Producer Series

1

Introduction to Hedging with Futures and Options

Gives a complete description of the advantages of using futures and options. Producer work sheets and a glossary of most commonly used futures and options terms are included.

2

Strategies for Selling Crops with Options

Provides advanced selling strategies for producers using the options markets. Prerequisite: A basic understanding of hedging with futures and options.

Taking Control of Your Future

Farming the land is a lifestyle as much as a job, a tradition passed on from generation to generation. There are things about farming you can control, like what crops you grow, whether or not you raise livestock, or when you buy inputs or sell whatever it is you're producing. But there are many things you cannot control, things like mother nature, world events, or supply and demand for crops or livestock.

The events and situations you may not have an influence over can have a devastating effect on your operation. The key is to learn how to manage the effect of these forces on your bottom line. By learning more about the use of futures and options in your marketing plan, you can manage these effects and take control of your future.

Price Risk

Because changes in the weather, economy, and other factors constantly affect the supply and demand for grain, the price of grain is always changing. Many producers don't recognize this price movement as a risk. Price risks are not as apparent as the risk of damaged equipment or loss of property.

Grain producers have to be aware of potentially low prices for their crops during the planting, growing, and harvesting periods. If a producer has a certain amount of money invested in seed, fertilizer, equipment, and labor, he runs the risk of a selling price that is too low to cover those costs and make a profit. The good news is that price risks such as these can be successfully managed by the producer.

Managing Price Risk

Pricing opportunities, times to take advantage of profitable crop prices, can occur several times during a year. By knowing what your operation needs to make a profit, you can take advantage of potential market opportunities when they occur, thereby reducing the risk of producing and selling grain at a loss. Producers can use the futures market to "lock in" a sales price before a crop is planted, during the growing season, or even once the grain is stored.

Here's an example of a producer who wants to "lock in" a price of $2.45 per bushel for his corn. His concern is that prices will fall between now and harvest or when he must deliver his crop, so he locks in the price level by selling a futures contract at the current price of $2.70 per bushel.

Local Cash Price	Futures Market Price
July 1 Wants to lock in corn price @ $2.45	Sells corn futures contract @ $2.70
Harvest/Delivery Sells corn @ $2.10	Buys corn futures @ $2.35 to offset initial short futures position
	Futures gain $.35 (sold futures @ $2.70 - bought futures @ $2.35)
Net Result Cash sale price ....$2.10 Futures gain ....+$ .35 Net selling price $2.45	

This example shows that even though corn prices fell between July 1 and harvest, the producer was still able to meet his price level goal through initially selling and later buying back futures contracts. Successful producers recognize and seize pricing opportunities throughout the year based on their individual needs.

There are several cash and futures marketing alternatives available to producers. One such alternative is a cash forward contract, where a producer contracts with an elevator to sell a crop before it is harvested. The elevator offers a fixed price for the farmer's crop even before it is harvested. The elevator, in turn, hedges that price in the futures market for protection against a possible price decline.

Producers can also hedge their crops in the futures market. Sometimes this results in better prices and more flexibility than forward contracting, but it requires an understanding of the markets and hedging strategies.

This booklet is an introduction to basic marketing alternatives available to grain producers through the use of futures and options. Livestock producers who buy feed ingredients can also benefit from futures and options markets. If you're a livestock producer, you should refer to the Chicago Board of Trade's booklet *Feed Cost Management for Livestock Producers* to learn more about using futures and options to control rising feed input costs.

When to Hedge

Before a producer can hedge, he must know what target price he needs to cover his cost of production and make a reasonable profit. This step is crucial to a successful marketing plan.

There are several ways to determine what your target price should be. One is to simply look at past production figures and factor in inflation. Another is to use state and local projections available from state extension services and farm advisory services.

By using cost of production figures plus a reasonable profit margin, a producer can establish his target price range. This target range should be looked at as a goal that may or may not be reached during the marketing year. Everyone would like to sell at the year's high, but a prudent producer establishes realistic goals.

For help in determining what your target price range might be, fill out the following Producer Work Sheet.

PRODUCER WORK SHEET: SECTION 1

Establishing a Target Price Range

What was my cost per acre last year? _____(A)

Is there anything that made last year different from a "normal" year? For example, higher than normal pesticide costs because of an especially bad insect infestation or lower irrigation costs because of unusually timely rain. If so, factor these costs in here. +/- _____(B)

What is the current rate of inflation? _____% (C)

Expected increase in cost of production due to inflation

= (A +/- B) x C _____(D)

Expected production cost per acre = (A +/- B) + D _____(E)

What can I expect to yield per acre this year? _____bu/acre (F)

Expected cost of production per bushel = E/F _____(G)

Add a reasonable profit margin on to your expected cost of production to establish a price goal. _____(H)

The range between your break-even point (line G) and your price goal (line H) can be looked at as your target price range. When prices move into this range, you should consider marketing alternatives.

(If you need more help in determining your cost of production, consult your local Farm Bureau or nearest land grant university.)

How Should I Market My Crop?

When futures prices are in your target range, you should explore marketing alternatives. Local elevators offer several types of cash marketing alternatives. Some of these are:

• Hedge to arrive contracts
• Forward contracts
• Minimum price contracts

Based on the price the elevator is offering, market expectations, and other factors, a producer may choose to use one or all of these cash marketing alternatives. Producers can also control the marketing of their crops by utilizing Chicago Board of Trade futures and options strategies through their local futures broker.

There are two basic types of futures market alternatives for producers selling crops. One is a simple futures hedge, which allows producers to "lock in" a price level for the future sale of a commodity.

The second is a simple options hedge, which allows grain producers to establish a minimum selling or "floor" price.

Which marketing alternative is right for you depends on your goals, market conditions, and comfort level.

For now, let's look at how and why farmers use the tools available from the Chicago Board of Trade to protect against price risk.
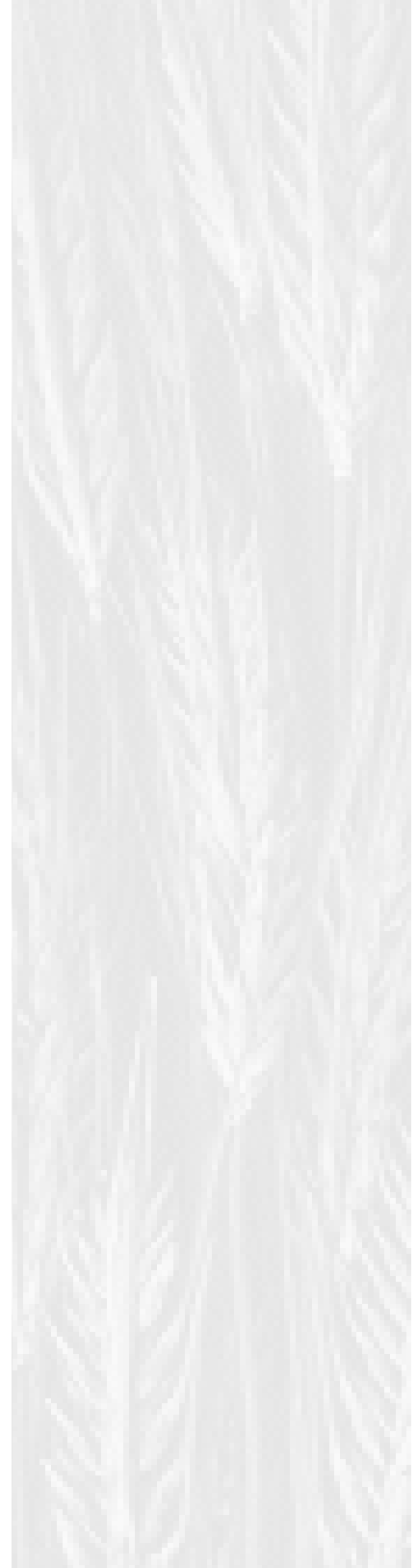
Hedging with Futures

