

what the cash price will be when the futures price reaches the strike price. Do this by subtracting the expected basis from the strike price. This is the basis you expect will exist when you close out the position by buying the option back and selling the cash grain.

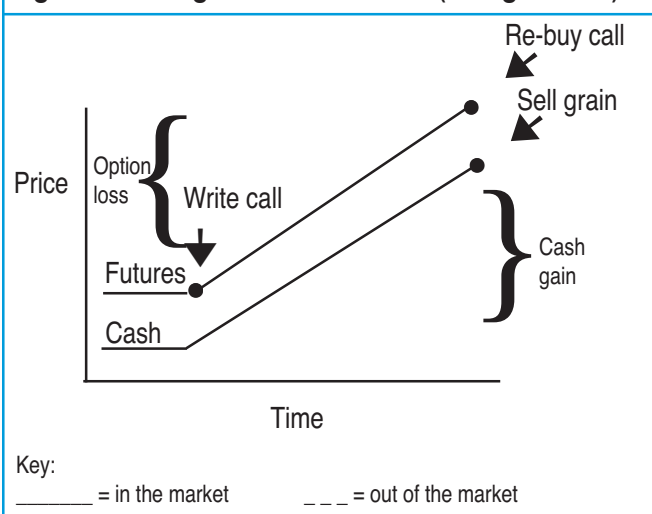
Implementation

To implement this strategy you write (sell) the call option now. Later, when you are ready to sell the grain, you buy the option back or let it expire. If the

cash grain assuming there is no time value remaining on the option premium. If the price has declined, as shown in Figure 3, the option will expire and you sell the grain at the lower price.

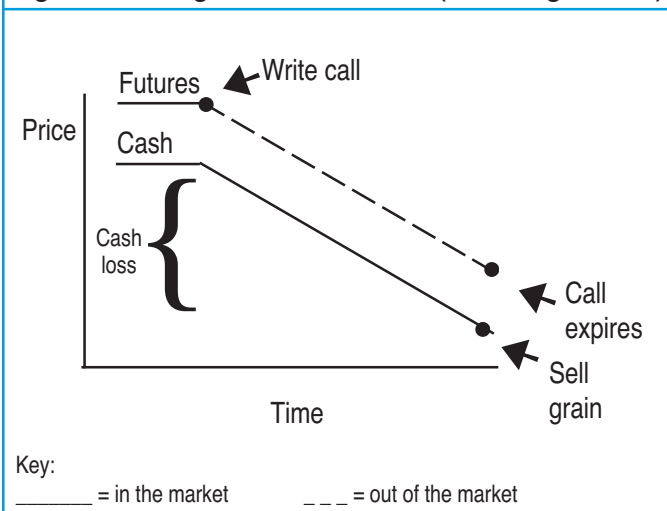
If the futures price is above the strike price, a maximum or ceiling price will be established.

Figure 2. Hold grain and write call (rising market).



price has increased above the strike price, as shown in Figure 2, you buy the option back. What you lose on the option will be offset by what you make on the

Figure 3. Hold grain and write call (declining market).



Example.

In the example below a \$7 strike price call option is purchased for a premium of 40 cents. Subsequently, the futures price increases to \$8, (\$1 above the \$7 strike price) and the cash price increases to \$7.50 (50 cent basis).

\$8.00	futures price
7.00	strike price
.40	premium
7.50	cash price

The net price is the \$7.50 cash price, less the \$1 option loss (\$7 - \$8), plus the 40 cent premium, for a total of \$6.90 (not including the trading cost).

\$7.50	cash price
- 1.00	option loss
+ .40	premium
\$6.90	net price

Next assume the futures price increases to \$9 or \$2 above the strike price. The cash price increases to \$8.50 (50 cent basis). The cash price of \$8.50, less the option loss of \$2, plus the premium of 40 cents results in a price of \$6.90.

\$8.50	cash price
- 2.00	option loss
+ .40	premium
\$6.90	net price

As shown in these examples, whenever the futures price is at or above the strike price, the ceiling price is \$6.90. However, if the basis is different than expected, the ceiling price will also change.

Example.

Assume the futures price increases to \$9.00 or \$2.00 above the strike price. The cash price is \$8.40 (60 cent basis).

The cash price of \$8.40, less the option loss of \$2.00, plus the premium of 40 cents, results in a net price of \$6.80.

\$8.40	cash price
- 2.00	option loss
+ .40	premium
\$6.80	net price

Because the basis is 10 cents wider, the cash price is 10 cents lower, resulting in a 10 cent lower ceiling price. If the basis is narrower the ceiling price will be higher.

Also, if there is time value remaining in the option premium when you buy the option back, the ceiling price will be lower.

If the futures price is below the strike price, the cash grain is sold for the lower price and the option is allowed to expire.

Example.

Assume the futures price declines to \$6 and the cash price to \$5.50 (50 cent basis.)

\$7.00	strike price
.40	premium
6.00	futures price
5.50	cash price

The cash price of \$5.50, plus the premium of 40 cents, results in a net price of \$5.90. The option expires worthless.

\$5.50	cash price
+ .40	premium
\$5.90	net price

Estimating the ceiling price

An estimate of the maximum price or ceiling price can be made in advance. It can be computed by adding the premium and subtracting the expected basis and trading cost from the strike price.

Example.

Assume the strike price is \$7, the premium is 40 cents, and the estimated basis is 50 cents (assume no trading cost.) The estimated ceiling price is \$6.90.

\$7.00	strike price
+ .40	premium
- .50	estimate basis
\$6.90	est, ceiling price

The accuracy of the ceiling price estimate will depend on how closely the estimated basis approximates the actual basis and whether the option premium has any time value remaining when you buy back your position.

Raising the ceiling

One of the complaints of using options to enhance price is the low ceiling price that it establishes on your grain. One way to increase the ceiling price is to write *out-of-the-money* call options. *Out-of-the-money* options will increase the ceiling price but will reduce the size of the premium you receive.

Example.

In the example below the futures price is \$7.00 and the basis is 30 cents.

\$7.00	futures price
.30	basis

Call strike prices ranging from \$7.00 (at-the-money) to \$7.75 (75 cents out-of-the-money) and their respective premiums are shown below.

Strike price	\$7.00	\$7.25	\$7.50	\$7.75
Premium	.40	.30	.25	.22

The maximum selling price is \$7.10 for the at-the-money option and rises to \$7.67 for the 75 cent out-of-the-money option.

Maximum price

Strike price	\$7.00	\$7.25	\$7.50	\$7.75
Expected basis	- .30	- .30	- .30	- .30
Premium	<u>+.40</u>	<u>+.30</u>	<u>+.25</u>	<u>+.22</u>
Net price	\$7.10	\$7.25	\$7.45	\$7.67

However, the net price decreases from \$6.10 for the at-the-money option to \$5.92 for the 75 cent out-of-the-money option if the futures price decreases to \$6.00.

Price decline (\$6.00 futures price)

Futures price	\$6.00	\$6.00	\$6.00	\$6.00
Expected basis	- .30	- .30	- .30	- .30
Premium	<u>+.40</u>	<u>+.30</u>	<u>+.25</u>	<u>+.22</u>
	\$6.10	\$6.00	\$5.95	\$5.92

So *out-of-the-money* options result in a higher ceiling price but a lower enhanced price if prices decline.