

13.0 Commodity Crop Marketing as a Tactical Tool

13.1 Introduction

Commodity marketing is a set of tactical management alternatives focusing on price risk management. Commodity marketing's sole function is to reach broader business goals set in the SRM process and falls under the tactical portion of the ten step plan.

EWS Farms specializes in grain production, and the Farms' managers believe risk management improvements can be made in grain marketing. Grains fit the definition of a commodity because it's difficult to differentiate grain from one farm to the next.

Moreover, commodity producers can't set grain prices– if they tried, competitors would offer a lower price. Instead, prices arise from a process of balancing this year's harvest and carryover stocks against buyers' grain demands.

But does every commodity producer receive the same price? No, that's not true. Crop sales can be timed so that the price received from a forward contract is quite different than the price received at harvest, which is quite different from the price received if the crop is stored and marketed the following year. If only we knew when the market's high price would be – the entire crop would be sold that day!

In truth, no one knows when the market high will occur. But, we can use the time varying nature of prices to avoid making pricing mistakes and take advantage of what the commodity market can give. A word of caution, the goal of this chapter is not to teach

you how to beat the market. Rather, we'll introduce concepts that will help you to avoid marketing mistakes and generate returns that are reasonable given existing economic conditions. Before that discussion, let's consider the payoff for improving marketing skills.

13.2 EWS Farms: The Payoff for Improving Marketing Skills

The EWS Farms marketing strategy is straightforward: sell grain at harvest. Over fifteen years, the farm has received an average harvest price of \$2.19 per bushel for their corn grain and \$2.97 per bushel for their wheat. Figure 13.1 and 13.2 show a histogram of historical corn and wheat harvest prices in NE Colorado. Between 1970 and 2000, cash corn prices have ranged from a low of \$1.14 per bushel to a high of \$3.35 per bushel (Figure 13.1) Wheat prices also have a wide range, from \$1.20 to \$4.78 per bushel (Figure 13.2). It's clear from the figures that local cash grain prices can vary a great deal over time. Price risk is a real concern.

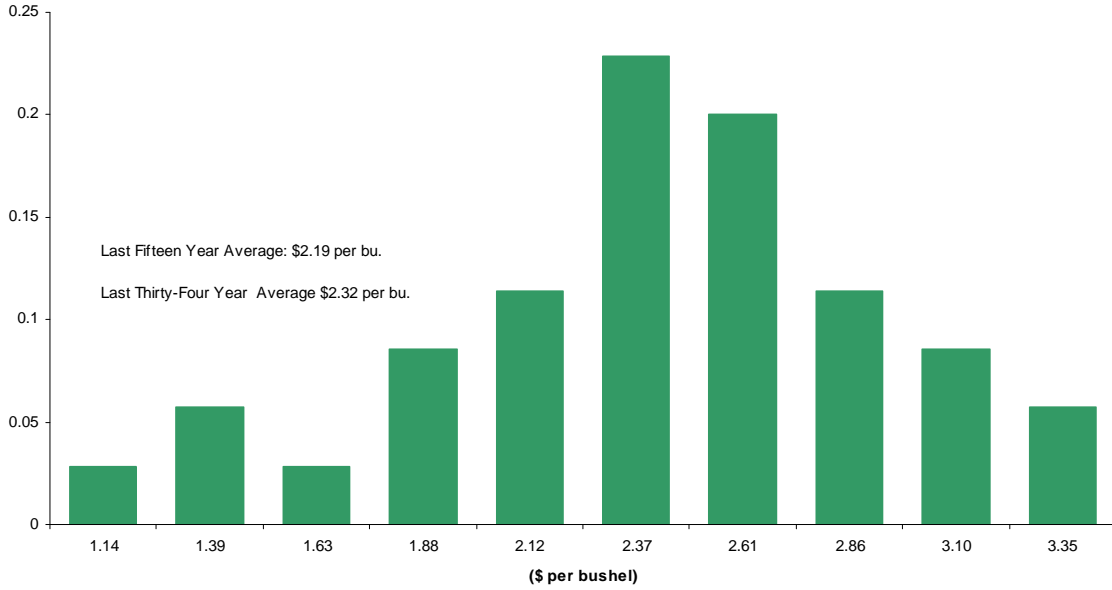


Figure 13.1 Harvest Cash Corn Price Histogram for EWS Farms (1970 to 2005)