"I thought farming was a way of life, but it is a business. It took the disaster of 1977 to show us … that we needed to do something to guarantee income."

Ron Dunphy
producer

Futures

Previous Day's Sales and Open Interest
Grains & oils

	Open	High	Low	Settle	Chng	Contract High	Contract Low
WHEAT (CBOT) 5,000 bu minimum, dollars per bushel							
Mar	3.86	3.87	3.84	3.85¾	.....	4.26¾	3.27
May	3.67½	3.67½	3.64½	3.65¾	-½	3.98½	3.25
Jul	3.41½	3.41½	3.38½	3.41¼	+¼	3.63¾	3.11
Sep	3.45	3.46¼	3.44¼	3.46	.....	3.65	3.39
Act Sales 16,649							
Prv Open Int 63,898							
CORN (CBOT) 5,000 bu minimum, dollars per bushel							
Mar	2.32¾	2.32¾	2.32	2.32½	+¼	3.64½	2.20½
May	2.40	2.40	2.39½	2.39½	.....	3.56½	2.28
Jul	2.45¼	2.45¼	2.44¼	2.44¼	-½	2.85¼	2.32½
Sep	2.49	2.49¼	2.48¼	2.48¾	.....	2.55¼	2.38
Dec	2.52	2.52½	2.51½	2.52	.....	2.63	2.35¼
Jul	2.63¾	2.65¼	2.64¾	2/65¼	+¼	2.67	2.54
Dec	2.54	2.54½	2.53½	2.54	-½	2.55	2.51
Act Sales 31,980							
Prv Open Int 280,360							
OATS (CBOT) 5,000 bu minimum, dollars per bushel							
Mar	1.22¼	1.23	1.22	1.22¾	+¼	1.52¾	1.16½
May	1.27¼	1.27¾	1.27	1.27¼	.....	1.51	1.22¼
Jul	1.32¼	1.32¼	1.32¼	1.32½	.....	1.42½	1.27¼
Act Sales 713							
Prv Open Int 13,238							
SOYBEANS (CBOT) 5,000 bu minimum, dollars per bushel							
Jan	5.52	5.53	5.51¼	5.51¼	+¼	7.04	5.37¼
May	5.70	5.71	5.68¼	5.68¾	-¼	7.05½	5.56
Mar	5.61¼	5.62	5.59½	5.59¾	-¼	7.04½	5.47¼
Jul	5.76	5.76½	5.74¼	5.74½	-½	7.06½	5.63½
Aug	5.79	5.79	5.77	5.77	-½	6.12	5.66½
Sep	5.79½	5.80¼	5.79	5.79¼	.....	6.12	5.71
Nov	5.88¼	5.88½	5.86½	5.86¾	-.01	6.50½	5.78½
Act Sales 33,572							
Prv Open Int 135,586							

The most important benefit of offsetting risk in the futures market is the ability to establish a price level for your crops well in advance of actually selling that crop. This benefit allows you to plan for a successful year and manage the effects of unforeseen factors such as market demand, world events, or even the weather.

There are two types of hedgers: the selling or short hedger and the buying or long hedger. A grain producer, someone who sells grain, is known as a short hedger. A livestock feeder, someone who buys grain and soybean feed inputs, is known as a long hedger. The long hedger is not covered in this booklet. For more information on long hedging, please refer to the CBOT booklet *Feed Cost Management for Livestock Producers*.

Short hedgers need to know two things to determine an expected selling price. First, you must know the futures price for the commodity you will be selling. For each commodity, whether it is corn, soybeans, wheat, oats, or rice, there are several futures prices listed. Each price listed represents the price for delivery during the given month. You can find futures prices in daily newspapers, through on-line computer services, or at your local elevator.

In this example, assume in May the November futures price for soybeans is $5.20 per bushel. In June, you notice the price of November soybean futures has risen to $5.50 per bushel. This price is now higher because the market expects current weather conditions to decrease the supply of soybeans. As an observant producer, you may want to take advantage of this opportunity in developing your marketing plan.

The futures price you should be interested in tracking is the month closest to, but not before, the time you actually plan to sell grain. For example, in May, producer Ron Dunphy knows he will harvest and sell soybeans in October. Since November is the nearby futures contract month — the contract month closest to the time Dunphy plans on delivering soybeans — he tracks November futures prices daily. (The Chicago Board of Trade does not trade an October soybean futures contract.) This price may change each day depending on various factors.

The second item needed to determine a selling price is the expected basis.

The basis is merely the difference between the price of grain at your local elevator and the futures price. The reasons for the difference between the prices are transportation costs if you actually sent the grain to

Chicago (which you will not do), storage costs, and the difference between local and worldwide supply and demand for your commodity. In any event, this difference in price plays an important part in the money you are actually paid for your crop when dealing in the futures market.

Local cash price	$5.35/bu
Futures price	-$5.50/bu
Basis	-$ .15

In this case, the basis is 15 under the November futures contract. In other words, the local cash price is 15 cents lower than the futures price.

Basis is fairly stable and predictable. Even though prices can vary greatly from year to year, the basis, or difference between the local cash price and futures price, varies relatively little. With hedging, you are most concerned with the basis when you actually sell your crop. For example, producer Dunphy (mentioned earlier) will want to predict the October basis, since that is the month he will be selling his soybeans. He will compare the local price in October with the November futures price. This difference will help him calculate what his selling price range will be at the time of sale. We'll discuss how this is determined a little later.

Determining the Basis

The best way to determine your expected basis is to examine your historic basis.

You can use the average of the basis for the past several years. For example, if in early October last year, your local cash price was 18 cents below the November futures, with previous years at 21 cents below and 17 cents below, you can average the three years to come up with a reasonable expected basis level for the current year.

Another way to determine the expected basis is to look at years that most closely resemble the current year. For example, if the current year is a drought year, look at the basis during past drought years.

County and state extension services can also be a good source of basis information. Local grain elevators can sometimes supply you with a history of cash prices paid at a particular time during the past years.

Basis is unique to a particular location, so it is always best to use your local basis in predicting expected basis. Remember that basis cannot be predicted precisely. But by using one or a combination of methods we have discussed, you should be able to calculate a reliable projection.

