As you can see from the table below, the net sales price is actually 10 cents greater than the forward contract bid quoted in May. This price difference reflects the change in basis, which strengthened by 10 cents between May and November.



| | Cash Market | Futures Market | Basis |
|---------------|-------------------------------------|------------------------------------|-------|
| May | cash forward (Nov) bid at \$3.45/bu | sell Dec corn futures at \$3.70/bu | -.25 |
| Nov | sell cash corn at \$3.05/bu | buy Dec corn futures at \$3.20/bu | -.15 |
| Change | \$.40/bu loss | \$.50/bu loss | +.10 |
| | sell cash corn at \$3.05/bu | | |
| | gain on futures position | +\$.50/bu | |
| | net sales price | \$3.55/bu | |

Price Increase Scenario

If the price increases and the basis remains unchanged, you will still receive \$3.45 per bushel for your crop. That is the futures price (\$3.70) less the basis (\$.25 under). With futures hedging, you lock in a selling price and cannot take advantage of a price increase. The only variable that ultimately affects your selling price is basis. As shown in the following example, you will receive a higher than expected price for your corn if the basis strengthens.

Suppose by mid-November the futures price increased to \$3.90 per bushel and the local price for corn is \$3.70 per bushel. Under this scenario, you will receive \$3.50 per bushel— 5 cents more than the May forward contract bid. In reviewing the table below, you will see the relatively higher price reflects a strengthening basis and is not the result of a price level increase. Once you establish a hedge, the futures price level is locked in. The only variable is basis.

| | Cash Market | Futures Market | Basis |
|---------------|-------------------------------------|------------------------------------|-------|
| May | cash forward (Nov) bid at \$3.45/bu | sell Dec corn futures at \$3.70/bu | -.25 |
| Nov | sell cash corn at \$3.70/bu | buy Dec corn futures at \$3.90/bu | -.20 |
| Change | \$.25/bu gain | \$.20/bu loss | +.05 |
| | sell cash corn at \$3.70/bu | | |
| | loss on futures position | -\$.20/bu | |
| | net sales price | \$3.50/bu | |

If you could have predicted the future in May, more than likely you would have waited and sold your corn in November for \$3.70 per bushel rather than hedging. But predicting the future is beyond your control. In May, you liked the price level and knew the basis was historically weak. Knowing your production cost was \$3.10 per bushel, a selling price of \$3.45 provided you a respectable profit margin.

In both of these examples, the basis strengthened between the time the hedge was initiated and offset, which worked to your advantage. But how would your net selling price be affected if the basis weakened?

Prices Decrease/Basis Weakens Scenario

If the price falls and the basis weakens, you will be protected from the price decrease by hedging but the weakening basis will slightly decrease the final net sales price.

Assume by mid-November, the December futures price is \$3.37 and the local basis is 27 cents under. After offsetting your futures position and simultaneously selling your corn, the net sales price equals \$3.43 per bushel. You will notice the net sales price is 2 cents lower than the forward contract bid in May, reflecting the weaker basis.



| | Cash Market | Futures Market | Basis |
|---------------|-------------------------------------|------------------------------------|-------|
| May | cash forward (Nov) bid at \$3.45/bu | sell Dec corn futures at \$3.70/bu | -.25 |
| Nov | sell cash corn at \$3.10/bu | buy Dec corn futures at \$3.37/bu | -.27 |
| Change | \$.35/bu gain | \$.33/bu loss | -.02 |
| | sell cash corn at \$3.10/bu | | |
| | gain on futures position | +\$.33/bu | |
| | net sales price | \$3.43/bu | |

As we've seen in the preceding examples, the final outcome of a futures hedge depends on what happens to the basis between the time a hedge is initiated and offset. In these scenarios, you benefitted from a strengthening basis.

In regard to other marketing alternatives, you may be asking yourself how does futures hedging compare? Suppose you had entered a forward contract instead of hedging? Or maybe you did nothing—what happens then?

The following table compares your alternatives and illustrates the potential net return under several different price levels and changes to the basis.

You can calculate your net sales price under different futures prices and changes to the basis. Of course, hindsight is always 20/20 but historical records will help you take action and not let a selling opportunity pass you up.

Alternative 1 shows what your net sales price would be if you did nothing at all. While you would benefit from a price increase, you are at risk if the price of corn decreases and at the mercy of the market.

Alternative 2 shows what your net return would be if you established a short hedge in May, offsetting the futures position when you sell your corn in November. As you can see, a changing basis affects the sales price but not as much as a significant price change.

Alternative 3 shows what your net return would be if you cash forward contracted in May. Basically, nothing affected your final sales price, but you could not take advantage of a strengthening basis or higher prices.

| If Dec Futures price in Nov is: | Mid-Nov basis | Alternative 1 Do nothing (spot cash price) | Alternative 2 Hedge with futures at \$2.70 | Alternative 3 cash forward contract at \$2.45 |
|---------------------------------|---------------|---|---|--|
| \$3.60 | -.25 | \$3.35 | \$3.45 | \$3.45 |
| \$3.70 | -.25 | \$3.45 | \$3.45 | \$3.45 |
| \$3.80 | -.25 | \$3.55 | \$3.45 | \$3.45 |
| \$3.60 | -.15 | \$3.45 | \$3.55 | \$3.45 |
| \$3.70 | -.15 | \$3.55 | \$3.55 | \$3.45 |
| \$3.80 | -.15 | \$3.65 | \$3.55 | \$3.45 |
| \$3.60 | -.35 | \$3.25 | \$3.35 | \$3.45 |
| \$3.70 | -.35 | \$3.35 | \$3.35 | \$3.45 |
| \$3.80 | -.35 | \$3.45 | \$3.35 | \$3.45 |



Chapter Four

Option Hedging Strategies for Buying Commodities

Introduction to Risk Management Strategies

The primary purpose of this chapter is to familiarize you with the many different ways in which options on agricultural futures can be used to achieve specific objectives. Upon completion of this section of the course, you should be able to:

- recognize situations in which options can be utilized
- determine the most appropriate option strategy to accomplish a particular goal
- calculate the dollars and cents outcome of any given strategy
- compare options with alternative methods of pricing and risk management such as futures hedging and forward contracting
- explain the risks that may be involved in any particular strategy

The strategies that are covered in Chapters 5 and 6 include:

Strategies for Commodity Buyers

1. Buy futures for protection against rising prices
2. Buy calls for protection against rising prices and opportunity if prices decline
3. Sell puts to lower your purchase price in a stable market
4. Buy a call and sell a put to establish a purchase price range
5. Cash purchase without risk management

Strategies for Commodity Sellers

1. Sell futures for protection against falling prices
2. Buy puts for protection against falling prices and opportunity if prices rally
3. Sell calls to increase your selling price in a stable market
4. Buy a put and sell a call to establish a selling price range
5. Cash sale without risk management

If you could describe options in one word, the word would be versatile. The better you understand options, the more versatile they become. You start to recognize opportunities for using options that otherwise may not have occurred to you. And, of course, the better you understand options, the more skillful you become in using them.

The key to using options successfully is your ability to match an appropriate strategy to a particular objective at a given time—like choosing the right “tool” to do a given job. Naturally, no individual is likely to use all possible option strategies for the simple reason that no individual is likely to have a need for every possible strategy. However, the pages that follow will suggest several situations in which the knowledge you have acquired about options will give you a significant advantage over those who are not familiar with the many benefits they offer.

As we indicated, the attractiveness of options lies in their versatility:

- They can be used for protection against declining prices or against rising prices.



- They can be used to achieve short-term objectives or long-term objectives.
- They can be used conservatively or aggressively.

The strategy discussions in this section are intended to serve a dual purpose. The first is to demonstrate the versatility of options and help you achieve a higher level of familiarity with the mechanics of option trading. The second is to provide a “reference guide” to option strategies so that, as opportunities become available for using options, you can readily refer to the specific strategy or strategies that may be appropriate.