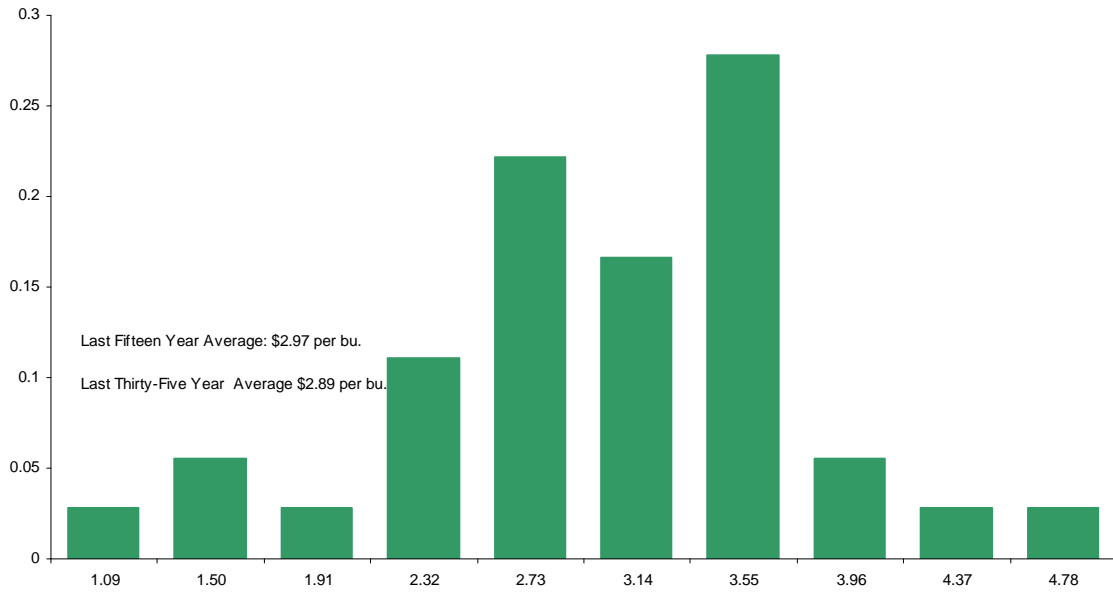


Figure 13.2 Harvest Cash Wheat Price Histogram for EWS Farms (1970 to 2005)

13.2.1 EWS Farms' Gross Revenues and Net Income

Let's see how a price improvement can alter the bottom line for EWS Farms. EWS Farms' gross revenues are \$315,615 assuming a fifteen-year average for the price and yield (shown in the second column of Table 13.1). In the next column of the table, prices have been increased by 5%, and gross revenues recalculated to be \$331,396. Not surprisingly, the price increase leads to 5% higher gross revenues as is written in the last column. Perhaps more surprising is the increase in net income found in the next row. With average prices and yields, the Farms' net income is \$41,702. After the 5% increase, net income grows by 37.8%!

Why does net income increase dramatically when gross revenues increase but 5%? Improving prices does increase revenues but not costs. Increasing net income improves key efficiency ratios such as the asset turn over ratio and the rate of return on assets (last two rows of Table 13.1). Clearly, avoiding pricing mistakes can have a big impact on a farm's bottom line.