Historic Basis Table
Smithfield Elevator — Thursdays
(Smithfield Elevator Cash Price — CBOT Nearby Futures Price)

January	5	-18
	12	-20
	19	-19
	26	-21
February	2	-22
	9	-21
	16	-23
	23	-20
March	2	-19

Basis Movement

Strengthen
(less negative or
more positive)

20

10

0

-10

-20

Weaken
(less positive or
more negative)

Cash prices
increase
relative to
futures prices

Cash prices
decrease
relative to
futures prices
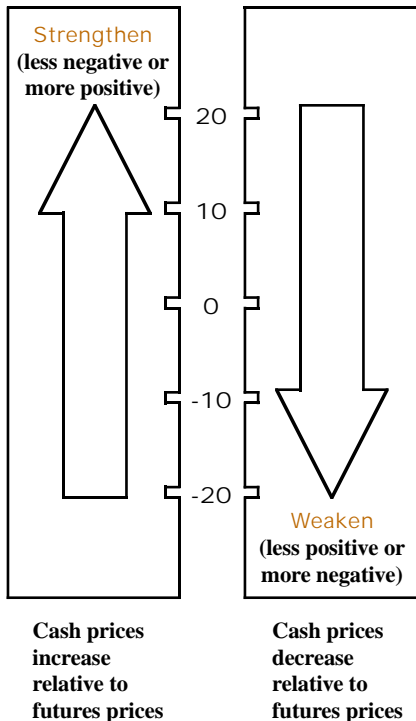
Many elevators also offer basis con-
tracts. A basis contract allows a pro-
ducer to fix a future basis today.
For example, an elevator might offer
a basis contract for October delivery
of -18 (or 18 cents under the
November futures contract). If a
producer enters into this contract, he's
assured a basis of -18 instead of an
imprecise projection.

Determining the Expected Selling Price

To determine your expected selling
price, add your expected basis to the
current futures price.

Expected Selling Price Formula

Futures Price	+	Expected Basis	=	Expected Selling Price

For example, if on May 15 producer
Dunphy sees November soybean
futures are trading at $5.50, and he
expects the basis during the first week
of October to be 20 cents under
November futures (-20), he can lock
in an expected selling price of $5.30.

Nov. Futures Price	+	Expected Basis	=	Expected Selling Price
On May 15 $5.50	+	Oct. 1 -$.20	=	For soy-beans delivered Oct. 1 $5.30

Once a futures hedge is placed, the
only thing that can affect the expected
selling price is a change in the basis.

If the actual basis is weaker or less pos-
itive/more negative than the expected
basis figure, the actual sales price will
be lower. If, for example, the actual
basis turned out to be -22 cents, then
the actual selling price would be $5.28,
not $5.30, per bushel.

Futures Price $5.50	+	Weaker Actual Basis -$.22	=	Lower Actual Selling Price $5.28

If, on the other hand, the actual basis
is stronger or more positive/less
negative than the expected basis, the
actual selling price will be higher.
For example, if the actual basis was
-17 cents, the actual selling price
would be $5.33, not $5.30.

Futures Price $5.50	+	Stronger Actual Basis -$.17	=	Higher Actual Selling Price $5.33

While hedging in the futures market
allows you to offset price risk, you
still have basis risk until the cash
transaction is made. However, basis
risk is usually easier to predict and
less volatile than price.

Now that you have read to this point in
the workbook, you should have a basic
understanding of basis. Fill in the
blanks on page 9 in Section 2 of the
Producer Work Sheet concerning
"Tracking Basis" and "Determining an
Expected Basis" using information re-
garding your own production situation.

Tracking Basis and Determining an Expected Basis

Basis is the relationship between your local cash price and the futures price. Tracking your local basis will provide you with valuable marketing information. On a given day each week (Tuesday, Wednesday, or Thursday is recommended), find out what your local price is. Then find the settlement price for the nearby futures contract on that same day. Start by making your entries in the table below. Then create your own basis table.

Sample

Week	Date	Local Cash Price	-	Nearby Futures Price	=	Basis
1	_____	_____	-	_____	=	_____
2	_____	_____	-	_____	=	_____
3	_____	_____	-	_____	=	_____

You should construct this table on a separate sheet of paper so you can continue keeping accurate basis records.

By examining your historic basis, you can estimate what your future basis might be. If you haven't tracked your local basis in the past, try to complete this section by using regional basis figures from your Cooperative Extension Service or local elevator.

When will you most likely sell in the cash market? Cash sale date _____(A)

What is the historic basis for this time period during the past 5 to 10 years?

Year	Basis on Date A	Year	Basis on Date A
19_____	$_____	19 _____	$_____
19_____	$_____	19 _____	$_____
19_____	$_____	19 _____	$_____
19_____	$_____	19 _____	$_____

Are any past years very similar to this year and should therefore be emphasized?

Based on the information you have, what can you reasonably expect your basis to be during time period "A" this year? _____

Note: Remember, some elevators offer producers basis contracts that allow you to lock in a known basis level.
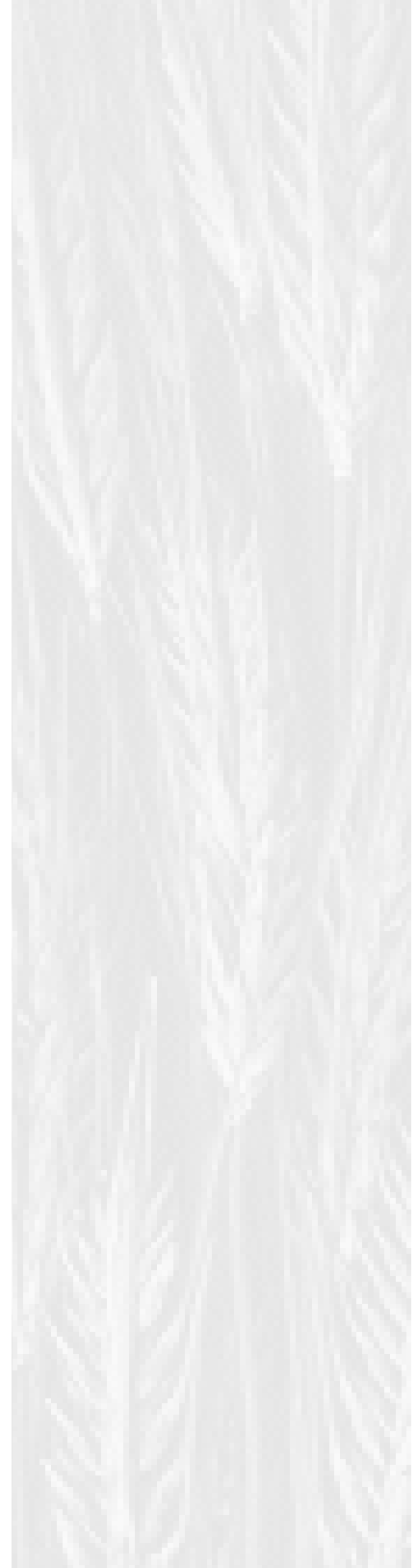
"I started out farming like dad, just using the cash markets and taking what I could get at harvesttime. But over the years I learned and practiced the marketing tools that are available and incorporated using the markets into the everyday way I do business."