A suggestion: Rather than attempt, at the outset, to become a “master of every strategy,” glance initially at the first paragraph of each strategy discussion, which describes the situation and objective for using the strategy. Then focus your attention on those strategies that seem most pertinent to your business and that correspond most closely to your objectives. You may want to come back to the others later to increase your knowledge of the many ways in which options can be used. You will note that every strategy discussion and illustration is followed by a brief quiz relating specifically to that strategy. This can serve as a useful test of your understanding.

Why Buy or Sell Options?

There are so many things you can do with options that the reasons for buying or selling them are as diversified as the marketplace itself.

In the case of purchasing options, hedgers typically buy them to achieve price protection. If you are worried prices will rise before you have a chance to purchase the physical commodity, you would buy a call option. Call options allow you to establish a ceiling price for a commodity you are planning to purchase. On the other hand, if you are worried prices will fall before you have a chance to sell your physical product or crop, you would buy a put option. Puts allow you to establish a minimum (floor) selling price.

In both cases, you’re not locked in at the ceiling or floor price as you are with futures or forward contracting. If the market

moves in a favorable direction after purchasing an option, you can abandon the option and take advantage of current prices. That is different than a futures hedge, which locks in a specific price. However, the cost of the option is deducted from (or added to) the final sale (or purchase) price.

Selling options is a little different. The reason people sell options can be stated in just a few words: to earn the option premium. This applies to both the writing of calls and of puts. Whether to write a call or a put depends largely on one’s cash market position or price outlook.

Generally, call options are written by those who do not expect a substantial price increase. They may even be bearish in their price expectations. In any case, they hope the underlying futures price will not rise to a level that will cause the option to be exercised. If an option expires without being exercised, the option seller earns the full option premium.

Puts, on the other hand, are generally sold by those who do not expect a substantial decrease in price. They may even have a bullish outlook. They hope the underlying futures price will not fall to a level that will cause the option to be exercised. If the put expires without being exercised, the option seller earns the full option premium.

Instead of waiting, crossing your fingers in the hope an option will not be exercised, an option seller can always offset the option position before it expires. Under this scenario, the option seller would earn the price difference between the sale price and purchase price.

Which Option to Buy or Sell

A common denominator of all option strategies is the need to decide specifically which option to buy or sell: an option with a short time remaining until expiration or with a long time remaining until expiration? An option that is currently out-of-the-money, at-the-money, or in-the-money? Option premiums reflect both the time remaining until expiration and the option strike price relation to the current underlying quoted futures price. It follows that different options, therefore, have different risk-reward characteristics.



Generally, the decision as to which option contract month to buy or sell will be dictated by the time frame of your objective. For example, if it is summer and your objective is to achieve protection against declining soybean prices between now and harvest, you would likely want to purchase a November put option. On the other hand, if it is winter and you want protection from a possible corn price decrease during the spring, you would probably want to purchase a May put option. As we discussed in the “Option Pricing” section of Chapter 4, the longer the time until the option expires, the higher the premium provided all other factors are equal.

When it comes to choosing the option strike price, however, there is no easy rule of thumb. Your decision may be influenced by such considerations as: In your judgment, what is likely to happen to the price of the underlying futures contract? How much risk are you willing to accept? And (if your objective is price protection), would you rather pay a smaller premium for less protection or a larger premium for more protection? Options with a wide range of strike prices provide a wide range of alternatives. Several brief examples, below, illustrate how and why.

Example 1

Assume it is late spring and you would like protection against lower soybean prices at harvest. The November futures price is currently quoted at \$8.75. For a premium of 25 cents, you may be able to purchase a put option that lets you lock in a harvest time selling price of \$8.75 plus your local basis. Or, for a premium of 15 cents, you may be able to buy a put that lets you lock in a harvest time selling price of \$8.50 plus the basis. If prices subsequently decline, the higher-priced option provides you with up to 25 cents more protection; but, if prices rise, the savings on the cost of the lower-priced option will add another 10 cents (the difference in the premiums) to your net selling price. In effect, it is similar to deciding whether to buy an automobile insurance policy with a small deductible or a larger deductible.

Example 2

Assume you decide to purchase a corn call option for protection against a possible spring price increase. If the May futures price

is currently \$3.70 and you pay 8 cents for an out-of-the-money call with a \$3.80 strike price, you will be protected from any price increase above \$3.88 (strike price + premium). But, if you pay a premium of 15 cents for an at-the-money call with a strike price of \$3.70, you will be protected from any price increase above \$3.85 (strike price + premium). The out-of-the-money option, however, is cheaper than the at-the-money option—your out-of-pocket expense is the 8-cent premium (rather than the \$.15 premium) if prices decline rather than increase.

Example 3

In anticipation that wheat prices will remain steady or decrease slightly over the next four 37 months, you decide to sell a call option to earn the option premium. If you are strongly bearish about the price outlook, you might want to earn a premium of 17 cents by writing an at-the-money \$3.40 call. But, if you are only mildly bearish or neutral about the price outlook, you might wish to write an out-of-the-money \$3.50 call at a premium of 13 cents. Although the premium income is less, the out-of-the-money call gives you a 10-cent “cushion” against the chance of rising prices. That is, you would still retain the full 13-cent premium if, at expiration, the futures price had risen to \$3.50.

In each of these illustrations—and, indeed, in every option strategy—the choice is yours. The important thing is to be aware of the choices and how they affect the risks and rewards.

The Buyer of Commodities

Commodity buyers are responsible for the eventual purchase of physical raw commodities (e.g., corn, soybeans, wheat, oats) or derivatives of the raw commodities (e.g., soybean meal, soybean oil, fructose, flour). For example, commodity buyers can be food processors, feed manufacturers, feedlots, livestock producers, grain merchandisers, or importers. They share a common risk—rising prices. Additionally, commodity buyers share a common need—price risk management. The following strategies illustrate a variety of strategies with varying degrees of risk management that can be used by commodity buyers.

Strategy #1: Buying Futures

Protection against Rising Prices

The current time period is mid-summer and you need to purchase wheat during the first half of November. The December wheat futures are trading at \$5.50/bushel. Your business can realize a profit at this price level but may sustain a loss if the prices rally much higher. To lock in this price, you take a long position in December wheat futures. Although, you are protected if the prices move higher, you will not be able to benefit should the prices move to a lower price.

Based on historical basis records in your area, you expect the basis to be about 10 cents under the December wheat futures price. As a buyer of commodities, your purchase price will improve if the basis weakens and worsen if the basis strengthens. For example, if the basis turns out to be stronger at 5 cents under, then your purchase price will be 5 cents higher than expected. If the basis weakens to 20 cents under, then your purchase price will be 10 cents lower than expected.

Action

In August you purchase a December wheat futures contract at \$5.50/bushel.

Expected Purchase Price =

Futures price +/- Expected basis $\$5.50 - .10 = \$5.40/\text{bushel}$

| Long December wheat futures at \$4.50/bushel | | | | |
|--|-------|------------|------------------------------|---------------------|
| If Dec wheat futures are: | Basis | Cash Price | Long futures gain(-)/loss(+) | Actual buying price |
| \$5.00 | -.10 | \$4.90 | +.50 (L) | \$5.40 |
| \$5.25 | -.10 | \$5.15 | +.25 (L) | \$5.40 |
| \$5.50 | -.10 | \$5.40 | 0 | \$5.40 |
| \$5.75 | -.10 | \$5.65 | -.25 (G) | \$5.40 |
| \$6.00 | -.10 | \$5.90 | -.50 (G) | \$5.40 |

Results

Assuming basis turns out to be 10 cents under December futures in November and the December wheat futures move above \$5.50/bushel, the higher price you pay for the physical wheat will be offset by a gain in your futures position. If December wheat futures move below \$5.50/bushel, you will pay a lower price for the physical wheat but you will have a loss on your long futures position. Note the different price scenarios for the November time period. Regardless, if December wheat futures moves higher or lower, the effective purchase price will be \$5.40/bushel provided the basis turns out to be 10 cents under. A change in the basis will affect the purchase price.