Table 13.1 Financial Measures with Average and Improved Prices

Financial Measure	With Average Prices	With Price Improvement	Percent Difference
Gross Revenue (\$)	\$ 315,615	\$ 331,396	5.0%
Net Income (\$)	\$ 41,702	\$ 57,483	37.8%
Asset Turnover Ratio	20.3%	21.3%	1.02%
Rate of Return to Assets	2.5%	3.6%	1.02%

13.2.2 The Catch: Market Risk and its Impact on Revenues.

Improved marketing skills boost the bottom line on average, but price risk remains. EWS Farms faces significant variability in prices from year to year, so stabilizing revenues by avoiding low prices isn't as easy as it seems. Before we address the tools for reducing price variability, it's worthwhile to understand how much revenue variability is naturally reduced because prices and yields tend to move in opposite directions. The strength of this natural reduction influences the tools chosen to manage risk.

13.2.3 The Natural Hedge

EWS Farms faces yield and price variability as is illustrated in Figure 13.3, which charts yields (as bars) and cash prices (as a line) for irrigated corn. Notice that most of the time, but not always, high yields are associated with low cash prices (1994 is a good example of this), and when the cash price of corn is high the yields tend to be low, as was true in 1995. Because prices and yields are negatively correlated with one another, cash revenues tend to be less volatile than either. The “smoothing” of revenues is called the “natural hedge.”

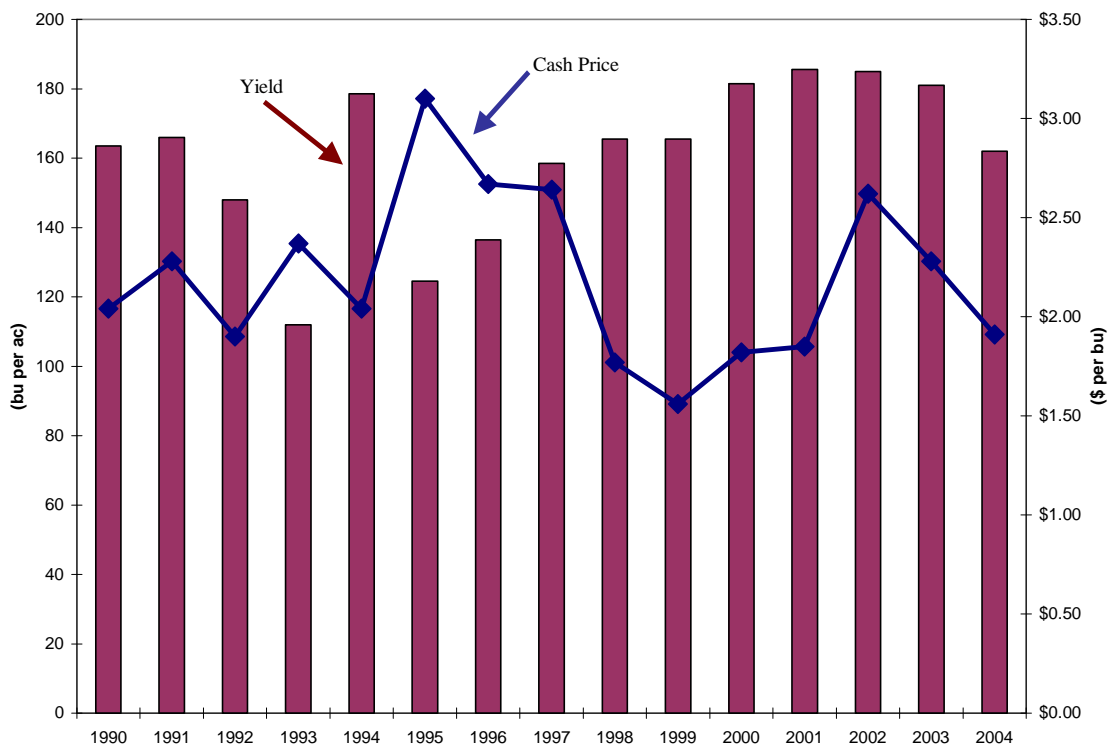


Figure 13.3 EWS Farms' Corn Prices and Irrigated Yields

The correlations between EWS Farm's yields and the local price are -0.47 for irrigated corn; dryland corn is -0.43 , and dryland wheat is -0.28 . A stronger negative correlation between price and yields means that the natural hedge works better to smooth revenues.

