

DEPARTMENT OF AGRICULTURAL ECONOMICS

Introduction to Options

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Options give the agricultural industry a flexible pricing tool to assist in price risk management. They offer a type of insurance against adverse price moves, require no margin deposits for buyers, and allow buyers to participate in favorable price moves. Commodity options are adaptable to a wide range of pricing situations. For example, agricultural producers can use commodity options to establish an approximate price floor, or ceiling, for their production or inputs. With today's large price fluctuations, the financial payoff in controlling price risk and protecting profits can be substantial.

What is an Option?

An option is simply the right, but not the obligation, to buy or sell a futures contract at some predetermined price within a specified time period. There are two types of options. An option to buy a futures contract (go "long") is known as a call option, while an option to sell a futures contract (go "short") is referred to as a put option. Options allow one to take advantage of changes in futures prices without actually having a position in the futures market. The predetermined price at which the futures contract may be bought (for a call) or sold (for a put) is called the strike or exercise price.

It is important to understand that for every option buyer there is an option seller. At anytime before the option expires, the option buyer can exercise the option. Effectively, the buyer of a put option can convert an option position into a short futures position, established at the strike price, by exercising the put option. Similarly, the buyer of a call option can convert an option position into a long futures position, established at the strike price, by exercising the call option.

The option buyer also can sell the option to someone else or do nothing and let the option expire. The choice of action is left entirely to the option buyer. The option buyer obtains this right by paying the premium to the option seller.

What about the option seller? The option seller receives the premium from the option buyer. If

the option buyer exercises the option, the option seller is obligated to take the opposite futures position at the same strike price. Because of the seller's obligation to take a futures position if the option is exercised, an option seller must post a margin and faces the possibility that the margin will be called if the market moves against his potential futures position.

Trading Options

Option contracts are traded in much the same manner as their underlying futures contracts. All buying and selling occurs by open outcry of competitive bids and offers in the trading pit on the floor of the exchange. Thus, option prices or premiums are not predetermined, but rather are determined by the interaction of option buyers and sellers at the exchange.

There are several important facts to remember when trading options. Most important, trading a call option is completely separate and distinct from trading a put option. Calls and puts are separate contracts, not opposite sides of the same transaction.

At any given time, there is simultaneous trading in a number of different call and put options for a given commodity such as corn or cattle. For example, there are different option contracts for different futures delivery months and different strike prices. Option delivery months are typically the same as those of the

underlying futures contract. However, there may not be an option delivery month listed for each futures contract currently trading, for example some of the more distant delivery months.

To clarify, note that a December Chicago Board of Trade (CBT) corn put with a \$2.25 strike price and a December corn put with a \$2.50 strike price are actually different option contracts. Similarly, a December CBT corn call with a \$2.50 strike price and a March CBT corn call with a \$2.50 strike price are also different option contracts. Options generally expire about 1 month before the corresponding underlying futures contract expires.

As an example, let us say that trader A thinks that corn prices are going to move substantially higher in the near future, but at the same time, he wants to limit his risk in case he is wrong. One strategy that he could use would be to buy a call option. In this example, let us say that it is currently the month of May, the September corn futures price is currently trading at \$2.40 per bushel, and a September \$2.40 call is trading at \$0.10 per bushel as seen in Figure 1.

Figure 1.

May	
September corn futures.	\$2.40
September corn \$2.40 call premium	\$0.10

If trader A decides to buy the call option, he would call his broker and tell him to buy the September \$2.40 call option, either at the market, or at some specific price such as \$0.10 per bushel. If he bought the call option for a premium of \$0.10 per bushel, then he would need to have enough money in his account to pay the premium (5,000 BU. X 0.10 = \$500.00) plus commission (which could range from \$25.00 to \$100.00, in this case let's use \$50.00 per contract or \$0.01 per bushel). By purchasing this call option, trader A has the right to buy a September futures contract at \$2.40 per bushel. The seller of the option contract receives the premium and is obligated to take a short futures position at \$2.40 per bushel in the September futures contract if the buyer wants his long position.

In scenario 1, let us say that by July the September futures price has risen to \$3.50 per bushel. Trader A's September \$2.40 call option has a value of at least \$1.10 (\$3.50 - \$2.40 = \$1.10) as seen in Figure 2. At this point, trader A could sell his option to someone else for \$1.10 per bushel and be out of the market. His profit in this case would be \$0.99 per bushel (the

premium received, \$1.10, minus the premium paid, \$0.10, minus the commission, \$0.01) or \$4,950.00 per contract. As the market moved up in trader A's favor, the seller of the option was making margin calls, sending money to his broker to ensure that he had enough money in his account to cover any losses that he might incur from his potential short position.

Figure 2.

July	
September corn futures	\$3.50
September corn \$2.40 call premium	\$1.10
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Final Result	
September corn \$2.40 call premium received	\$1.10
September corn \$2.40 call premium paid	-\$0.10
Commission charge	-\$0.01
Net gain (loss)	\$0.99

In scenario 2, let us say that by mid-August, the September futures price has declined to \$2.00 per bushel. Trader A's September \$2.40 call option would now be worth close to \$0.00, as seen in Figure 3. Since trader A would not want to purchase September futures at \$2.40, with futures currently well below that level at \$2.00, he could let the option expire worthless. In this scenario, the seller of the option gets to keep the \$0.10 premium that was originally paid by the buyer. While trader A was wrong about what happened to prices in this scenario, his loss was limited to \$0.11 per bushel (premium paid \$0.10 + commission \$0.01) or \$550.00 per contract.

