

Econ 337 Agricultural Marketing, Spring 2018

In Class Activity 6, April 24, 2018

1. The soybean crush seeks to hedge the complex of market positions arising from the soybean crush operation, i.e., buy soybeans, then sell soybean meal and oil. In futures markets, if the prices are wrong (arbitrage), then buy soybean futures and sell meal and oil futures. Even if prices are right, use as a hedge on crushing activities.

Crush Rule: If VMO (value of meal and oil) is greater than the SP (soybean price) + CC (crush costs), then buy soybean futures and sell soybean meal and oil futures.

Crush Yield: 60-pound bushel of soybeans yield 48 pounds of meal, 11 pounds of oil, and 1 pound of waste. Crush yield varies with the quantity of soybeans. Many processors yield only 44 pounds of 49% protein meal, but the 48-11-1 ratio is a standard that is used here to illustrate the crush hedge.

November soybean futures trading at \$7.30 per bushel
November meal futures trading at \$200 per ton or \$0.10 per pound
November oil futures trading at \$0.25 per pound

Cost of Crush = \$0.20 per bushel

- a. What is the value of soybean meal and oil in \$ per bushel?

- b. What transactions would you take in the futures market for a crush hedge? At what prices?

- c. November soybean futures increase \$0.02 per bushel and November soybean meal and oil futures decrease \$0.03 per bushel. What transactions would you take in the futures market to lift the crush hedge? At what prices?

d. Assuming no brokerage commission, what is the net hedge addition to the crush margin?

e. Why did the crush hedge work, i.e., why did futures prices change in the way in which they did?

2. If futures prices of soybean meal and oil, appropriately weighted for crush yield is too low relative to futures price of soybean beans + cost of crushing, then consider a reverse crush, i.e., sell soybean futures and buy soybean meal and oil futures with same maturity.

Reverse Crush Rule: If VMO (value of meal and oil) is less than than the SP (soybean price) + CC (crush costs), then put on a reverse crush as sell soybean futures and buy soybean meal and oil futures.

Value of March soybean meal and oil = \$7.20 per bushel

March soybean futures = \$7.10 per bushel

Cost of Crush = \$0.20 per bushel

a. What transactions would you take in the futures market for a reverse crush hedge? At what prices?

b. March soybean futures decrease \$0.02 per bushel and March soybean meal and oil futures increase \$0.08 per bushel. What transactions would you take in the futures market to lift the reverse crush hedge? At what prices?

c. Assuming no brokerage commission, what is the net hedge addition to the reverse crush margin?

d. Why did the reverse crush hedge work, i.e., why did futures prices change in the way in which they did?

3. Assume a processor puts on the following crush hedge:

Leg A: Buy November soybean futures a \$7.30 per bushel

Leg B: Sell November soybean meal and oil futures at \$7.55 per bushel

And the cost of crush = \$0.20 per bushel

a. If the markets don't go back to normal, i.e., \$0.20 per bushel futures crush margin, and soybean futures prices stay at \$7.30 per bushel and soybean meal and oil futures stay at \$7.55 per bushel, what can the processor do in November to benefit from the larger than normal futures crush margin?

b. What is the net crush margin?

4. Assume a processor puts on the following reverse crush hedge:

Leg A: Sell March soybean futures a \$7.10 per bushel

Leg B: Buy March soybean meal and oil futures at \$7.20 per bushel

And the cost of crush = \$0.20 per bushel

a. If the markets don't go back to normal, i.e., \$0.20 per bushel futures reverse crush margin, and soybean futures prices stay at \$7.10 per bushel and soybean meal and oil futures stay at \$7.20 per bushel, would the delivery process assure the processor and increase in the crush margin?