The strength of the natural hedge varies with geography. In a place like the Corn Belt, farm level yields are highly correlated with national yields, and therefore these yields have a strong negative correlation with a national price. A strong negative correlation means the natural hedge is quite strong, and Corn Belt farms face less revenue variability than other locations. EWS Farms is outside the Corn Belt and faces more natural revenue

variability because local yields aren't as correlated with national yields and, therefore, less negatively correlated with the national price.

The strength of the natural hedge also varies by crop. While the domestic corn crop largely determines its prices, US wheat prices are closely tied to international supply and demand. Because US production is a small share of the worldwide crop, the natural hedge is weaker making wheat income more variable than corn income (Harwood et al.).

The strength of the natural hedge will influence how well risk management tools stabilize revenues. All things being equal, the weaker the natural hedge, the more likely risk management tools will reduce revenue volatility. For EWS Farms, price risk management may benefit wheat relative to corn, but the choice of a specific crop's risk management tool will also depend on the tool's cost.

In sum, this section focuses on the payoff to improved marketing skills and the natural protection that markets can give. Profitability improves with better marketing skills, but variability in revenues will still exist. Revenue variability isn't as dramatic as price variability because of the natural hedge. The stronger the natural hedge, the less effective risk management techniques will be at reducing volatility. The remainder of the chapter focuses on price risk and price risk management tools. But, as has been discussed in Chapter 10, eliminating risk is not without cost. A risk-return tradeoff exists, so that as revenue (or price) volatility is reduced, then so too is the expected return. Farm managers should consider if the reduction of revenue (price) volatility is sufficiently better than the

natural hedge. For this reason, price risk management strategies will always be compared against a benchmark, a cash sale at harvest.

13.3 Price Risk Management

Price risk can be divided into three categories: the risk derived from worldwide supply and demand conditions (futures price risk), the risk that local factors might create cash price volatility (basis risk), or the risk that, over time, prices might not compensate a producer for storing a commodity (spread price risk). The first two categories are linked by a simple pricing equation:

$$(13.1) \text{ Local Cash Price} = \text{Futures Price} + \text{Local Basis},$$

That is, the cash price received by farmers is the sum of the futures price and the local basis.

Futures prices fluctuate according to changing worldwide supply and demand conditions, while local basis varies with transportation costs, the availability of storage, and local supply/demand conditions. In this chapter, we'll consider marketing alternatives that reduce the volatility of the local cash price by fixing the futures price, the local basis, or both.

Spreads are a third category of price risk, where the commodity's spread is the difference between two futures contracts prices, quoted on the same day, but each of the contracts have different expiration dates. Several tools can be used to manage spread risk, including the storage hedge, but these have been omitted from this chapter in lieu of the references found at the end of the text.

13.3.1 Futures Prices and Contracts

Futures prices are linked closely to the local cash price for grain; cash market buyers of grain determine their offer price using a publicly reported futures price, and then make adjustments (called the basis) according to their local conditions, such as transportation and storage costs. The futures contract price is quoted from a commodity exchange, an organized market in which futures contracts are traded. A futures contract is a commitment to make or to take delivery of:

- A specific grade of commodity
- A specific quantity of that commodity
- At a designated future time
- At a designated place

The commodity exchange (e.g. the Chicago Board of Trade) establishes the contract and its specification. The exchange is an organized market for traders who seek to buy or sell futures contracts.

13.3.1.1 Who uses futures markets?

Futures contracts are traded by a variety of professionals. Speculators buy and sell contracts because they seek profits from trades. These traders seek to “buy low and sell high,” and carefully watch for evidence of world supply and demand changes.

Speculators are willing to take price risk in order to profit, and their trades mean that they are a ready buyer for any seller in the market. Speculators’ bid prices reflect their market information meaning they are a good indicator of underlying supply and demand conditions on any given day. In this way, futures prices are closely tied to the actual, worldwide cash prices for commodity grains.