Strategy #2: Buying Call Options

Protection against Higher Prices and Opportunity if Prices Decline

Assume you are a buyer who needs to establish a wheat purchase price for November delivery. The time is August and the December wheat futures price is \$5.50 per bushel. At this level, you decide to use options to protect your flour purchase price and related profit margins against a significant rise in the price of wheat. By buying call options you'll be protected from a price increase yet retain the downside opportunity should prices fall between now and November.

The cash market price for wheat in your region is typically about 10 cents below the December futures price during November. This means the normal basis during late fall is 10 cents under, and, given the current market conditions, you expect this to hold true this year. Therefore, if the December futures price in November is \$5.50, the cash price in your suppliers' buying region is expected to be about \$5.40 per bushel.

Premiums for December wheat call and put options are currently quoted as follows:



Expected Buying Price

To compare the price risk exposure for different call option strikes simply use the following formula:

Maximum (ceiling) Buying Price =

Call strike price + premium paid +/- basis

In the current example, the comparison between the \$5.40 call and the \$5.50 call would be:

| Call | + Premium | - Basis | = Ceiling Price |
|--------|-----------|---------|-----------------|
| \$5.40 | + \$.21 | - \$.10 | = \$5.51 |
| \$5.50 | + \$.15 | - \$.10 | = \$5.55 |

As you can see, greater price protection involves a somewhat higher cost.

Action

After considering the various option alternatives, you purchase the \$5.50 call for 15 cents, which provides protection above the current market price level.

Scenario #1: Prices Rise

If prices rise, and assuming the basis remains unchanged at 10 cents under, you will pay a maximum of \$5.55/bushel for wheat. That is, the option strike price (\$5.50) plus the premium paid for the option (\$.15) less the basis (\$.10 under).

Assume the December futures price has risen to \$6.50 and your supplier is offering cash wheat at \$6.40 (\$6.50 futures price - \$.10 basis).

With the futures price at \$6.50, the call option with a strike price of \$5.50 can be sold for at least its intrinsic value of \$1.00. Deducting the 15-cent premium paid for the option gives you a net gain of 85 cents/bushel. The cash market price of \$6.40 less the 85-cent gain gives you an effective buying price of \$5.55/bushel.

Scenario #2: Prices Decrease

If December wheat futures prices decrease below the \$5.50 strike price, your option will not have any intrinsic value but may have some remaining time value. To receive the remaining time value and lower the purchase price, you should attempt to offset the option. Your net wheat flour price will be directly related to the cash price for wheat plus the premium you initially paid for the option minus any time value you recover. If the option doesn't have any time value, you can allow the option to expire worthless.

For example, assume the December wheat futures price at the time you procure your cash wheat needs has decreased to \$3.00 and your supplier is offering a local price of \$2.90 (futures price less the basis of \$.10 under). You allow the option to expire since it has no intrinsic or time value. The net price you pay for wheat, equals \$3.05 (\$2.90 cash price + \$.15 option premium paid).

Whether the market price has gone up or down, the following formula allows you to calculate the net price for the basic ingredient (wheat in this scenario) you are buying:

Futures price when you purchase the ingredient

- +/- Local basis at the time of your purchase
- + Premium paid for the option
- Premium received when option offset (if any)
- = Net purchase price

Results

Note the different price scenarios for the November time period. Regardless of the price increase in cash wheat, the maximum purchase price is \$5.55/bushel because of the increasing profits in the long call option position. As prices decline, the wheat buyer continues to improve on the effective buying price.



| Option strike price | Call Option premium | Put Option premium |
|---------------------|---------------------|--------------------|
| \$5.10 | \$.41 | \$.01 |
| \$5.20 | \$.33 | \$.04 |
| \$5.30 | \$.27 | \$.08 |
| \$5.40 | \$.21 | \$.12 |
| \$5.50 | \$.15 | \$.16 |
| \$5.60 | \$.11 | \$.22 |
| \$5.70 | \$.07 | \$.28 |
| \$5.80 | \$.03 | \$.34 |
| \$5.90 | \$.01 | \$.41 |

Strategy #3: Selling Put Options

Lower your Buying Price in a Stable Market

If you anticipate the market remaining stable, you can lower the buying price of your ingredients by selling (going “short”) a put option. By selling a put option as a commodity buyer, you can lower the purchase price of your ingredients by the amount of premium received provided the market remains relatively stable.

If the futures market falls below the put’s strike price, you’ll be able to buy the cash commodity at a lower price than you originally expected (the cash and futures markets generally move parallel to each other), but you will lose on the short put. If the futures market falls below the strike price by more than the premium, your losses on the short put offset the lower price paid to your supplier. If the futures market rallies, the only protection you have against the higher cash price is the premium collected from selling the put. Also, because selling options involves market obligations, margin funds must be posted with your broker.

Action

Assume again you are a wheat buyer for a food manufacturer that that needs to establish a price for mid-November delivery. It is August, the December wheat futures price is \$5.50 per bushel, and you expect wheat prices to trade in a narrow range through the next several months. Also, assume out-of-the-money

December wheat puts (i.e., strike price of \$5.30) are trading at 8 cents a bushel. The expected basis is 10 cents under December. You decide to sell December \$5.30 puts to reduce the actual price you pay for cash wheat between now and November. (The December contract is used because it most closely follows the time you plan to take delivery of your ingredients.)

To calculate the expected floor purchase price simply use the following formula:

Minimum (floor) Buying Price =

Put strike price - premium received +/- expected basis
\$5.30 put strike - \$.08 premium - \$.10 basis = \$5.12

With this strategy, the effective purchase price will increase if the futures price rises above the put strike price. Once that happens, your protection is limited to the premium received and you will pay a higher price for wheat in the cash market.

Results

Your effective buying price will depend on the actual futures price and basis (10 cents under as expected) when you purchase your cash wheat. In this example, the table below lists the net wheat prices as a result of various futures price levels.

As the equation indicates, after adjusting for the basis, premium received from the sale of the puts reduces the effective purchase price of wheat. But there are risks when selling options. If prices fall below the put strike price, there is the possibility you will be exercised against and assigned a long futures position at any time during the life of the option position. This would result in a position loss equal to the difference between the strike price and the futures market price. This loss offsets the benefit of a falling cash market, effectively establishing a floor price level. In contrast, if the market price increases, your upside protection is limited only to the amount of premium collected.



| Long \$5.50 December wheat call at \$.15/bushel premium | | | | |
|---|-------|------------|------------------------------|------------------------|
| If Dec wheat futures are: | Basis | Cash Price | Long futures gain(-)/loss(+) | Effective buying price |
| \$5.00 | -.10 | \$4.90 | +.15 (L) | \$5.05 |
| \$5.25 | -.10 | \$5.15 | +.15 (L) | \$5.30 |
| \$5.50 | -.10 | \$5.40 | +.15 (L) | \$5.55 |
| \$5.75 | -.10 | \$5.65 | -.10 (G) | \$5.55 |
| \$6.00 | -.10 | \$5.90 | -.35 (G) | \$5.55 |

| Strike price | Call Option premium | Put Option premium |
|--------------|---------------------|--------------------|
| \$5.10 | \$.41 | \$.01 |
| \$5.20 | \$.33 | \$.04 |
| \$5.30 | \$.27 | \$.08 |
| \$5.40 | \$.21 | \$.12 |
| \$5.50 | \$.15 | \$.16 |
| \$5.60 | \$.11 | \$.22 |
| \$5.70 | \$.07 | \$.28 |
| \$5.80 | \$.03 | \$.34 |
| \$5.90 | \$.01 | \$.41 |

Strategy #4: Buy a Call and Sell a Put

Establish a Buying Price Range

This long hedging strategy provides you with a buying price range. Purchasing a call option creates a ceiling price and selling a put establishes a floor price. The strike prices of the options determines your price range. You would choose a lower strike price for the put option (i.e., a floor price) and a higher strike price for the call option (i.e., a ceiling price). As with all strategies, the range selected depends on your company's price objectives and risk exposure. The premium received from selling the put allows you to reduce the premium cost of the call. You effectively lower the ceiling price by selling the put.

