

## DEPARTMENT OF AGRICULTURAL ECONOMICS

# Hedging With a Put Option

**Jackie Smith and Carl Anderson**  
 Professor and Extension Economist  
 Texas A&M University System

**Dean McCorkle**  
 Extension Economist, Risk Management  
 Texas A&M University System

**Dan O'Brien**  
 Extension Agricultural Economist  
 Kansas State University

Put options are a pricing tool with considerable flexibility for managing price risk. The main advantages of a put option are protection against lower prices, limited liability with no margin deposits, and the potential to benefit from higher prices. Futures contracts alone cannot provide this combination of downside price insurance and upside potential. The put provides leverage in obtaining credit, assists in production management decisions, and has a formal set of contract provisions and known procedures for settling disputes. The cost is paid at the time of purchase and basis risk remains until fixed, or the crop is sold. Each option represents a standardized quantity linked to a futures contract, and trades must go through a commodity broker.

## How the Put Option Works

A commodity put option contract gives the buyer (known also as the purchaser or holder) the right, but not the obligation, to sell a specific futures contract at a known fixed price at any time before or on a certain expiration date. In acquiring this right, the buyer pays a premium (payment) to the seller of the option. The financial obligation is limited to the option premium and brokerage fees.

Put option contracts specify the futures commodity and month, the exercise price, and the period of time for which the option is in effect. As with any market, there must be a buyer and seller. The premium is the only part of an option contract that is negotiated in the trading pit. The specific month, strike price, and expiration date are predetermined by the respective commodity exchange.

The seller (also known as the writer or grantor) receives the premium for assuming the obligation to take the specific futures contract position if the option

buyer decides to exercise the right to sell under the option contract. The put option grants the buyer of the option the right to sell (go short), while the seller has the obligation to take the opposite long position, even at a loss.

## Using Put Options for Price Protection

Buyers of put options can hedge their downside price risk for a period of time and still benefit from potential price gains if the

market should increase. Options are much like an insurance policy. The purchaser pays a premium to protect against a possible loss. Once the premium is paid, the put buyer has no further obligation.

Depending on price movements, the producer can either accept or leave the guaranteed price. That is, if the price goes higher after you buy the option, you can sell in the cash market and forget about the option. But, if the market goes down, you have the price protection with the put option at the selected strike price.

After the buyer has purchased an option from the seller, the option contract may be handled in any of three ways.

**Expire.** The buyer of a put may opt to allow the option to expire if the cash price has increased and the option value has completely eroded. In other words, do nothing if the option has no value at its expiration date. Thus, the option premium paid becomes another production expense. However, the option provided the buyer downside price risk protection or price insurance for a period of time. The seller keeps the premium.

**Offset.** The buyer may decide to make an offsetting transaction in the options market if the option has increased in value or if part of the premium can be salvaged. The offset transaction is accomplished by the buyer selling the put option on the exchange. Profit or loss depends on the current market price (premium) of

**Figure 1.** Floor price with a put.

### Futures strike price

- Put premium paid
- Local basis (may be positive)
- Brokerage fee/transaction costs

= **Floor price**

the option compared to the original price paid. The buyer can offset the option at the current market premium at any time until the expiration date.

**Exercise.** The put buyer may exercise the right under the option contract, on or before the expiration date, to take a sell (short) position on the futures market at the strike price associated with the options contract. The option buyer acquires the futures position and becomes subject to margin requirements. Producers would rarely exercise an option except under certain favorable market conditions. The option seller keeps the premium paid by the buyer. Option sellers always run the risk of being exercised upon. Please refer to *Introduction to Options*, for more information on selling options.

All futures and options contracts traded are cleared through a commodity clearing corporation that guarantees the performance of each contract. It is through margin deposits, guarantee funds and other safeguards that the commodity clearing corporation is able to guarantee performance on futures and options contracts.

Thus, every put option has a buyer and seller. Profit or loss will depend on the current market price (premium) of the option compared to the original price (premium) paid or received.

### Put Option Basics

Terms of the options contract are set by the appropriate commodity exchange. These terms include:

- Type of option (put or call)
- Underlying contract month
- Expiration date
- Exercise or strike price (usually in even increments of cents such as 1 or 2 cents per pound for cotton, 10 cents per bushel for grain, etc.)
- Other exercise and assignment terms of exchange

Each commodity exchange has specific rules governing the terms of trading that are available in contract specifications brochures. The interaction of buyers and

sellers in the marketplace determines the price or premium to be paid.

### Delivery Months

When buying put options, select the appropriate delivery month. While options have the same delivery months as the underlying futures contract, the option usually expires the month before the delivery month. For example, corn options delivery months are December, March, May, July and September. Cotton delivery months are December, March, May, July, and October.

### Strike Price

A put option is tied to a predetermined price level, in the underlying delivery month, at which the option can be exercised. This is referred to as the strike price. Strike prices are listed surrounding the futures price in designated increments such as 25 cents per bushel for soybeans, 10 cents for corn, and 1 cent per pound for cotton.