Varel Bailey
grain producer

The Short Hedging Process — Locking in a Selling Price with Futures

Suppose producer Varel Bailey in east central Iowa figures his cost of production of corn to be $280 per acre, with an expected yield of 140 bushels per acre. This gives him an expected cost per bushel of $2.00.

Cost of production $280.00/acre	
Expected yield ....÷140 bu/acre	
Cost ....$ 2.00/bu	

When Bailey sees commodity prices in a range where he can make a profit, he may want to hedge a portion of his expected harvest using one of several cash or futures strategies.

The first step for Bailey is to decide when he wants to deliver the commodity. Bailey knows he will need to sell at least a portion of his crop at harvest (October) to pay off an operating loan that is due. The December futures contract is closest to, but not before, the time he wishes to sell; therefore, producer Bailey will watch the December futures price.

In March, Bailey sees that December futures are trading at $2.50 per bushel. He examines his basis charts and determines that during the past 10 years, the average basis in his area for the first week of October is 15 under December futures. That is, during the past 10 years, his local cash price during the first week of October has on average been 15 cents below the December futures price.

Bailey's elevator is offering a basis contract of -19 for October delivery, which he feels is too weak to enter into.

Using the futures equation, he calculates his expected selling price to be $2.35 per bushel if he uses futures to hedge.

Dec. Futures Price	+	Expected Basis	=	Expected Selling Price
On March 15 $2.50	+	For Oct. 1 -$.15	=	For Oct. delivery $2.35

He determines his net profit to be 35 cents per bushel based on his selling price per bushel less his cost per bushel. This seems to be a fair profit to Bailey.

Selling price $2.35/bu	
Cost . . . .-$2.00/bu	
Profit . . . .$ .35/bu	

Now that you've read up to this point in the workbook, you should have a basic understanding of tracking futures prices. To determine your expected selling price when hedging with futures, answer the questions in Section 3 of the Producer Work Sheet using your own production figures.

Tracking Futures Prices

Now that you have an expected basis for the time period you will sell your crop, you can follow futures prices and figure an expected selling price using the formula:

Futures Price	+	Expected Basis	=	Expected Selling Price
_____	+	_____	=	_____
_____	+	_____	=	_____
_____	+	_____	=	_____
_____	+	_____	=	_____
_____	+	_____	=	_____

If the expected selling price moves into your target price range, you should consider marketing a portion of your crop. Compare the futures hedge price above with the cash contract prices available from your local elevator.

Brokerage Accounts

To lock in this price level using futures, Bailey will need to sell futures contracts at the Chicago Board of Trade. To do this, he has to open up an account with a CBOT member firm.

Local brokerage offices are usually the most convenient outlet for futures transactions. These offices are located in most towns and cities throughout the U.S. Some local grain elevators also provide futures brokerage services.

To be sure that you use a reputable broker, you should:

1. Contact current and past customers.

2. Check to see if the broker is registered with the National Futures Association (NFA) and that no complaints have been registered. You can contact the NFA by calling 1-800-621-3570 outside of Illinois and 1-800-572-9400 within Illinois.

Also, when you open up an account, you should inform the broker that it is a hedge only account.

Brokers charge customers a commission fee to buy or sell futures contracts. Commission rates will vary depending on the kind and amount of service offered, but are generally reasonable.
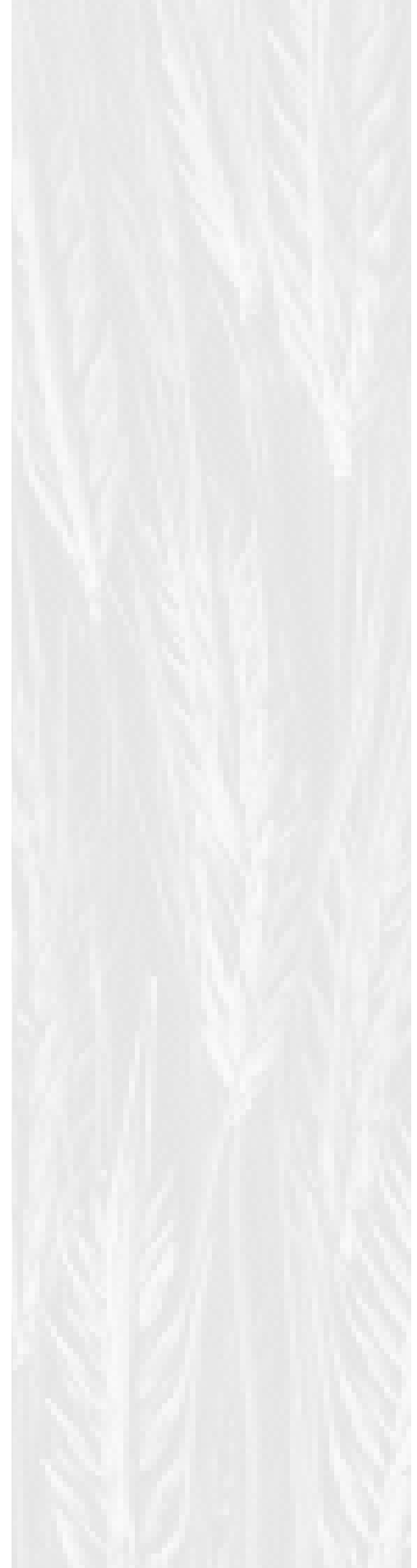
Margin Money

When you sell a futures contract, you will be required to deposit margin money into a brokerage account. Margin money is a performance bond that prevents contract default and ensures the integrity of CBOT markets. Brokers are required by law to hold customer margin money in an account separate from their operating funds. A margin account guarantees that the positions in your account will be honored.

Margin money required to sell a contract varies, but is normally a small percentage of the total value of the contract. If Bailey sells a futures contract at a given price and the price subsequently moves lower, money will be deposited into his margin account. If instead the price moves higher, above the price at which he sold, money will be deducted from his account.

If the price moves too far above the price at which he sold, Bailey may receive a margin call and be required to deposit more money into his margin account. However, a margin call tells Bailey that the price of his crop is increasing. The status of his margin account will have no effect on the final outcome of his hedge. Remember, only a change in the expected basis can affect the final selling price.

Initiating a Hedge

To initiate his futures hedge, producer Bailey calls his broker and asks him to sell four December corn contracts (5,000 bushels each, totaling 20,000 bushels). In the futures market, it is possible to sell before you buy or own because you are not selling the actual commodity but a commitment instead.

5,000 bushels	
5,000 bushels	} 4 corn contracts
5,000 bushels	20,000 bushels total
5,000 bushels	

Bailey's broker informs him that the current margin for corn is $1,000 per contract, so Bailey deposits $4,000 into his margin account. This is not a brokerage fee but a deposit of funds held in an account to ensure performance.