Hedgers are a second group of commodity futures traders, and this group includes farmers, grain elevator managers, livestock feeders and processors. The goal of hedgers is to shift the risk of adverse price changes to the market. For instance, EWS Farms may seek to hedge part of its soon-to-be- planted corn crop. For the farm, prices that decline throughout the growing season are a particular concern. In order to hedge against this risk, they will create a futures market position that will be profitable if prices fall. That is, the farm will establish a ‘short’ market position so that they can ‘sell high, buy low’ if prices fall. In this way, EWS Farms will profit in the futures market while prices are falling in the cash corn market. (An illustrative example is found in the next section). Likewise, feedlot managers are wary of increasing prices that drive up their cost of production. These managers adopt long market positions, so that profits in the futures

market from a price increase offset lost profits because the price of cash corn, and as a result their feed costs, have increased.

To sum up, the commodity exchange, its futures contracts, and the futures prices that result from trades are all part of an important economic process. The prices themselves reflect information about worldwide supply and demand conditions. Traders observe new market information, evaluate its importance, and incorporate their subjective opinions into bid prices. As a result, futures contract prices represent a consensus opinion about how important economic shocks are. And as is discussed in the next section, futures contracts are useful for shifting risk from producers to speculators because of the economic tie between the futures contract and the grain commodity on which it is written.

13.4 Hedging Price Risk with Futures Contracts

Hedging is a risk management practice that is used to transfer cash market price risk from a commodity grain producer to the futures market. The idea behind hedging is that the grower establishes a futures market position that profits when cash market prices are declining. Hedging in the futures market is successful because futures contract prices are closely tied to local cash prices. Hedging effectiveness depends on how tightly correlated futures prices are with cash prices during the hedging period.

13.4.1 EWS Farms: Establishing a Price for a Growing Crop

As an example, expected profits for EWS Farms decrease if corn prices fall between planting and harvest. To avoid losses the farm manager might establish a desirable price for the growing crop. A price is established by:

Step 1. In the Spring, the farmer sells a new crop futures contract whose expiration date is after harvest. The futures market position (sell or short) initiated in the Spring is exactly the same action that the farmer will perform with the cash crop at harvest, many months from now.

Step 2. At harvest (or when the farmer is ready to sell the cash crop), the hedge is lifted when:

- a. The cash grain is sold to a buyer,
- b. and a futures contract is purchased to offset the futures commitment.
- c. The net price received for the grain is the cash price paid for grain at the elevator plus or minus the gain or loss from the futures contract.

13.4.2 Hedging and a Price Decrease

Figure 13.4 is a T-account, which is a useful way to illustrate what occurs in the cash and futures markets while a short hedge is in place. The T-account summarizes the action taken in each market, and the time at which the transaction occurs.

	Cash	Futures	Basis
May 20	Expect cash value to be \$2.50/bu	Sell 5,000 bu of Dec Corn futures @ \$2.70	Expect basis to be 20 cents under futures
Oct 20	Sell corn at elevator for \$2.00/bu	Buy back Dec futures @ \$2.20/bu	Basis is 20 cents under futures
Summary	Sold cash @ \$2.00	Gain in futures +\$.50	

Begin Here

Net Price Received = \$2.50/bu
 (before any futures commission or hedging costs)

They reached their goal of pricing 5,000 bu of corn at \$2.50/bu. The decline in the cash price was exactly offset by a decline in futures

Figure 13.4 EWS Farms T-Account for Establishing Price

The columns of the T- account are divided into three pricing components, local cash market (cash), the futures market (futures) and the basis. The rows of the T-account are points in time. The T-account begins in the row marked May 20th, which is the time that EWS Farms would like to establish a price for the growing crop. As is written in the far right column of this row, the EWS managers expect the harvest basis (in October) to be 20 cents under the December corn futures prices. The Farms’ basis expectation is derived from historical records of the local basis, but the basis at harvest time might be different,

which is why it is written as an expectation. On May 20th, December corn futures prices are trading at \$2.70 a bushel, and this is written in the column marked Futures. Given this futures price, the expected cash price is \$2.50 per bushel (\$2.70 futures price plus (-) \$0.20 expected basis), which is noted in the column marked Cash.