Once more, assume you are buying wheat for your firm and decide to use wheat options to establish a price range for requirements between August and November. As described in Strategy #1, December wheat futures are at \$5.50 a bushel and the expected buying basis in November is generally 10 cents under December wheat futures. The premiums for the December wheat call and put options (the same as used in Strategies #2 and #3) are:

Action

You first need to calculate the "buying price range" that fits your risk tolerance level. This is done by using the following formulas.

Maximum (ceiling) Purchase Price = Call strike price + call premium paid - put premium received +/- expected basis

Minimum (floor) Purchase Price = Put strike price + call premium paid - put premium received +/- expected basis

Using these formulas and the various option premiums, you can calculate different buying ranges based upon the strike prices chosen. The greater the difference between the call and put strike prices, the wider the purchase price range. Conversely, a smaller difference in the strike prices will result in a narrower purchase price range.

After considering various options, you decide to establish a buying price range by purchasing a \$5.50 call for 15 cents and selling a \$5.30 put for 8 cents. The call option was initially at-the-money and the put option was initially out-of-the-money.

Results

Regardless of what the futures market does, your net buying price will be no more than \$5.47 (\$5.50 call strike + \$.15 call premium paid - \$.08 put premium received - \$.10 basis) and no

less than \$5.27 (\$5.30 put strike + \$.15 call premium paid - \$.08 put premium received - \$.10 basis), subject to any variation in the basis. The price range is 20 cents because this is the difference between the call and put strike prices. Looking at the net results based on different futures prices scenarios in the table below confirms the establishment of a buying price range.

| If futures price is: | Actual - Basis | Cash = Price | Long futures gain(-)/loss(+) | Buying = Price |
|----------------------|----------------|--------------|------------------------------|----------------|
| \$5.00 | -.10 | = \$2.90 | + \$.22 (L) | = \$5.12 |
| \$5.25 | -.10 | = \$5.15 | -.05 (G) | = \$5.12 |
| \$5.50 | -.10 | = \$5.40 | -.08 (G) | = \$5.32 |
| \$5.75 | -.10 | = \$5.65 | -.08 (G) | = \$5.57 |
| \$6.00 | -.10 | = \$5.90 | -.08 (G) | = \$5.82 |

Comparing Commodity Purchasing Strategies

A commodity buyer should realize that there isn't one "perfect" strategy for all firms or for all market conditions. Different economic conditions require different purchasing strategies. Therefore, an astute commodity buyer should become familiar with all of the available purchasing strategies. They should learn how to evaluate and compare the strategies, and sometimes realize that a strategy may need to be revised, even in the middle of a purchasing cycle, due to changing market conditions.

The purchasing strategies we looked at in this chapter are some of the more common ones, but by no means, are they to be considered a complete list of purchasing strategies. Each firm with their own risk/reward profiles will have to make a decision—which strategy is the best for their needs.

The following chart compares four purchasing strategies involving futures or options and one strategy without price risk management. Each of the strategies has strengths and weaknesses, which will be discussed in the following paragraphs.

Note: All of the following strategies being compared assume a basis of 10 cents under the December

wheat futures contract. If the basis turns out to be anything other than 10 cents under the December contract, the effective purchase price will be different. A stronger basis would increase the purchase price and a weaker than expected basis would lower the effective purchase price.

Long Futures

The long futures position is the most basic price risk management strategy for a commodity buyer. This strategy allows the commodity buyer to "lock in a price level" in advance of the actual purchase. It provides protection against the risk of rising prices but does not allow improvement in the purchase price should the market decline. This position requires the payment of a broker's commission as well as the costs associated with maintaining a margin account. In the following table, the long futures position fares the best when the market moves higher (i.e., when the price risk occurs).

Long Call Option

The long call option position provides protection against rising commodity prices but also allows the buyer to improve on the purchase price if the market declines. The long call position "establishes a maximum (ceiling) price level." The protection and opportunity of a long call option position comes at a cost—the call option buyer must pay the option premium at the time of the purchase. In the table, the long call option provides upside price protection similar to the long futures position except at a cost. Unlike the long futures position, the long call option nets a better purchase price when the market declines.

| Dec. futures price at offset | - Basis | Cash = price | -/+ | \$5.50 call gain (-) /loss (+) | -/+ | \$5.30 put gain (-) /loss (+) | Net = price |
|------------------------------|---------|--------------|-----|--------------------------------|-----|-------------------------------|-------------|
| \$5.00 | -.10 | = \$4.90 | + | \$.15 (L) | + | \$.22 (L) | = \$5.27 |
| \$5.25 | -.10 | = \$5.15 | + | \$.15 (L) | - | \$.03 (G) | = \$5.27 |
| \$5.50 | -.10 | = \$5.40 | + | \$.15 (L) | - | \$.08 (G) | = \$5.47 |
| \$5.75 | -.10 | = \$5.65 | - | \$.10 (G) | - | \$.08 (G) | = \$5.47 |
| \$6.00 | -.10 | = \$5.90 | - | \$.55 (G) | - | \$.08 (G) | = \$5.47 |

**Long call option gain/loss = futures price - call strike price - call premium paid; maximum loss = premium paid*

**Short put option gain/loss = futures price - put strike price + put premium received; maximum put profit = premium received*



Comparing Commodity Purchasing Strategies

A commodity buyer should realize that there isn't one "perfect" strategy for all firms or for all market conditions. Different economic conditions require different purchasing strategies. Therefore, an astute commodity buyer should become familiar with all of the available purchasing strategies. They should learn how to evaluate and compare the strategies, and sometimes realize that a strategy may need to be revised, even in the middle of a purchasing cycle, due to changing market conditions.

The purchasing strategies we looked at in this chapter are some of the more common ones, but by no means, are they to be considered a complete list of purchasing strategies. Each firm with their own risk/reward profiles will have to make a decision--which strategy is the best for their needs.

The following chart compares four purchasing strategies involving futures or options and one strategy without price risk management. Each of the strategies has strengths and weaknesses, which will be discussed in the following paragraphs.

Note: All of the following strategies being compared assume a basis of 10 cents under the December wheat futures contract. If the basis turns out to be anything other than 10 cents under the December contract, the effective purchase price will be different. A stronger basis would increase the purchase price and a weaker than expected basis would lower the effective purchase price.

Long Futures

The long futures position is the most basic price risk management strategy for a commodity buyer. This strategy allows the commodity buyer to "lock in a price level" in advance of the actual purchase. It provides protection against the risk of rising prices but does not allow improvement in the purchase price should the market decline. This position requires the payment of a broker's commission as well as the costs associated with maintaining a margin account. In the following table, the long futures position fares the best when the market moves higher (i.e., when the price risk occurs).