Bailey's broker informs him that his order was filled at $2.50 per bushel. He is now short four December corn contracts at $2.50 and has locked in a selling price level for the October sale of his corn.

By assuming a short position in December futures, Bailey must fulfill his contract obligation in one of two ways:

1. Bailey can deliver 20,000 bushels of corn to a CBOT- approved delivery site (less than 2 percent of futures contracts result in delivery).

2. Bailey can use the most common way of fulfilling a futures contract obligation — offset by taking an opposite position. Since Bailey initially sold December futures contracts, he would need to buy December corn futures to offset his position.

Assume from March to April the price of corn rises, and on April 15, Bailey's broker calls to tell him he has received a margin call and must deposit $1,200 into his margin account. While some hedgers might be concerned with a margin call, Bailey is comfortable because he knows his October sale is locked into a profitable price level ($2.35) and the unhedged portion of his crop has gained in value.

From May through harvest, the corn belt experiences favorable growing conditions, causing the price of corn to fall and Bailey's margin account to gain in value.

Delivery and Offset

On October 10, when Bailey harvests his corn, the price of December corn futures has fallen to $2.00 per bushel, with his local elevator offering $1.86 per bushel (-14 cents basis). So he delivers his corn and is paid $1.86 per bushel by the local elevator.

At the same time, he contacts his broker and asks him to liquidate his futures position by placing an order to buy four December corn contracts. The broker later calls to let Bailey know his order was filled at $2.00 per bushel. While the price of December corn futures was falling over the summer, Bailey's margin account was gaining in value. On October 10, when Bailey liquidates his short position, his margin account has gained in value by a total of 50 cents per bushel.

Because Bailey sold December futures contracts at $2.50 per bushel in March and later bought December corn futures for $2.00 per bushel in October, he receives a total futures profit of 50 cents per bushel (this does not take into account commission fees). Buying the December futures contracts offsets Bailey's short futures position. He is no longer obligated to deliver any commodity to a CBOT delivery location.

March	October	Futures
Sells Dec. futures	Buys Dec. futures	Transaction profit
$2.50/bu	-$2.00/bu	$.50/bu

The gain in the futures market offsets the decrease in the cash market price. By adding the 50-cent gain from his futures to the $1.86 received from his elevator, Bailey realizes a net price of $2.36 per bushel.

Local elevator sale	.$1.86/bu
Futures gain	+$ .50/bu
Net sales price	.$2.36/bu

This is a penny higher than his expected price level of $2.35 because the actual basis when he delivered his corn was -14 cents instead of the -15 cents he had expected. Had the actual basis when he delivered the corn been weaker (lower) than -15 cents, he would have received a lower net price for his corn.

Again, when you hedge with futures, you offset price risk but not basis risk. Had the price of corn increased over the summer instead of decreased, the result would have been the same as long as the basis was the same. For example, say Bailey's elevator was offering $2.75 per bushel for corn with December futures at $2.89. In this case, Bailey could sell his corn at the elevator for a higher price ($2.75), but he would have a 39-cent loss on his futures position.

March	October	Futures
Sells Dec. futures $2.50/bu	Buys Dec. futures -$2.89/bu	Transaction loss $.39/bu

Yet applying the 39-cent loss on his futures position to the higher cash price paid at his local elevator still gives him a net sales price of $2.36, which is within 1 cent of what he had expected.

Local elevator sale	$2.75/bu
Futures loss . . . . -	$ .39/bu
Net sales price	$2.36/bu

This situation can frustrate short hedgers, but it is important to remember that when you place a short hedge using futures, you have complete protection against falling prices. At the same time though, you give up the opportunity to benefit from an increase in prices.

Using the futures market, Bailey was effectively able to lock in his target price level of $2.35. In fact, because of a strengthening basis, he realized a better profit than expected.

Hedging with Futures Sample Problem

Here is a sample problem to help you better understand the process of short hedging with futures.

Say you are a corn producer. In July, you decide to hedge the sale of a portion of your crop for delivery in the fall. You determine that you need $1.90 per bushel to cover your cost of production plus make a reasonable profit. Your expected basis for October is -20. The December futures price for corn is $2.55 per bushel. What action will you need to take in the futures market? Fill out the first level of a T-account with this information.

Problem #1:

	Cash	Futures
July	_____	_____

What price will you receive for your fall sale if the actual basis is as expected?

Futures Price	+	Expected Basis	=	Expected Selling Price
_____	+	_____	=	_____

By October, the local elevator price for corn has declined to $1.91 per bushel. You sell your corn for that cash price, and you buy a futures contract at $2.10 per bushel to offset your hedge. Bring down information from the first level of the T-account and fill in the second level.

Problem #2:

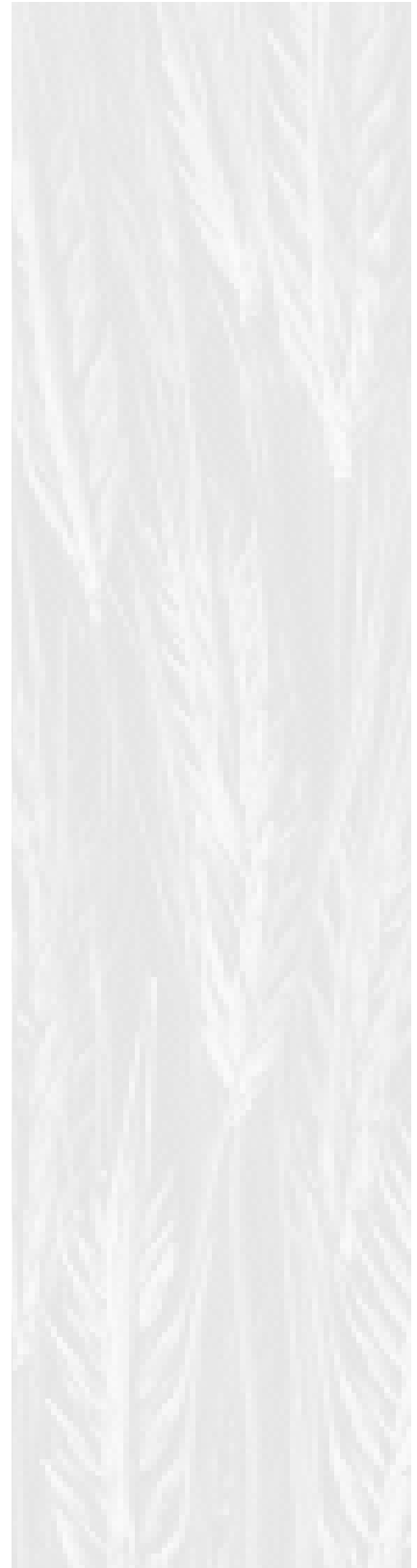|	Cash	Futures	Basis
July	_____	_____	_____
October	_____	_____	_____
Result:	_____	_____	
	gain/ loss	change	

Using the results from the T-account, determine your net selling price using the formula below:

Net Selling Price Formula

Cash Price	+	Futures Gain/Loss	=	Net Selling Price
_____	+	_____	=	_____

Answers to these problems can be found on page 24.