Figure 3.

August	
September corn futures	\$2.00
September corn \$2.40 call premium	\$0.00
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Final Result	
September corn \$2.40 call premium received	\$0.00
September corn \$2.40 call premium paid	\$0.10
Commission charge	\$0.01
Net gain (loss)	-\$0.11

Components of Option Premiums

There are two components of an option premium— intrinsic value and time value. Intrinsic value is equal to the gross profit an option buyer could earn if the option was exercised. For example, if a buyer's put option strike price is \$65/cwt. on a December live cattle contract and the current December futures price is \$63/cwt., the premium's intrinsic value is \$2/cwt. In this example, the option buyer could, theoretically, exercise the option, which would result in the delivery of a short futures position established at the strike price (in this case \$63/cwt.). The net result would be a short futures position established at \$65 and offset at \$63 for a theoretical gain of \$2 (excluding all commissions). The \$2 theoretical gain is equal to the option's intrinsic value of \$2.

Time value is equal to the option premium less the intrinsic value. In general, time value decreases as the amount of time remaining until expiration decreases. For an example of time value, examine a \$0.72 December cotton put (i.e., a put option on December cotton futures with a \$0.72 strike price) which sold for 4 cents when December cotton was trading at \$0.71. This option's intrinsic value was \$0.01 ($\$0.72 - \0.71). Therefore, this put option's time value equaled \$0.03 ($\$0.04 \text{ premium} - \$0.01 \text{ intrinsic value} = \0.03 time value). For options with no intrinsic value, the entire premium equals the time value.

Classifications of Options

There is some option trading terminology that an option trader should know, such as "in-the-money," "at-the-money," and "out-of-the-money." An option is "in-the-money" when the intrinsic value is positive. An option is "at-the-money" when the underlying futures market price equals the option strike price. An option is "out-of-the-money" when the futures price is above the option strike price for a put or below the option strike price for a call (i.e. the option buyer would have a loss in his futures position if he took it today).

Completing the Option Trade

Once a buyer establishes a position in the agricultural options market, he has three alternatives available. The buyer can let the option expire, exercise the option, or offset the option in the option market. Offsetting means canceling an option position by initiating an opposite transaction on the option trading exchange. If an option buyer exercises an option it means he will take delivery of the

underlying futures position. A put holder can offset the put anytime before expiration by selling puts in equal number at the same strike price for the same contract month.

There are several reasons option holders prefer to offset. If the option strike price is out-of-the-money, there still may be some time value to an offset premium on an unexpired contract. If the option strike price is in-the-money, the intrinsic value is equal to the value of an exercised position on the futures market plus any remaining time value. Given time value plus avoidance of futures market commission costs, returns from the offset are greater than returns from exercising.

The option holder may exercise an option any time before the expiration date of the option. Upon exercising an option, the holder is assigned a position on the futures market at the option's strike price. Of course, an option would be exercised only if it were in-the-money. A put option holder would be assigned a short futures position at the original strike price in the underlying contract and month. Similarly, a call option holder would be assigned a long position in the underlying futures contract. Upon a futures market position assignment, the trader would be required to meet initial futures market margin requirements.

An option holder may choose to just let the option expire. The option would not be exercised if it were out-of-the-money since this would result in an adverse (loss) position assignment in the futures market. If the option is far out-of-the-money, the time value left on the option offset could be less than the cost of offsetting. In this case, the option holder would allow the option to expire.

Selling Options: Caution

Most farmers and ranchers using option contracts will probably prefer to buy options as a price risk management strategy, rather than selling options. Option sellers, unlike buyers, are exposed to potentially unlimited risk. The main reason for selling options is to earn the premium paid by the option buyer. Option sellers expect the market to move in such a way that the option will not be exercised, allowing the sellers to retain the full amount of the premium. However, option sellers are protected only in the amount of the option premium, should the market move against them. For this reason, sellers of options must have margin accounts, and will have to make margin calls whenever the market is moving against them.

Producers, therefore, should consider very carefully before selling options as part of price risk management program. Producers may want to sell options only when they expect very small price changes during the life of the hedge. As an option buyer, however, the producer is at risk only for the option premium plus any brokerage commissions.

Reasons to Consider Options

As a forward pricing tool, options have several advantages as compared to hedging with futures or forward cash contracting. In particular, options offer a more flexible price insurance plan with a limit to the financial obligation. When viewed as price insurance,

option costs can be added to other production and marketing costs in determining a price objective. Hedgers can evaluate the cost of options trading and determine whether the implied price protection is worth the cost of the insurance.

A significant advantage to hedging with options is that a producer can gain from favorable price movements while being protected against the unfavorable ones. Remember, the buyer has the right, but not the obligation, to take a position on the futures market. The limited financial obligation of an options trade is another advantage. The buyer of an option pays a one-time fee, the option premium plus brokerage fee.

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