Long Call Option

The long call option position provides protection against rising commodity prices but also allows the buyer to improve on the purchase price if the market declines. The long call position "establishes a maximum (ceiling) price level." The protection and opportunity of a long call option position comes at a cost--the call option buyer must pay the option premium at the time of the purchase. In the table, the long call option provides upside price protection similar to the long futures position except at a cost. Unlike the long futures position, the long call option nets a better purchase price when the market declines.

| If Dec wheat futures offset | Long Futures | Long Call | Short Put | Long call/ Short put | Do nothing |
|-----------------------------|--------------|-----------|-----------|----------------------|------------|
| \$5.00 | \$5.40 | \$5.05 | \$5.12 | \$5.27 | \$4.90 |
| \$5.25 | \$5.40 | \$5.30 | \$5.12 | \$5.27 | \$5.15 |
| \$5.50 | \$5.40 | \$5.55 | \$5.32 | \$5.47 | \$5.40 |
| \$5.75 | \$5.40 | \$5.55 | \$5.57 | \$5.47 | \$5.65 |
| \$6.00 | \$5.40 | \$5.55 | \$5.82 | \$5.47 | \$5.90 |

Short Put Option

The long call option position provides protection against rising commodity prices but also allows the buyer to improve on the purchase price if the market declines. The long call position "establishes a maximum (ceiling) price level." The protection and opportunity of a long call option position comes at a cost--the call option buyer must pay the option premium at the time of the purchase. In the table, the long call option provides upside price protection similar to the long futures position except at a cost. Unlike the long futures position, the long call option nets a better purchase price when the market declines.

Although the short put option position is the riskiest of the strategies that we covered in this publication, it provides the best purchase price in a stable market, as seen in the table. However, if the market declines, the put option "establishes a minimum (floor) purchase price level." The worst case scenario



for this strategy is if the market rallies because the upside protection is limited to the premium collected for selling the put.

Long Call Option and Short Put Option

By combining the short put position with the long call position, the commodity buyer establishes a lower ceiling price level because of the premium received for selling the put. However, the cost of this benefit is that the short put position limits the opportunity of lower prices by establishing a floor price level. Effectively, the commodity buyer “established a purchase price range” with this strategy. The price range is determined by the strike prices and therefore can be adjusted (widened or narrowed) by choosing alternative strike prices. After the long futures position, this strategy provided the most protection against rising prices, as noted in the table.

Do Nothing

Doing nothing to manage purchasing price risk is the most simplistic strategy for a commodity buyer—but also the most dangerous should the market rally. Doing nothing will yield the

best purchase price as the market declines but “provides zero risk management” against a rising market, as indicated in the table.

Other Purchasing Strategies

There are many other purchasing strategies available to a commodity buyer. These strategies may involve futures, options or cash market positions and each will have their own set of advantages and disadvantages. As stated earlier in this chapter, a good commodity buyer should acquaint themselves with all of their alternatives and understand when a specific strategy should be employed or revised. Remember, a strategy that worked effectively for one commodity purchase may not be the best for your next commodity purchase.

Chapter Five

Option Hedging Strategies for Selling Commodities

The Seller of Commodities

Commodity sellers, similar to commodity buyers, are potential hedgers because of their need to manage price risk. Commodity sellers are individuals or firms responsible for the eventual sale of the physical raw commodities (e.g., wheat, rice, corn) or derivatives of the raw commodities (e.g., soybean meal, flour). For example, commodity sellers can be farmers, grain

elevator, grain cooperatives, or exporters. Although they have different functions in the agricultural industry, they share a common risk—falling prices and a common need to manage that price risk. The following strategies for commodity sellers provide different risk management benefits.

Strategy #1: Selling Futures

Protection against Falling Prices

As a soybean producer, who just completed planting, you are concerned that prices will decline between spring and harvest. With November soybean futures currently trading at \$8.50/bushel and your expected harvest basis of \$.25 under November soybean futures, the market is at a profitable price level for your farm operation. To lock in this price level, you take a short position in November soybean futures. Although you are protected should the prices move lower than \$8.50, this strategy will not allow you to improve your selling price if the market moves higher.

A short futures position will increase in value to offset a lower cash selling price as the market declines and it will decrease in value to offset a higher cash selling price as the market rallies. Basically, a short future position locks in the same price level regardless of which direction the market moves.

The only factor that will alter the eventual selling price is a change in the basis. If the basis turns out to be stronger than the expected 25 cents under, then the effective selling price will be higher. For example, if the basis turns out to be 18 cents under November at the time you sell your soybeans, the effective selling price will be 7 cents better than expected. If the basis weakens to 31 cents under at the time of the cash soybean sale, then the effective selling price will be 6 cents lower than expected.

Action

In the spring, you sell November soybean futures at \$8.50/bushel.

Expected Selling Price =

Futures price +/- expected basis = $\$8.50 - .25 = \8.25 //bushel

Results

Assuming the November soybean futures drops below \$8.50 at harvest and the basis is 25 cents under, as expected, the lower price you receive for your cash soybeans would be offset by a

gain in your short futures position. If November soybeans futures rallies above \$8.50 and the basis is 25 cents under, the higher selling price you receive for the soybeans will be offset by a loss on the short futures position.

| Short November Soybean Futures at \$8.50/bu | | | | |
|---|---------|--------------|-----|---------------------------------------|
| Dec. futures price at offset | - Basis | Cash = price | -/+ | short futures gain(-)/loss(+) = price |
| \$7.50 | -.25 | = \$7.25 | + | \$1.00 (G) = \$8.25 |
| \$8.00 | -.25 | = \$7.75 | + | \$.50 (G) = \$8.25 |
| \$8.50 | -.25 | = \$8.25 | 0 | = \$8.25 |
| \$9.00 | -.25 | = \$9.25 | - | \$.50 (L) = \$8.25 |
| \$7.50 | -.25 | = \$9.25 | - | \$1.00 (L) = \$8.25 |

Note the different price scenarios for the harvest time period (October) in the table above. Regardless of the November soybean futures moving higher or lower, the effective cash selling price will be \$8.25/bushel if the basis is 25 cents under. Any change in the basis will alter the effective selling price.

If the basis was stronger (20 cents under) when futures were at \$7.50, the effective selling price would have been \$8.30. If the basis weakened (30 cents under) when futures were at \$9.50, the effective selling price would have been \$8.20.

Strategy #2: Buying Put Options

Protection against Lower Prices and Opportunity if Prices Rally

As a soybean producer whose crop has just been planted, you are concerned that there may be a sharp decline in prices by harvest in October. You would like to have protection against lower prices without giving up the opportunity to profit if prices increase. At the present time, the November futures price is quoted at \$8.50 per bushel. The basis in your area during October is normally 25 cents under the November soybean futures price. Thus, if the November futures price in October is \$8.50, local buyers are likely to be bidding about \$8.25.



Premiums for November soybean put and call options with various strike prices are presently quoted as follows:

| Put option strike price | Put Option premium | Call option premium |
|-------------------------|--------------------|---------------------|
| \$8.00 | \$.10 | \$.61 |
| \$8.20 | \$.19 | \$.51 |
| \$8.50 | \$.30 | \$.31 |
| \$8.80 | \$.49 | \$.21 |
| \$9.00 | \$.60 | \$.12 |

Expected Selling Price

To evaluate the expected minimum (floor) selling price and compare the price risk exposure from the various put options, use the following formula:

Minimum (floor) Selling Price =

Put strike - premium paid +/- expected basis

Comparing two of the put options from the previous chart:

$\$8.80$ (strike) - $\$.49$ (premium paid) - $\$.25$ (expected basis)
= $\$8.06$ floor price

$\$8.50$ (strike) - $\$.30$ (premium paid) - $\$.25$ (expected basis)
= $\$7.95$ floor price

As you can see, the greater protection comes from the put option with the higher strike prices and therefore, the greatest premium.

Action

You decide to use options to manage your price risk. After considering the various options available, you buy the $\$8.50$ put (at-the-money) at a premium of 30 cents a bushel.

Scenario #1: Prices Decline

If prices decline and assuming the basis remains unchanged at 25 cents under, you will receive a minimum $\$7.95$ per bushel for your crop. That is the option strike price ($\$8.50$) minus the expected basis ($\$.25$ under) less the premium paid for the option ($\$.30$).