Hedging with Options

In our earlier example, you'll remember that Bailey was able to protect himself from declining prices using a short futures hedge. However, if prices rose over the course of the hedge, he was not able to take advantage of the higher prices.

There is another basic way to hedge in the futures market. This alternative is also more comfortable for some producers because it is much more like buying an insurance policy to protect against declining prices. And it allows you to profit if prices should happen to increase.

This alternative is known as hedging with a put option. A put option allows short hedgers such as corn producers to establish a floor or minimum selling price. A short hedger buys a put option by paying a premium, much like an insurance policy. There is no margin account or margin money required to buy an option. For this premium, the buyer has the right to sell a futures contract at a predetermined price, known as the "strike" price. There are also options for buyers of commodities called call options, which allow a buyer to purchase a futures contract at a predetermined price. Because call options are primarily used by long hedgers — those interested in buying grain — they will not be discussed in this workbook.

Here are a few other elements of options:

• Options are listed for each of the contract months of a commodity. For example, for corn, there are December puts, March puts, May puts, etc.

• Options expire the month before the futures contract. In other words, a December corn put expires in November.

• Options are listed in various increments for each commodity. For example, corn, oats, and wheat are listed in 10-cent per bushel increments. Soybeans are listed in 25-cent per bushel increments. And rice options are listed in 20-cent per hundred weight increments.

• Options are listed in increments above and below the price at which futures are trading. For example, if May corn is trading at $2.53 per bushel, call and put options would be listed at $2.60, $2.70, $2.80, etc. and below at $2.50, $2.40, $2.30, etc. Options can only be bought at these strike price increments.

• Option buyers pay option sellers a premium, much like insurance buyers pay a premium to the insurance company.

• Option premium can be divided into two parts: intrinsic value and time value. Intrinsic value is the "built-in" value of an option. It is the difference

between the option strike price and the underlying futures price. For example, the intrinsic value of a $2.50 December corn put when December corn futures are trading at $2.40 is 10 cents ($2.50 strike price - $2.40 underlying futures price). The holder has the right to sell at $2.50, while the market is trading at $2.40, so the $2.50 put has a "built-in" value of 10 cents. If December corn futures were trading at $2.56, the $2.50 put would have no intrinsic value.

Time value is equal to the option premium less intrinsic value. If a $2.50 December corn put sold for 34 cents when December corn was trading at $2.40, the put would have 24 cents of time value ($.34 premium - $.10 intrinsic value = $.24 time value). For options with no intrinsic value, the entire premium equals time value.

• Options are traded at the CBOT via open outcry in trading pits just as futures are traded. Therefore, you must use a CBOT member firm to buy or sell options.

• Serial options give you added flexibility in your price risk management. These short-term options fill in the months not in the regular commodity cycle, providing year-round risk management and trading opportunities. For example, in addition to the March, May, and July corn standard options, serials provide expirations in April, priced in terms of May futures, and June, priced in terms of July futures.

Short Hedging with Put Options

Short hedging with a put option allows producers to establish a floor price. With this floor:

1. If prices fall, you are protected.

2. If prices rise, you have the opportunity to sell at the higher price.

To establish a floor price, you pay a premium in order to buy a put option.

The buyer of the put option is buying the "right" to sell a futures contract at a predetermined price, known as the "strike" price. The put option seller is obligated to buy a futures contract. Think of this situation as buying an insurance policy. Paying an insurance policy's premium gives you the right to make a claim against the policy. The insurance company (the policy seller) is obligated to pay on that claim.

Short Hedging with Options Versus Futures

Short hedging with put options differs from short hedging with futures in that when you sell a futures contract, you are obligated at that price. If you purchase a put option, you have the right to sell futures at a strike price, but you are not obligated. If prices fall, you can exercise the put and sell futures at the strike price. But if prices rise (above the strike price), you won't exercise the option, because it is advantageous to sell at the higher price.

Commodity Option Prices

Dec. Corn (CBOT)
5,000 bu., cents per bu.

Strike	Put	Call
220	3 5/8	33
230	6 3/4	26 1/4
240	11 5/8	20 1/2
250	17 1/4	16 7/8
260	24	13 3/4
270	31 1/2	11 1/4

Another difference between options and futures is that when you buy a put option, you pay just one up-front premium. You do not have to maintain a margin account during the term of the option.

Put Options at Work

Using the example of Bailey from before, let's see how he would hedge the sale of his October corn using a put option.

In March, December corn futures are trading at $2.50. Expected basis in October is 15 under (corn is expected to be 15 cents lower than the December futures price at the local elevator during the first week of October). This time, instead of selling futures, Bailey decides to buy a $2.50 December put option, which gives him the right but not the obligation to sell December corn futures at $2.50.

Bailey calls his broker, who confirms the purchase of the $2.50 December put for 20 cents (the amount of premium per bushel). Bailey pays the broker a one-time premium of $1,000 ($.20 x 5,000 bushels) plus a commission to buy the put. He does not need to post margin because he is an option buyer.

In purchasing the $2.50 December put, Bailey has established a floor or minimum selling price of $2.15 per bushel for his October corn. To find this floor price, we use the following formula:

Put Options Floor Price Formula

Put Strike	+	Expected Basis	-	Put Pre- mium	=	Expected Selling Price
$2.50	+	(-$.15)	-	$.20	=	$2.15/bu

Similar to futures hedging, once the put is purchased, the only variable that could raise or lower the minimum expected selling price is a change in the basis.

Now that you've read up to this point in the workbook, you should have a basic understanding of options. To see how hedging with put options can help you, take the time to answer the questions in Section 4 of the Producer Work Sheet using your own production information.

Simple Options Hedge

Buying a put option allows you to establish a minimum selling or "floor" price and still benefit if prices should rise. The following work sheet will help you to better understand how a put option can work for you.

What is the current futures price for when you plan to sell?_____

This will be the futures contract that is closest to, but not before, the day you expect to sell/deliver your crop.

In the space below, list the put option strike prices above and below the current futures price, along with the corresponding premium.

Put Strike Price	-	Premium	+	Basis	=	Floor Price
_____	-	_____	+	_____	=	_____
_____	-	_____	+	_____	=	_____
_____	-	_____	+	_____	=	_____
_____	-	_____	+	_____	=	_____
_____	-	_____	+	_____	=	_____

As you can see, each strike price will give you a different floor price. By comparing the change in floor price to the change in premium for the different strikes and taking into consideration your own goals and market outlook, you can determine which strike is most appropriate for you.

Hedging with options is similar to hedging with futures in that price level risk is eliminated. However, basis risk remains until there is a cash sale. But once again, basis risk is usually less than price risk.