### Option Premiums

When a futures option is purchased, the premium is paid in full by the purchaser to the broker. The brokerage firm sends the money through the commodity clearing corporation to the seller (the writer). An option purchaser has no further obligation until the put option position is closed out or exercised.

Cotton option premiums are quoted in cents and hundredths of a cent per pound (one cent = 100 points). Thus, a 1-cent per pound premium amounts to a \$500 premium for a 50,000-pound cotton futures contract. A premium of 10 1/2 cents per bushel amounts to a \$525 premium for a 5,000-bushel grain contract.

The premium for an option consists of two components: 1) the intrinsic value (in-the-money value), which for a put would be the amount by which the strike price exceeds the current futures market price; and 2) the time value, which is the amount required by the seller, in excess of the intrinsic value, to compensate for the risk assumed over the life of the contract.

**Figure 2.** Example of premium values.

December cotton futures		
Futures	Put strike	Premium
\$ .74	\$ .76	\$ .04
Intrinsic value =	\$ .02 (\$.76-\$ .74)	
Time value =	\$ .02 (\$.04-\$ .02)	

The intrinsic value changes only when the price of the underlying futures contract changes. However, time value changes with both the price of the underlying contract and the passage of time.

Three factors tend to affect the value of option premiums: the volatility of the underlying futures contract; time remaining before expiration; and the strike price to market price relationship. Volatility is important because the more volatile the underlying contract, the larger the premium. Greater volatility increases the premium because buyers are willing to pay more for price risk protection, and sellers demand a larger premium for their increased risk. The more time remaining before expiration, the greater the chances are for substantial price moves. The strike price versus market price relationship can be in-the-money, at-the-money, or out-of-the money. Put options are in-the-money when the strike price exceeds the current market price of the underlying futures. A put option is out-of-the money when the strike price is below the current futures price. When the strike price equals the current market price of the underlying futures, it is at-the-money.

When the price of the underlying futures contract and time-to-expiration change, so will the premium on a put option.

*Figure 3. Example strike price vs. market price relationship.*

<b>December cotton futures currently \$.76/pound</b>	
<b>Your position</b>	<b>Strike price</b>
in-the-money	\$.78
at-the-money	\$.76
out-of-the money	\$.74

Buying a put offers price insurance for the cost of a premium based on the strike price and the selected futures contract. Options, depending on price goals, are extremely flexible.

### **Hedging Using Put Options**

#### **Advantages:**

- Reduces risk of price decline
- No margin deposit required
- Provides some leverage in obtaining credit
- Established price helps in production management decisions
- Buyers may be more accessible
- Greater flexibility in canceling commitment
- Formal procedure for settling disputes

*Figure 4. Example of buying a December put option (cents per pound)*

<b>December cotton put options</b>				
<b>December futures settlement price = 74.98</b>				
<b>Strike price cents/lb.</b>	<b>Premium cents/lb.</b>	<b>Brokerage fee cents/lb.</b>	<b>Total cost \$</b>	
76.00	3.48	0.20	1,840	
75.00	3.00	0.20	1,600	
74.00	2.45	0.20	1,325	
73.00	1.94	0.20	1,070	
72.00	1.67	0.20	935	
71.00	1.35	0.20	775	
<b>At-the-money = 75 cents</b>				
<b>December puts expire in November</b>				
<b>Options contract is for 50,000 pounds</b>				
<b>Strike price</b>	<b>Estimated basis</b>	<b>Option premium</b>	<b>Brokerage fee</b>	<b>Total Cost</b>
76.00	-7.00	-3.48	-0.20	65.32
74.00	-7.00	-2.45	-0.20	64.35
72.00	-7.00	-1.67	-0.20	63.13

The producer has a choice of selecting strike price and premium to fit desired price insurance, cash flow and income objectives.

**Disadvantages:**

- Premium payment required
- Net price not fixed and may be difficult to estimate because of local price versus future price relationship (basis variability)
- Brokerage fees charged
- Fixed quantity

**In summary, the following can be said about put options:**

- Buyers of options pay premiums in exchange for certain rights related to futures contracts.
- Sellers of options receive premiums in exchange for assuming obligations of futures contracts.

- Put options give buyers the right, but not the obligation, to sell futures contracts.
- Once purchased, options contracts are completed by:
  - 1) expiration
  - 2) exercise, or
  - 3) transfer to another purchaser (offsetting transaction in the options market)
- Put option markets are separate from call option markets.

Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

Contents of this publication may be freely reproduced for educational purposes. All other rights reserved. In each case, credit Jackie Smith, Carl Anderson, Dean McCorkle, and Dan O'Brien, *Hedging with a Put Option*, Kansas State University, November 1998.

**Kansas State University Agricultural Experiment Station and Cooperative Extension Service**

It is the policy of Kansas State University Agricultural Experiment Station and Cooperative Extension Service that all persons shall have equal opportunity and access to its educational programs, services, activities, and materials without regard to race, color, religion, national origin, sex, age or disability. Kansas State University is an equal opportunity organization. Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating, Marc A. Johnson, Director.

November 1998