Assume the November futures price has declined to $\$7.50$, and local buyers are paying $\$7.25$ (futures price - the basis of $\$.25$ under).

With the futures price at $\$7.50$, the $\$8.50$ put option can be sold for at least its intrinsic value of $\$1.00$. Deducting the 30 cents you paid for the option gives you a net gain of 70 cents. That, added to the total cash market price of $\$7.25$, gives you a total net return of $\$7.95$ per bushel.

Scenario #2: Prices Increase

If prices increase, you will allow your put option to expire if there isn't any time value, because the right to sell at $\$8.50$ when futures prices are in excess of $\$8.50$ doesn't have any intrinsic value. Your net return will be whatever amount local buyers are paying for the crop less the premium you initially paid for the option.

Assume the futures price when you sell your crop has increased to $\$10.00$, and local buyers are paying $\$9.75$ (futures price - the basis of $\$.25$ under).

You would either allow the option to expire if there isn't any time value or offset the put option if there is time value remaining. If you allow the put option to expire, your net return will be $\$9.45$ (local cash market price of $\$9.75$ - the $\$.30$ premium paid).

Regardless of whether prices have decreased or increased, there is an easy way to calculate your net return when you sell your crop:

Futures price when you sell your crop
+/- Local basis at the time you sell
+ Premium paid for the option
- Option value when option offset (if any)
= Net selling price

Results

Note the different price scenarios for the October time period. Regardless of the price decline in soybeans, the minimum selling price is $\$7.95$ /bushel because of the increasing profits in

the long put option position. As prices rally, the soybean seller continues to improve on the effective selling price. In other words, the soybean seller has protection and opportunity.

| Long \$8.50 November soybean put at \$.30/bu premium | | | | | |
|--|---------|--------------|-----|--------------------------|------------------------|
| If Nov. soybean futures are at: | - Basis | = Cash price | +/- | long put gain(-)/loss(+) | = Actual selling price |
| \$7.50 | -.25 | = \$7.25 | + | \$.70 (G) | = \$7.95 |
| \$8.00 | -.25 | = \$7.75 | + | \$.20 (G) | = \$7.95 |
| \$8.50 | -.25 | = \$8.25 | - | \$.30 (L) | = \$7.95 |
| \$9.00 | -.25 | = \$8.75 | - | \$.30 (L) | = \$8.45 |
| \$9.50 | -.25 | = \$9.25 | - | \$.30 (L) | = \$8.95 |

Strategy #3: Selling Call Options

Increase Your Selling Price in a Stable Market

If you are expecting a relatively stable market, you can increase your selling price by selling (going short) a call option. As a commodity seller, you will increase the effective selling price by the amount of premium collected when you sell call options.

If the futures market price increases above the call strike price, you will be able to sell the cash commodity at a better price but you will begin to lose on the short call option position.

If the market rallies above the call strike price by an amount greater than the premium collected, the losses on the short call will outweigh the increased cash selling price. As a result, this strategy locks in a maximum (ceiling) selling price level.

If the futures market declines below the strike price, the only protection you have against falling prices is the premium collected from selling the call option. Note, that by selling options, you have a market obligation and therefore you will be required to maintain a margin account. Additionally, as an option seller, you may be exercised on at any time during the life of

the option. As with all risk management strategies, the effective selling price will be affected by any change in the expected basis.

Action

Assume you are a soybean producer who is planning to deliver soybeans in October at harvest and expect the harvest basis to be 25 cents under the November soybean futures. November soybean futures are currently trading at \$8.50/bushel and you don't expect very much price movement in the months leading up to harvest. To enhance your effective selling price, you decide to sell the 8.80 November soybean call option (out-of-the-money) for a premium of 21 cents per bushel.

Use the following formula to evaluate this strategy.

This formula should also be used to compare this type of strategy using different strike prices:

Expected Maximum (ceiling) Selling Price

| | |
|--------------------------|--------|
| Call Option Strike Price | \$8.80 |
| + Premium Received | \$.21 |
| +/- Expected Basis | -.25 |

\$8.76

With this strategy, the effective selling price will decrease if the futures price falls below the call strike price. Once that happens, your price protection is limited to the premium collected and you will receive a lower selling price in the cash market.

Results

Your effective selling price will depend on the futures price and the actual basis when you sell your cash commodity. In this example, the following table lists the effective selling prices for a variety of futures price scenarios.

As the formula indicates, after adjusting for the actual basis, the premium received from the sale of the call increases the effective selling price. But note that there are risks associated with selling options. If prices rally above the call strike price, there is the possibility that you will be exercised on and assigned a short futures position at any time during the life of the call option. As

the market rallies, the losses sustained on the short call position will offset the benefits of a higher cash price, thereby establishing a ceiling selling price (\$8.46). In contrast, if the market prices decline, your downside price protection is limited to the amount of premium collected.

Strategy #4 Buy a Put and Sell a Call

Establish a Selling Price Range

This is a short hedging strategy with the net effect of creating both a floor price and a ceiling price. Let's assume you are a soybean farmer and you have just planted your crop. The November soybean futures contract is trading at \$8.50 per bushel, and you anticipate the local basis to be 25 cents under by harvest. You like the idea of having downside price protection but if there is a market rally between now and fall, you won't be able to take advantage of it if you're short futures. Instead, you decide to buy a put option. You have downside protection but are not locked in if prices rise. The only catch is the option premiums are a little higher than what you'd like to spend. What you can do to offset some of the option cost is establish a "fence" or "combination" strategy. With this type of strategy, you buy a put and offset some of the premium cost by selling an out-of-the-money call option.

| Short \$8.80 Call Option for 21 cents Premium: Scenarios If Nov. soybean futures are at: | | | | | |
|--|---------|--------------|-----|----------------------------|---------------------|
| | - Basis | = Cash price | +/- | short call gain(-)/loss(+) | = Net selling price |
| \$7.50 | -\$0.25 | = \$7.25 | + | \$0.21 (G) | = \$7.46 |
| \$8.00 | -\$0.25 | = \$7.75 | + | \$0.21 (G) | = \$7.96 |
| \$8.50 | -\$0.25 | = \$8.25 | + | \$0.21 (G) | = \$8.46 |
| \$9.00 | -\$0.25 | = \$8.75 | + | \$0.01 (G) | = \$8.76 |
| \$9.50 | -\$0.25 | = \$9.25 | - | \$0.49 (L) | = \$8.76 |

However, this strategy establishes a selling price range where you can't benefit from a price rally beyond the call

strike price. The premiums for the November soybean put options and the November soybean call options are:

| Strike price | Put Option premium | Call option premium |
|--------------|--------------------|---------------------|
| \$8.00 | \$.10 | \$.61 |
| \$8.20 | \$.19 | \$.51 |
| \$8.50 | \$.30 | \$.31 |
| \$8.80 | \$.49 | \$.21 |
| \$9.00 | \$.60 | \$.12 |

Action

The first step would be to calculate "the selling price range" under various option scenarios. This is easily done by using the following formulas:

Floor price level =

Put strike price - put premium + call premium +/- expected basis

Ceiling price level =

call strike price - put premium + call premium +/- expected basis

After considering various alternatives, you decide to buy an at-the-money \$8.50 put for 30 cents and sell an out-of-the-money \$8.80 call for 21 cents. The strategy can be put on for a net debit of 9 cents per bushel, and the selling price range is well within your projected production costs plus profit margin.

Results

As shown in the table below, your net selling price will vary depending on what the November soybean futures price is when you offset your combination put/call (fence) strategy. What is interesting is with the long put/short call strategy the net selling price will be anywhere from \$8.16 to \$8.46 provided the basis is 25 cents under.