In Bailey's case, by the time he is ready to sell at harvest in October, corn prices have fallen. When he delivers his corn to his local elevator, he receives $1.86 per bushel. On the same day, December corn futures are trading at $2.00 per bushel. Bailey holds a $2.50 put option, which gives him the right to sell December corn futures for $2.50. He could exercise this right and enter into a short futures position. Instead, he decides
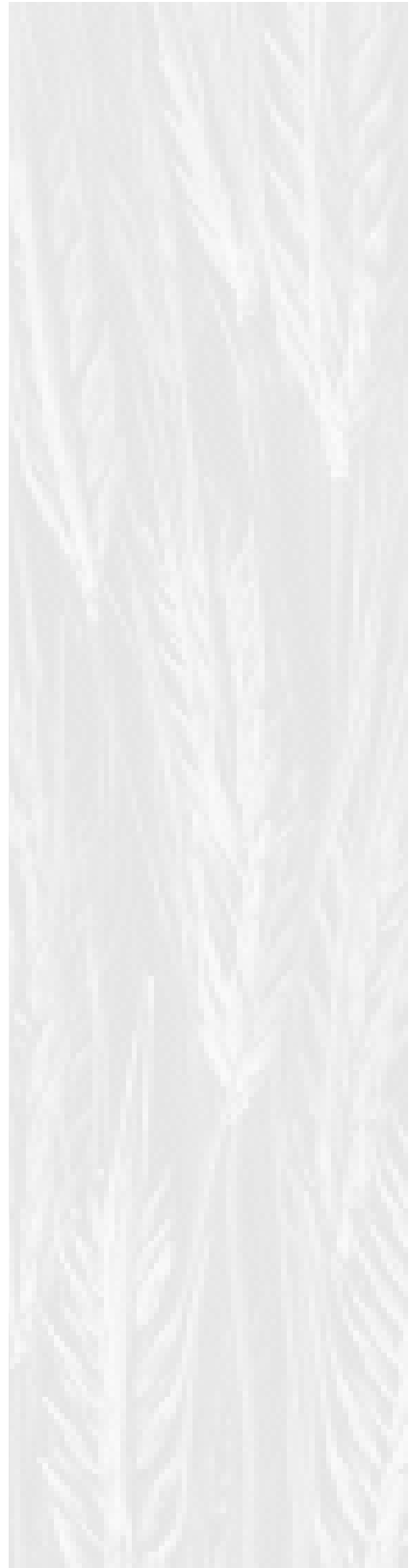
to offset* his position by placing an order with his broker to sell a $2.50 December corn put option, which yields 50 cents per bushel. Because the option is near expiration, we are assuming there is no time value remaining. Bailey nets 30 cents per bushel after paying the 20-cent premium.

March 15	October 7	Net Gain
Buys $2.50 Dec. put $.20/bu	Sells $2.50 Dec. put $.50/bu	$.30/bu

*In the examples, you will notice Bailey chooses to offset his option positions rather than exercising them. This is common because:

• Exercising an option will yield only its intrinsic value. Any time value that remains will be forgone unless it is offset.

• An extra brokerage commission may be incurred when exercising an option.

Bailey can apply the 30 cents per bushel earned in the option market toward his cash selling price, yielding an actual net selling price of $2.16 per bushel.

Local cash price $1.86/bu	
Option gain ($.50 sale price - $.20 purchase price) . . . .+$ .30/bu	
Net sales price $2.16/bu	

The actual sales price is a penny higher than the expected price because the basis was 1 cent stronger than expected. In this case, where prices fell, the $2.16 net selling price Bailey received hedging with a put option is lower than the $2.36 he would have received hedging with futures. The difference is the 20 cents premium he paid. Remember, though, with the option hedge, Bailey retained the opportunity to benefit from an increase in prices. Now, if corn prices had risen from March to October instead of falling, Bailey could have taken advantage of the higher prices.

Suppose in October Bailey's local elevator is offering $2.75 per bushel for corn and December futures are trading at $2.89. Since the put's strike price of $2.50 is below the current $2.89 futures price, Bailey decides to hold on to the put in case it increases in value before it expires in mid-November, and he goes ahead and sells corn at the local elevator for $2.75 a bushel. Under this market scenario, Bailey's net selling price is $2.55.

Local cash price $2.75/bu	
Option premium paid ....- $ .20/bu	
Net sales price $2.55/bu	

Under this market scenario of rising prices, Bailey received a better price ($2.55) than he did when he hedged using futures ($2.36). As you'll recall from an earlier section, Bailey earned $2.36 a bushel for his corn when he hedged by selling futures and prices rose by delivery time.

Even though prices didn't fall in this example, the put option gave Bailey the protection he needed. Again, a put option is like an insurance policy. You'd rather not use it, but it's good to know the protection is there in case prices fall.

Hedging with Options
Sample Problem

Problem #1:

Suppose you are producing corn and you want to establish a minimum floor price for your crop when December futures are trading at $2.40 a bushel. Given the strike prices and premiums below and a -10 expected basis, what is the minimum floor price you can expect?

Strike Price	- Premium	+	Expected Basis	=	Expected Floor Price
$2.30	- $.03	+	-$.10	=	$_____
$2.40	- $.07	+	-$.10	=	$_____
$2.50	- $.13	+	-$.10	=	$_____
$2.60	- $.21	+	-$.10	=	$_____

Problem #2:

In June, you pay a premium of 25 cents per bushel for a November soybean put option with a $5.50 strike price.

Determine what your net return will be if in October, when you sell your beans and liquidate your option position, November bean futures are at $5.05 and the local basis is 15 under.

Since you're liquidating your position in October, close to option expiration, we're assuming the option premium is made up only of intrinsic value. No time value remains.

June	Buy $5.50 Nov. put @ $.25 (Nov. futures @ $5.50)
October	Sell $5.50 Nov. put @ $.45 Sell cash beans @ $4.90 (Nov. futures @ $5.05)
Result	Nov. futures price . . . . $5.05 Basis . . . . - $ .15 Cash sale price . . . . . . $4.90 Options profit (sold Nov. put $.45 - bought Nov. put $.25) . . . . .+ $ .20 **Net sale price** $5.10

What would your net sale price be if in October the November futures price was $4.50? $6.30?

Nov. futures price $4.50

Basis . . . .$_____

Cash sale price . . . .$_____

Options profit or loss . . . .$_____

Net sale price . . . .$_____

Nov. futures price $6.30

Basis . . . .$_____

Cash sale price . . . .$_____

Options profit or loss . . . .$_____

Net sale price . . . .$_____

Answers to these problems can be found on page 24.

Putting It All Together

There are many risks you cannot manage, such as the weather, supply and demand for crops, and world events. But there are risks you can manage, such as the price you receive for your crops. Today, successful farmers must manage these risks if they are to stay in business. Learning about and using short hedging with futures or options can help you offset price risk.

This introductory workbook provides you with the basics of short hedging with futures and options.

Learning More About Futures and Options

From here, there are several steps you can take to become more knowledgeable and comfortable with the futures markets:

• Join a marketing club. By meeting with other producers to discuss different selling strategies, you can sharpen your marketing techniques and take action on opportunities in the commodities markets.