In order to initiate the hedge, the manager of EWS Farms sells a December futures contract at \$2.70 per bushel as is written in the Futures column. If prices fall between May 20th and the day on which the hedge is lifted, the futures position will be profitable. These futures profits will offset any losses in the cash market. Note that the “sell” action in the futures market on May 20th is the exact action the manager will take in the cash market at harvest.

At harvest (October 20th), the manager sells corn in the local cash market for \$2.00 bushel, 50 cents below what was expected on May 20th. December corn futures contracts are trading at \$2.20 per bushel on that day, and the manager buys a December futures contract to offset his futures market position. The difference between the cash market and the futures market is the basis, which is 20 cents under as anticipated.

The last row of the T-account summarizes the hedging action by market and will be used to calculate the net price received. Corn was sold in the cash market for \$2.00 per bushel. The futures market position garnered 50 cents profit per bushel because the selling price (\$2.70) is 50 cents greater than the buying price (\$2.20). The net price received is the local cash grain price plus the gain in the futures market, $\$2.00 + \$0.50 = \$2.50$ per

bushel. The net price received is exactly what was anticipated on May 20th – the manager was able to meet the pricing goal because the decline in the cash price was exactly offset by profits generated from a declining futures price.

13.4.2 Hedging and a Price Increase

The manager is satisfied with the short hedge because it protected the farm against downward price movements in the cash market, but what if prices had increased? Figure 13.5 examines hedge performance when prices increase from May 20th to October 20th.

The May 20th row of the T-Account is the same as the previous example: December futures contracts are selling at \$2.70 per bushel, the expected basis is 20 cents under the December futures contract and the expected cash price at harvest is \$2.50 per bushel. The manager initiates the hedge by selling a futures contract (5,000 bushels) at the prevailing price.

	Cash	Futures	Basis
May 20	Expect cash value to be \$2.50/bu	Sell 5,000 bu of Dec Corn futures @ \$2.70	Expect basis to be 20 cents under futures
Oct 20	Sell corn at elevator for \$3.20/bu	Buy back Dec futures @ \$3.40/bu	Basis is 20 cents under futures
Summary	Sold cash @ \$3.20	Loss in futures -\$0.70	

Net Price Received = \$2.50/bu
(before any futures commission or hedging costs)

They reached their goal of pricing 5,000 bu of corn at \$2.50/bu. The increase in the cash price was exactly offset by an increase in futures

Figure 13.5 Pre-harvest Pricing and Increasing Prices

Between May 20th and October 20th prices increase, perhaps because of drought in the Corn Belt. The potential supply reduction means that the December futures prices have increased from \$2.70 per bushel (the May 20th price) to \$3.40 per bushel. The basis is 20 cents under the futures contract, so the local cash price is \$3.20 per bushel. As shown in the last row of the T-account, this is the cash price that the producer receives.

Even though cash market prices increased, the futures market position lost money. A contract sold at \$2.70 per bushel and another bought qt \$3.40 per bushel to offset the position. The loss is 70 cents per bushel as is written in the last row of the T-account. The net price received is the sum of the cash market price and the loss in the futures market, or \$2.50 per bushel.

The \$2.50 per bushel is familiar; it's the expected cash value for May 20th. Just as in the case of a price decrease, the established price of \$2.50 is realized when prices increase. In this sense, the expected price of \$2.50 per bushel is "locked-in." The manager of EWS Farms has transferred price volatility to the futures market by establishing a price of \$2.50 per bushel, but at the same time the transfer has eliminated the opportunity to profit from upward price movements. The establishment of a pre-harvest price, but loss of upside potential, is an example of the risk-return tradeoff.