Long \$8.50 Put and Short \$8.80 Call: Scenarios

| Futures price at harvest | Actual - Basis | Cash = price | | \$8.50 put gain (-) /loss (+) | \$8.80 call gain (-) /loss (+) | Net Selling = price | |
|--------------------------|----------------|--------------|---|-------------------------------|--------------------------------|---------------------|----------|
| \$7.50 | -\$0.25 | = \$7.25 | + | \$0.70 (G) | + | \$0.21 (G) | = \$8.16 |
| \$8.00 | -\$0.25 | = \$7.75 | + | \$0.20 (G) | + | \$0.21 (G) | = \$8.16 |
| \$8.50 | -\$0.25 | = \$8.25 | - | \$0.30 (L) | + | \$0.21 (G) | = \$8.16 |
| \$9.00 | -\$0.25 | = \$8.75 | - | \$0.30 (L) | + | \$0.01 (G) | = \$8.46 |
| \$9.50 | -\$0.25 | = \$9.25 | - | \$0.30 (L) | - | \$0.49 (L) | = \$8.46 |

* Long put option gain/loss = put strike price - futures price - put premiums; maximum cost (loss) = premium paid

** Short call option gain/loss = call strike price - futures price + call premiums; maximum gain = premium received

allows the commodity seller to “lock in a price level” in advance of the actual sale. It provides protection against the risk of falling prices but does not allow improvement in the selling price should the market rally. This position requires the payment of a broker’s commission, as well as the costs associated with maintaining a margin account. In the comparison chart, the short futures position fares the best when the risk occurs as the market moves lower.

Long Put Option

The long put option position provides protection against falling commodity prices but also allows the seller to improve on the selling price if the market rallies. The long put position “establishes a minimum (floor) selling price level.” The protection and opportunity of a long put option position comes at a cost—the put option buyer must pay the option premium. In the comparison chart, the long put option provides upside price protection similar to the short futures position with the difference being the cost of the protection—the premium. Unlike the short futures position, the long put option nets a better selling price when the market rallies. When buying a put option, you must pay a brokerage commission but you do not have a margin account to maintain.

Comparing Commodity Selling Strategies

A commodity seller doesn’t have one “perfect” strategy that will fit all market conditions. You need to realize that different economic conditions require different selling strategies. Therefore, a smart seller of commodities should become familiar with all of the available selling strategies. They should learn how to evaluate and compare the strategies, and sometimes realize that a strategy may need to be revised due to changing market conditions.

The commodity selling strategies we looked at in this chapter are fairly common ones, but by no means, are they to be considered an all-inclusive list of selling strategies. Each individual or firm with their own risk/reward profiles will have to make the ultimate decision—what strategy is the best for their risk management needs.

The following chart compares four commodity selling strategies involving futures or options and one strategy not involving price risk management. Each of the strategies has their own strengths and weaknesses, which will be discussed in the following paragraphs.

Short Futures

The short futures position is the most basic price risk management strategy for a commodity seller. This strategy

| If Nov soybean futures are at: | Short Futures | Long Put | Short Call | Long put/Short call | Do nothing |
|--------------------------------|---------------|----------|------------|---------------------|------------|
| \$7.50 | \$8.25 | \$7.95 | \$7.46 | \$8.16 | \$7.25 |
| \$8.00 | \$8.25 | \$7.95 | \$7.96 | \$8.16 | \$7.75 |
| \$8.50 | \$8.25 | \$7.95 | \$8.46 | \$8.16 | \$8.25 |
| \$9.00 | \$8.25 | \$8.45 | \$8.76 | \$8.46 | \$8.75 |
| \$9.50 | \$8.25 | \$8.95 | \$8.76 | \$8.46 | \$9.25 |

Note: All of the strategies being compared assume a basis of 25 cents under the November futures contract. If the basis turns out to be anything other than 25 cents under the November futures contract, the effective selling price will be different. A stronger basis would increase the selling price and a weaker than expected basis would lower the effective selling price.



Short Call Option

Although the short put option position is the riskiest of the selling strategies covered in this section, it provides the best selling price in a stable market, as seen in the comparison chart. However, if the futures market price increases, the put option “establishes a maximum (ceiling) selling price level.”

The worst case scenario for this strategy is if the market declines significantly because the downside protection is limited to the premium collected for selling the call.

Long Put Option and Short Call Option

By combining the short call position with the long put position, the commodity seller establishes a higher floor price level because of the premium received for selling the call. However, the cost of this benefit is that the short call position limits the opportunity of higher prices by establishing a ceiling price level. Effectively, the commodity seller using this strategy “establishes a selling price range.” The selling price range is determined by the strike prices and therefore can be adjusted (widened or narrowed) by choosing alternative strike prices. Next to the short futures position, this strategy provides the most protection against falling prices, as noted in the comparison chart.

Do Nothing

Doing nothing to manage price risk is the most simplistic strategy for a commodity seller—but also the most dangerous should the market decline. Doing nothing will yield the best selling price as the market rallies but “provides zero price risk management” against a falling market, as indicated in the comparison chart.

Other Strategies for Selling Commodities

There are many other strategies available to a commodity seller. These strategies may involve futures, options or cash market positions and each will have their own set of advantages and disadvantages. As stated earlier in this chapter, a commodity seller should be acquainted with all of their alternatives and understand when a specific strategy should be employed or revised. Remember, a strategy that worked effectively for one commodity sale may not be the best for your next commodity sale.

The first four strategies discussed are usually used in advance of the actual sale of commodities. The next strategy (#5) can be used after the sale of the commodity.

Strategy #5: Sell Cash Crop and Buy Calls

Benefit from a Price Increase

Another strategy that can be used by a commodity seller is to buy a call option after you sell the cash commodity. This strategy would enhance your effective selling price if the market rallies after the cash market sale has been completed.

If you're like most farmers, you've probably asked yourself on more than one occasion this question:

“Should I sell my crop now or store and hope prices go up by spring?”

If you sell at harvest you receive immediate cash for your crop—money that can be used to pay off loans or reduce interest expenses. It also eliminates the physical risk of storing crops, and ensures you won't get into a situation where an increase in price still doesn't cover storage expenses. Therefore, one of the primary comparisons to consider when deciding to store grain or purchase a call option is the cost of storage versus the cost (premium paid) of the call.

But, on the other side, it is always hard to sit back and watch prices rise during the winter months and not be able to take advantage of them.

Rather than make the choice, some farmers will sell their crops at harvest then turn around and purchase call options. That way, they have immediate cash at harvest but can still take advantage of a possible market rally.

Let's assume you are a corn producer. It is now October and the March futures price is quoted at \$4.30 a bushel. At the time, the March \$4.30 corn call option is trading at 10 cents per bushel.



Action

You sell your corn at harvest. After reviewing the premiums for the various call options, you decide to buy one at-the-money March call option for every 5,000 bushels of corn you sell at the elevator.

Results

If prices decline, your maximum cost, no matter how steep the futures price decline, will be 10 cents per bushel—the premium paid for the call.

If the March futures price increases any time before expiration, you can sell back the call for its current premium, and your net profit is the difference between the premium you paid for buying the March call and the premium received for selling (offsetting) the March call. Depending upon the March futures price, the table below shows your profit or loss if you had bought a March \$4.30 call at a premium of 10 cents. Assume there is no remaining time value left in the option.

| If March corn futures price in February is: | Long call net gain or loss |
|---|----------------------------|
| \$4.00 | \$.10 loss |
| \$4.10 | \$.10 loss |
| \$4.20 | \$.10 loss |
| \$4.30 | \$.10 loss |
| \$4.40 | \$0 |
| \$4.50 | \$.10 gain |
| \$4.60 | \$.20 gain |
| \$4.70 | \$.30 gain |

One of the greatest benefits of this strategy is the flexibility it provides to producers. They don't have to feel locked in to a given harvest price or take on additional storage costs with no guarantee that prices are going up and their grain won't suffer some physical damage. Of course, there is a price for this flexibility—the option premium. And option premiums will vary, depending on what option strike price you buy. Your options are open.

