

# MU Guide

## Introduction to Hedging Agricultural Commodities with Options

Joe Parcell and Vern Pierce  
Department of Agricultural Economics

Producers of agricultural commodities regularly face price and production risk. Furthermore, increased global free trade and changes in domestic agricultural policy have increased these risks. As the variability of price and production increases the variability of revenue, producers are realizing the importance of risk management as a component of their management strategies.

One means of reducing these risks is through the use of the commodity futures exchange markets. Like the use of car insurance to hedge the potential costs of an accident, agricultural producers can use the commodity options markets to hedge the potential costs of commodity price volatility. However, as with car insurance, where the payments from a small insurance claim might not exceed the cost of the premiums paid, the gains from hedging agricultural commodities might not cover the costs of hedging. The primary objective of hedging is not to make money. The primary objective of hedging is to minimize risks and this includes using hedging to minimize losses. This guide provides an overview of hedging to aid producers in evaluating hedging opportunities.

The options market is sometimes referred to as insurance. By hedging through the options market, an individual locks in the costs of hedging and then can lose at most only the cost of the option premium while having unlimited profit potential.

### Commodity trading: The operations of a commodity exchange

Trading is the process whereby a commodity is simultaneously bought and sold in two separate markets to take advantage of a price discrepancy between the two markets. A commodity futures exchange acts as a marketplace for persons interested in trading. The factors driving trading are the real or perceived differences in the equilibrium price determined by supply and demand at various locations. For

instance, suppose there is a shortage of corn in North Carolina to feed livestock. If I believe that I can profit from buying corn in Missouri, paying shipping costs, and selling corn in North Carolina, I will continue to do so until the supply and demand for corn are equal in North Carolina. At that point, the Missouri corn price plus the shipping costs will equal the North Carolina corn price.

For the options market, the trading activities are carried out through the exchange of paper promissory notes to sell or buy a commodity at an agreed upon price at a later date. A promissory note gives an individual the right to either buy or sell at a later date; it carries no obligation to buy or sell as with futures hedging. As new information enters the market (exchange), perceptions change and the process of arbitraging begins again. Options change in value as perceptions change, indicating to traders where the market will go in the future.

### Where does trading occur?

There are two main locations where trading occurs for agricultural commodities. Chicago is the location of both of these main futures exchanges. The Chicago Board of Trade (CBOT) is where corn, soybean, soybean oil, soybean meal, wheat and rough rice futures are traded. The Chicago Mercantile Exchange (CME) is where futures in lean hogs, live cattle, feeder cattle and stocker cattle are traded. In addition, cotton futures are traded at the New York Cotton Exchange (NYCE).

### Options terminology

The options market includes some specialized terminology. A put option gives an individual the right to sell a futures contract at a later date. A call option gives an individual the right to buy a futures contract at a later date. The price at which the futures market can be entered at a later date is referred to as the strike price. The premium paid is in relation to the strike price. The strike price is a predetermined range of values that is different for each commodity. A put option is said to be

*in the money* if the strike price is above the underlying futures price. Conversely, a call option is *in the money* if the strike price is below the future price. Both put and call options are said to be *at the money* if the strike price is equal to the underlying futures price. A put (call) option is said to *out of the money* if the strike price is below (above) the underlying futures price. At any given time, the range of strike prices quoted will cover values in the money, at the money, and out of the money. Thus, a hedger or speculator has the option of purchasing an option at any of these three levels. Typically, options in the money will have the highest premium, followed by options at the money. Options out of the money will have the lowest premiums.

The value of the option has two components: intrinsic and time value. Both of these values are implicit values, not observed but theoretically present. Intrinsic value is the value of the option relative to the underlying futures price. That is, a \$76/cwt put option for feeder cattle has an intrinsic value of \$2.50/cwt if the underlying futures price is \$73.50/cwt. This is because the put option could be exercised (sell a futures contract at \$76/cwt and buy back at \$73.50/cwt). Typically, the change in intrinsic value of the option is determined by the change in futures price. However, the change in option price is typically not as large for options out of the money or at the money. Additionally, there is a time component to the value of an option. The time value reflects the time between the option premium quote and contract expiration. Typically, the larger the time period the greater the time value of the option. That is, the greater number of days until contract expiration, the higher the probability of the futures market changing in value enough to improve the intrinsic value of the option.

## Example

Bill believes the domestic fall production of corn has been underestimated in midsummer, and Tom believes the domestic fall production of corn has been overestimated in midsummer. Using the commodity exchange as a marketplace, Bill purchases the right to sell a futures contract (put), at a predetermined strike price, at a later date because he believes corn prices are destined to go lower. Tom purchases the right to buy a futures contract

(call), at a predetermined strike price, at a later date because he believes the price is going to go higher. In contrast to the futures market, Bill and Tom's positions do not offset each other. In the options market, writers of options are like an insurance agency. Writers of options are willing to take a set premium per unit of commodity in exchange for the risk that the commodity price may move against them.

Suppose Bill purchases the right to sell (put option) a future contract for corn at a later date at a strike price of \$2.60/bushel for a premium of \$0.15/bushel, and suppose the futures price is at \$2.70/bushel that day. Then Bill would initially pay the commodity broker \$750 (5,000 bushels multiplied by \$0.15) plus commissions. The \$750 would go to the writer of the option. Anyone can write options. Why would anyone write an option? Because if the price does not decline or the price rises, the premium would decline over time and the option writer would profit \$750. However, the futures market price could have decreased to \$2.40/bushel and the premium increased to \$0.35/bushel. Note, generally there is not a one-to-one relationship between a change in the futures market price and option premium due to less risk in the options market. Thus, Bill could now either sell the option for \$0.35/bushel and profit \$0.20/bushel (\$1,000) or exercise the option. Exercising an option should be done only if there is concern about liquidity in filling an order to sell the option.

## When to hedge

By knowing his cost of production, Joe can determine the price at which he might consider forward pricing a portion of his production. Thus, it is imperative that producers know their cost of production when hedging a commodity. For instance, if Calvin knows his cost of production on 400-pound feeder calves is \$60/cwt, then Calvin might consider forward pricing a portion of his calf crop through the options market. It is important that producers determine a target profit margin, because the natural tendency is to price at the market high. It is nice to say you received \$5/cwt more on your calf crop than your neighbor, but it is even better to say you retired a farmer by making wise choices instead of risky ones.