13.4.3 Hedging and Basis Risk

The manager has established the price on the futures market, but the local basis has not been fixed. In fact, basis is not known until the grain is marketed, and it may change from what was expected. A changing basis can make a hedge more or less effective, and for this reason a hedger is a basis speculator. Figure 13.6 is an example of a basis speculation.

The T-account in Figure 13.6 begins with an expected cash price \$2.50 per bushel and a basis of 20 cents under the December futures price. The same action is taken, on May 20th a December corn futures contract is sold at \$2.70 per bushel. Between May 20th and October 20th, the futures price has fallen to \$2.20 per bushel. However, during the same period the basis strengthened from an expected 20 cents under to 12 cents under the December futures contract. The result is an October 20th cash price of \$2.08 per bushel.

	Cash	Futures	Basis
May 20	Expect cash value to be \$2.50/bu	Sell 5,000 bu of Dec Corn futures @ \$2.70	Expect basis to be 20 cents under futures
Oct 20	Sell corn at elevator for \$2.08/bu	Buy back Dec futures @ \$2.20/bu	<u>Basis is 12 cents under futures</u>
Summary	Sold cash @ \$2.08	Gain in futures +\$.50	

What's Different ?

Net Price Received = \$2.58/bu
(before any futures commission or hedging costs)

They exceed their goal of pricing 5,000 bu of corn at \$2.50/bu, and net \$2.58 WHY? Because on Oct 20, the cash price was 12 under rather than the expected 20 under

Figure 13.6 Pre-harvest Pricing and Basis Risk

The summary of Figure 13.6 illustrates the impact of a changing basis. The cash price received for grain is \$2.08 per bushel, and the profit from the futures position is 50 cents per bushel. The net price received is \$2.58 cents a bushel – 8 cents higher that was expected!

In this case, a stronger basis (from 20 cents under to 12 cents under) worked to the advantage of EWS Farms, as it improved the net price received. The important point is that a short hedge will establish a price for a growing crop, but the basis (and hence the local cash price) will still fluctuate. In this sense, a farm producer with this type of hedge

is a basis speculator. Basis is generally much less volatile than futures prices. And as is discussed in the Additional Marketing Tools: Cash Contracts section, local marketing alternatives exist to fix the futures price of a commodity, the basis, or both.

To recap, a stronger basis makes the short hedge more effective but a weaker (wider) basis makes the hedge less effective. For long hedges (i.e. a feedlot whose long hedge protects against higher prices for feed ration grains) a weaker basis makes the hedge more effective, while a stronger basis makes the hedge less effective.

13.5 Back to the Futures: Options on Futures Contracts

Hedges can be initiated with options on futures contracts too. In contrast to the hedge in the previous example, options allow the hedger to capture gains from increasing prices, and option buyers need not post margin to initiate a hedge. However, options traders do pay a premium, up front, to hold the option. In this way options hedges are very much like crop insurance. The option holder pays a premium, up front, and then may or may not choose to exercise price insurance based on market conditions. Futures hedgers do not pay a premium.

The world of commodity futures options can be very complex; but we will focus on two simple option hedges that might be used by farmers to protect against falling prices. The two option hedging strategies that we will consider are the short hedge with put options, and the fence strategy (out- of- the- money put option combined with a long call).

13.5.1 Option Characteristics

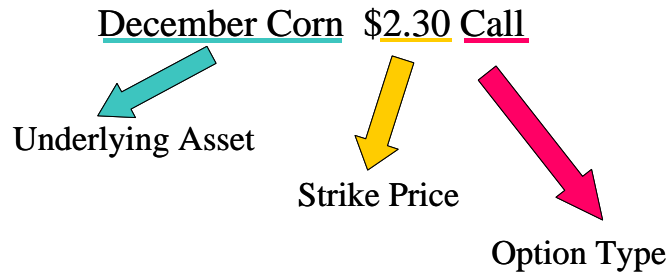
To begin, let's briefly focus on option characteristics and jargon. First, an option is the right, but not the obligation, to buy or sell a futures contract at a predetermined price or anytime within a specified period. Options are derivative instruments because the option is written on an underlying asset – in this case a futures contract.