Flexibility and Diversity

The strategies described up to now have hopefully served two purposes: to illustrate the diversity of ways in which agricultural options can be used and to increase your “comfort level” with the arithmetic of options. By no means, however, have we included—or attempted to include—all of the possible strategies.

Neither have we fully discussed the “ongoing flexibility” enjoyed by buyers and sellers of options. The existence of a continuous market means that options initially bought can be quickly sold, and options initially sold can be quickly liquidated by an offsetting purchase. This provides the opportunity to rapidly respond to changing circumstances or objectives.

For example, let's say you paid 1.4 cents per pound for an at-the-money soybean oil put option with a strike price of 33 cents and, after several months, the underlying futures price declines to 28 cents. The put is now trading for 6 cents. By selling back the option at this price, you can ensure yourself a net return on the option of 4.6 cents. (\$.06 premium received – \$.014 premium paid). This could be an attractive strategy if, at 28 cents, you feel the price decline has run its course and prices are likely to rise. Once the futures price rises above 33 cents the put no longer holds any intrinsic value.

Options in Combination with Other Positions

As you fine-tune your understanding of options, you may well discover potentially worthwhile ways to use puts and calls in combination with hedging or forward contracting, either simultaneously or at different times.

For instance, assume a local elevator offers what you consider an especially attractive price for delivery of your crop at harvest. You sign the forward contract, but you're a little uneasy about the delivery clause. If you are unable to make complete delivery of the agreed upon amount, the elevator charges a penalty for the undelivered bushels. To protect yourself, you buy enough call options to cover your delivery requirements. Then, if you are unable to make complete delivery on the forward contract due to reduced yields and if the calls increased in value, you could offset some or all of your penalty charges.



For example, suppose a producer has entered into a forward contract to deliver 10,000 bushels of corn at \$4.20 in November. December futures are currently trading at \$4.40. He simultaneously buys two December \$4.60 corn calls (out of the money) at 10 cents per bushel. A floor price for the crop has been established at \$4.10 (\$4.20 forward contract – \$.10 premium paid).

Suppose it was a long, dry, hot summer, and production fell short of expectations. If these fundamentals caused futures prices to go beyond \$4.70, (i.e., the strike price plus the \$.10 paid for the option), the farmer could sell back the calls at a profit. The producer could then use this money to offset some of the penalty charges he might incur if he doesn't meet the delivery requirements of the forward contract.

Speculative Strategies

Other participants in the marketplace—traders and speculators—help to provide a liquid market that enables options to be quickly bought and sold. They hope to profit by correctly anticipating the direction and timing of price changes.

For example, let's say a trader anticipates rising wheat prices and buys a futures contract at \$5.20 per bushel. The futures price subsequently climbs to \$5.50, giving the trader a "paper profit" of 30 cents per bushel. On the one hand, the trader does not want to give up the opportunity to realize an even larger profit if the price continues to move sharply higher but, on the other hand, is reluctant to risk losing the paper profit already achieved if the price should turn downward. The solution could be to leave the long futures position intact (to profit from further increases) and buy a \$5.50 put (for insurance against a price decline).

If the cost of the \$5.50 put is 8 cents per bushel, buying the put has the effect of "locking in" 22 cents of the 30-cent unrealized gain. Should prices continue upward to \$5.80, for example, the net profit is 52 cents (\$.60 futures gain—\$.08 premium paid).

Conversely, suppose the trader sold the futures contract when the futures price was \$5.30 and the futures price subsequently declined to \$4.80. One alternative, of course, is to liquidate the

futures position and pocket the 50-cent profit. A better alternative might be to leave the futures position intact and buy a call with a \$4.80 strike price. If the trader pays 10 cents for the call, this locks in 40 cents of the unrealized profit in the short futures position.

Ways to Speculate on Volatile Prices or on Stable Prices

Just as it is possible to speculate on rising prices with a known and limited risk by buying calls (the most one can lose is the option premium), or to speculate on declining prices by buying puts, experienced option traders can use strategies that offer an opportunity for profit if the underlying futures price changes substantially in either direction. Briefly, here is how they work:

If one expects prices during the months ahead to be highly volatile but is uncertain about the most probable direction of the price change, a trader might consider purchasing both a put and a call with the same strike price and expiration month. This strategy is called buying a straddle. The trader will realize a net profit at expiration if the futures price is either above or below the strike price by an amount greater than the total of the premiums paid for the two options. The maximum risk is the cost of the options.

Example: Expecting volatile corn prices over the next three months, one simultaneously buys a \$3.00 put at a premium of 15 cents per bushel and a \$5.00 call at a premium of 15 cents per bushel—total premium cost: 30 cents. If the futures price at expiration is below \$4.70 or above \$5.30, the position realizes a net profit. At any price within this range—other than exactly \$5.00—a portion (but not all) of the 30-cent premium cost will be recovered by offsetting the in-the-money option and allowing the out-of-the-money option to expire worthless.

Another strategy—known as selling a straddle—offers a way to profit from relatively stable prices. It involves selling (writing) both a put and a call with the same strike price and expiration month. There are two break-even points associated with this strategy. The lower break-even point equals the common strike price less the net credit. The upper break-even point equals the common strike price plus the net credit. The maximum profit potential equals the net credit



received. (It should be pointed out, however, that this strategy involves a number of risks and should be considered only by those traders who thoroughly understand these risks.)

Example: Assume one earns a 15-cent premium by writing a \$5.20 call and an additional 15-cent premium by writing a \$5.20 put for a total of 30 cents. If the futures price at expiration is between \$4.90 and \$5.50, the position will realize a net profit.

For instance, if the futures price at expiration is \$5.10, the call buyer will allow the option to expire worthless and the writer will retain the 15-cent premium. However, the put writer will net a 5-cent gain as the put buyer offsets the option to recapture 10 cents of intrinsic value plus any remaining time value. (\$.15 gain on call + \$.05 gain on put = \$.20 net profit.)

Transaction Costs

Trading futures and options involves various transaction costs, such as brokerage commissions and possible interest charges related to margin money. The strategies in this book do not include transaction fees. However, in reality, these costs should be included when evaluating futures and options strategies as they will effectively lower the commodity selling price or increase the commodity buying price. Check with your commodity broker for more information on commodity transaction costs.

Tax Treatment

With all futures and options strategies, you may want to check with your tax accountant regarding reporting requirements. The tax treatment may vary depending on the type of strategy implemented, the amount of time you hold the position, and whether the position is considered a hedge or speculative strategy.

In Conclusion

If you feel you have a working understanding of the material covered in this course—or even a major portion of it—consider yourself far better informed than all but a small percentage of your competitors. And, with the ever-increasing emphasis on marketing skills, it is an advantage that can open the door to new profit opportunities. This does not mean,

however, that you should rush immediately to the phone to begin placing orders to buy or sell futures or options.

Review and, from time to time, review again—the portions of this course having to do with market nomenclature and mechanics. Eventually, it will become second nature to you to calculate the possible outcomes of any given strategy and to compare that strategy with alternative marketing/pricing strategies.

Establish a relationship with a broker who is knowledgeable about agricultural futures, options, and price risk management. A broker can answer questions you will inevitably have, keep you posted on new developments, and alert you to specific opportunities that may be worth your consideration.

Seek additional information. Whenever available, send for copies of booklets and other publications on options from such sources as futures exchanges, brokerage firms, and extension-marketing specialists. Watch for opportunities to attend worthwhile seminars on futures and options.

Granted, honing your options skills will require an investment of time and effort, but there is a good chance it may be one of the best investments you will ever make.



Additional Resources

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Futures trading involves the substantial risk of loss and is not suitable for all investors.

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