

Commodity Challenge

Section II: Basic Pricing Tools

Chapter 10: Selling futures to hedge the value of grain

Learning objectives

- Understand how producers can sell futures to hedge the value of grain before harvest

Key terms

Hedging: To buy or sell a futures contract on a commodity exchange as a temporary substitute for an intended later transaction in the cash market.

Short hedge: The sales of futures contracts against cash ownership, including inventory, expected production and/or forward purchases. The short hedge protects the hedger against falling prices.

Put on a hedge (place a hedge): Buying or selling futures contracts to establish a hedge position in the market.

Lift a hedge: Buying or selling futures contracts to remove a hedge position in the market.

Unwind a hedge: Making a purchase or sale in the cash market and simultaneously lifting a corresponding hedge position.

The feed buyers version of Commodity Challenge puts you in the position of a dairy or livestock producer. As such, the game emphasizes the buyer's perspective in controlling feed costs. We spent the last chapter on long hedging, or the purchase of futures to lock-in feed costs. The long hedge protects the hedger against rising prices.

However, not every participant in the grain market is concerned with higher prices. Grain producers, for example, worry about lower grain prices. This is the other side of risk management – players who need a short hedge. A short hedge involves the sales

of futures contracts against grain inventory or a crop developing in the field. The short hedge protects the hedger against falling prices.

There is a simple formula you can use to calculate the expected price from a short hedge...

$$\text{futures price (when sold)} + \text{expected basis} - \text{fees} = \text{expected price}$$

While this formula looks similar to the formula used to calculate the purchase price from a long hedge, please note a subtle difference; in a short hedge, fees are subtracted from the price received (with the long hedge, they add to the cost).

This chapter focuses on **short hedging before harvest**.

Hedging the value of grain before harvest

Initial hedge

Date	Cash	Futures	Basis
March	Planting starts soon and with December futures above \$5.00/bu., a producer has a chance to lock in a profitable price for corn at harvest.	Put on a hedge - Sell December corn futures at \$5.05	Expected harvest basis is -\$0.40 Z, or 40 cents under the December contract.

Let's use the formula to calculate the expected price at harvest. In this example, the producer sold December futures at \$5.05/bu. and expected a basis of 40 cents under (-\$0.40) at harvest. Let's do the math and ignore brokerage fees.

Expected harvest price:

$$\begin{aligned}\text{futures price} + \text{expected basis} &= \text{expected price} \\ \$5.05 + (-\$0.40) &= \$4.65/\text{bu.}\end{aligned}$$

Help this producer unwind the following hedge at harvest (i.e., sell cash corn and buy back futures) under each of the following scenarios at the time of the harvest sale. Let's calculate the producer's final price per bushel for corn (ignoring brokerage costs). In this scenario, the futures gain was \$0.21 (\$5.05 sale - \$4.84 purchase).

Scenario #1

Cash price at harvest: \$4.48 per bushel

December futures price at harvest: \$4.84 per bushel

Harvest basis: (-\$0.36)

We have two ways to calculate the final price. We can take the cash price when corn is sold at harvest, and add the gain or loss in the futures market.

$$\$4.48 \text{ (cash sale at harvest)} + \$0.21 \text{ (futures gain)} = \$4.69$$

Or we can think like a hedger and look at the original futures sale and adjust for the actual basis at harvest.

$$\$5.05 \text{ (original futures sale)} + (-\$0.36) \text{ harvest basis} = \$4.69$$

Why was my final price of \$4.69 per bushel four cents better than expected (\$4.65)? Because the basis at -\$0.36 per bushel was four cents stronger than expected (-\$0.40).

Scenario #2

Cash price at harvest: \$5.54 per bushel

December futures price at harvest: \$5.80 per bushel

Harvest basis: (-\$0.26)

Again, we have two ways to calculate the final price. We can take the cash price when corn is sold at harvest, and add the gain or loss in the futures market. In this scenario, the futures loss was \$0.75 (\$5.05 sale - \$5.80 purchase).

$$\$5.54 \text{ (cash sale at harvest)} - \$0.75 \text{ (futures loss)} = \$4.79$$

Or think like a hedger and look at the original futures sale and adjust for the actual basis at harvest.

$$\$5.05 \text{ (original futures sale)} + (-\$0.26) \text{ harvest basis} = \$4.79$$

Why was my final price of \$4.79 per bushel fourteen cents better than expected (\$4.65)? Because the basis at -\$0.26 per bushel was fourteen cents stronger than expected (-\$0.40).

Scenario #3

Harvest basis: (-\$0.42)

To calculate your final price here you must think like a hedger.

$$\$5.05 \text{ (original futures sale)} + (-\$0.42) \text{ harvest basis} = \$4.63$$

Why was my final price of \$4.63 per bushel two cents less than expected (\$4.65)? Because the basis at -\$0.42 per bushel was two cents weaker than expected (-\$0.40).

Further readings and resources from the CME Group

- Learn about the futures and options markets:
<https://www.cmegroup.com/education/courses.html#filters=futures,agriculture>
- Introduction to Grains and Oilseeds:
<https://www.cmegroup.com/education/courses/introduction-to-grains-and-oilseeds.html>
- Hedging with Grain and Oilseed Futures and Options:
<https://www.cmegroup.com/education/courses/hedging-with-grain-and-oilseed-futures-and-options.html>

Exercise #10: Hedging soybeans before harvest

In April, you decide to sell November soybean futures contracts at \$12.10 per bushel to lock in a price for soybeans to be delivered at harvest. Your expected basis at harvest is 65 cents under the November contract (-\$0.65 per bushel).

Use the following formula to calculate your expected price at harvest (ignore brokerage costs).

$$\text{futures price (when sold)} + \text{expected basis} = \text{expected price}$$

This is your expected price, based on your expected basis. Now complete the transaction at harvest under three different price scenarios: higher futures prices, lower futures prices and steady futures prices. Again, ignore brokerage costs.

Scenario #1: Higher futures prices

Cash price at harvest: \$12.35 per bushel

November futures price at harvest: \$13.10 per bushel

Harvest basis: (-\$0.75)

Scenario #2: Lower futures prices

Cash price at harvest: \$9.75 per bushel

December futures price at harvest: \$10.30 per bushel

Harvest basis: (-\$0.55)

Scenario #3: Steady futures prices

Cash price at harvest: \$11.62 per bushel

December futures price at harvest: \$12.10 per bushel

Harvest basis: (-\$0.48)