• Paper trade for a period of time. Do all the preparation and formulation of short hedging with futures or options but without actually making transactions with a broker and determine what your outcome would be.

• Attend marketing seminars and workshops whenever possible.

• Seek help from a broker, county agent, elevator operator, or other marketing expert. Many times these experts can give you a perspective in your local area on subjects like production costs, basis, expected price levels, etc. They can also give you some advice on how to start out slowly in marketing in order for you to become more comfortable with the process.

• Discuss your marketing plan with your ag lender so that he or she fully understands your objectives.

Once you've mastered the basics of short hedging presented in this booklet, the Chicago Board of Trade has a follow-up publication: *Agricultural Futures and Options: A Home Study Course*. Also, producers whose comments are featured in this workbook appear in a video. To order the video—*Taking Control of Your Future*—call 800-THE-CBOT.

Futures and Options at a Glance

Futures

- Protected against falling price level.

- Used to establish a price level.

- Buyer and seller must each post margin money.

- Buyer and seller can each receive margin calls.

- Cost to establish a position includes:
  - Brokerage commission.
  - Forgone interest earnings on margin funds.

- No chance of taking advantage of rising prices if prices move higher after short position (selling price level) is established. Hedger will always receive short futures price plus the basis.

Options

- Put used to establish a minimum selling price (floor). Call used to establish a maximum buying price (ceiling).

- Option buyer does not post margin money. Option seller is required to post margin money.

- Option buyer will never receive a margin call. Option seller can receive margin calls.

- Cost to purchase option (establish floor or ceiling):
  - Brokerage commission.
  - Option premium.

- Put buyers can benefit from rising prices when prices rise above the strike price plus the premium paid.

Formulas Used in Workbook

Basis

Local Cash Price	-	Futures Price	=	Basis

Expected Selling Price

Futures Price	+	Expected Basis	=	Expected Selling Price

Net Hedged Sale Price

Cash Sale Price	+	Futures Gain/ Loss	=	Net Selling Price

Put Options Floor Price

Put Strike	+	Expected Basis	-	Put Premium	=	Expected Minimum Selling Price

Glossary

The following terms are commonly used in the trading of futures and options.

Basis - The difference between the price of a cash commodity at a specific location and the price of a futures contract for that commodity. Basis reflects factors such as transportation costs between the location and the futures delivery point, local supply and demand conditions, and storage.

Clearing House - An organization associated with a futures exchange that clears trading activity to make sure buyers' and sellers' records agree and that the contracts are honored. At the Chicago Board of Trade, this function is performed by the Board of Trade Clearing Corporation.

Commission - Fees paid to a broker for execution of an order.

Hedge - The sale of futures against ownership of a cash commodity to protect against a decline in the commodity's value; conversely, the purchase of futures against anticipated need for a cash commodity to protect against an increase in the commodity's value.

Long - A buyer; one who has bought a futures contract and has not yet offset that position. In theory, a "long" has agreed to buy and take delivery of a commodity in the future.

Margin - A deposit required from both the buyer and seller of a futures contract to ensure they honor any financial liability they incur. Margin is earnest money, not a down payment on the commodity. Option buyers pay the entire premium upon purchase and do not post margin, whereas option sellers do post and maintain margin.

Offset - To liquidate a futures position with a transaction that is equal and opposite to the original transaction. A futures purchase is offset by a later sale of the same quantity and delivery month, and a futures sale is offset by a later purchase of the same quantity and delivery month. Options are offset by taking the opposite position for the exact same option contract.

Short - A seller; one who has sold a futures contract and has not yet offset that position. A "short" has agreed to sell and deliver a commodity in the future.

Terms Specific to Options

At-the-Money - A put or call option whose strike price is equal — or approximately equal — to the current market price of the underlying futures contract.

Break-Even Point - The futures price at which a given option strategy is neither profitable nor unprofitable. For call options, it is the strike price plus the premium. For put options, it is the strike price minus the premium.

Buyer - The purchaser of either a call or put option. The buyer also may be referred to as the option holder. Option buyers receive the right, but not the obligation, to enter into a futures market position.

Call Option - An option that gives the option buyer the right to purchase (go "long") the underlying futures contract at the strike price on or before the expiration date.

Exercise - The action taken by the holder of a call if he wishes to purchase the underlying futures contract or by the holder of a put if he wishes to sell the underlying futures contract.

In-the-Money - A put or call option that currently has intrinsic value. That is, a put whose strike price is above the current futures price or a call whose strike price is below the current futures price.

Out-of-the-Money - A put or call option that currently has no intrinsic value. That is, a call whose strike price is above the current futures price or a put whose strike price is below the current futures price.

Premium - The price of a particular option contract as determined by open outcry between buyers and sellers on the trading floor of a commodity exchange. Premium does not include related brokerage commission fees. The premium is the maximum amount of potential loss to which the option buyer may be subject.

Put Option - An option that gives the option buyer the right to sell (go "short") the underlying futures contract at the strike price on or before the expiration date.

Seller - The seller of either a call or put option. Also referred to as the writer or grantor. Option sellers are obligated to enter into a futures position if they are exercised upon.

Serial Options - Short-term option contracts based on the nearby futures and trading for approximately 30 days to expire during months not in the regular commodity cycle.

Strike Price - The price at which a holder of a call (or put) may choose to exercise his right to purchase (or sell) the underlying futures contract.

Answers to Problems

Page 15, Problem #1

	Cash	Futures
July	_____	Sell Dec. corn futures @ $2.55

What price will you receive for your fall sale if the actual basis is as expected?

Futures Price	+	Expected Basis	=	Expected Selling Price
$2.55		-.20		$2.35

Page 15, Problem #2

	Cash	Futures	Basis
July		Sell Dec. corn futures @ $2.55	Expected basis -$.20
October	Sell corn locally @ $1.91	Buy Dec. corn futures @ $2.10	Actual basis -$.19
Result:		$.45 gain	$.01 strengthened

Net Selling Price Formula

Cash Price		Futures Gain		Net Selling Price
$1.91	+	**$.45**	=	**$2.36**

Note: Net selling price is 1 cent higher than the expected selling price because the actual basis is 1 cent stronger than expected.

Page 21, Problem #1

Strike Price	-	Expected Premium	+	Basis	=	Expected Floor Price
$2.30	-	$.03	+	-$.10	=	$2.17
$2.40	-	$.07	+	-$.10	=	$2.23
$2.50	-	$.13	+	-$.10	=	$2.27
$2.60	-	$.21	+	-$.10	=	$2.29

Page 21, Problem #2

Nov. futures price . .$4.50
Basis . . . .-$.15
Cash sale price $4.35
Options profit . . . .$.75 (sell put @ $1.00 buy put @ $.25)
Net sale price $5.10

Nov. futures price . .$6.30
Basis . . . .-$.15
Cash sale price $6.15
Options loss . . . . . .-$.25 (buy put @$.25)
Net sale price $5.90