In general, two types of options are available: a call option is the right to buy the underlying futures contract at a predetermined price prior to expiration, while a put option is the right to sell an underlying futures price prior to expiration. Put options are most frequently chosen by hedging producers to protect against falling prices, and we'll examine a short hedge using put options a little later.

The predetermined price at which an underlying futures contract may be bought or sold is called the strike or exercise price. The strike prices for options are set in predetermined multiples (e.g. 10 cents per bushel for corn) by the commodity exchange. When an option is first listed, a strike price is set near the price at which the underlying futures price is currently trading, and then a predetermined number of strike prices are set above and below this strike price. Additional strike prices are added as futures prices trade up or down their initial level.

Figure 13.7 is an example of an option for a corn futures contract. The underlying asset is the December corn futures contract, the strike price is \$2.30 per bushel and the option

type is a call. Thus, the buyer (or holder) of this option has the right, but not the obligation, to sell a December corn futures contract at \$2.30 per bushel, even if the futures contract is currently trading at a different price.



Strike Price (cents per but)	Call Premium (cents per bu)	Put Premium (cents per bu)
190	20 ³ / ₄	8
200	13 ³ / ₄	11
210	8 ³ / ₄	14
220	5 ¹ / ₂	19
230	3 ¹ / ₄	21
240	2	31 ¹ / ₂

Futures price is 216 ³/₄ cents per bushel.

Figure 13.7 Option and Option Premium Example for Corn Futures

The lower portion of Figure 13.7 lists call and put option premiums for the same December corn futures contract. Currently, the December corn futures price is trading at 216 ³/₄ cents per bushel. Both put and call options have been established at 10 cent strike price intervals ranging from 190 cents per bushel to 240 cents per bushel. The premiums for call options are listed in the second column, while the premiums for put options are listed in the last column.

Notice that the premiums for call options tend to decrease with increasing strike prices -- the premium for a 190 cent call option is greater than that of a 220 cent call option. Why is that? A call option is profitable if the underlying futures price is greater than the strike price. For the 190 cent call option, the holder of the option has the right, but not the obligation, to purchase a futures contract at 190 cents per bushel. If exercised today, the option holder can buy the futures contract at 190 cents per bushel, and then sell the contract at the existing market price of 216 $\frac{3}{4}$ cents per bushel. Exercising the option is profitable because the holder can buy low (at 190 cents per bushel) and sell high (at 216 $\frac{3}{4}$ cents per bushel). Options that are profitable to exercise are said to be in-the-money. An option is out-of-the-money if it is not profitable to exercise, and an option is at-the-money if its strike price is approximately the same as the underlying futures price. Put options are in-the-money if the underlying futures contract price is trading at a level less than the strike price. (sell high, buy low).

The holder of an option may do any of the following prior to expiration:

- exercise the option,
- offset the position (buy a put option to offset writing (selling) a put)
- or allow the option to expire.

The commodity exchange makes sure that for every option holder there is an option writer (seller). The option writer receives a premium from the option buyer, and is obligated to take the opposite position if the option is exercised. As a result, option

writers must post margin. Option buyers do not have to post margin because they can always allow the option to expire if market conditions are not favorable. In contrast, option writers do post margin because they must take an unfavorable futures market position when the option is exercised.

Option premiums are determined in an open outcry auction. Consequently, option premiums change daily with new market information. Because traders adjust their premium bids in a competitive market setting, economists are able to forecast a probability density function for the price of futures contracts at expiration (or more traditionally stock prices) from option premiums.

When an option is in-the-money, it is said to have intrinsic value. The greater the option's intrinsic value, the greater its premium. So, intrinsic value is one part of the option premium. But even options that are out-of-the-money may have value to traders. These traders have some inkling that the option may be in-the-money before the expiration date, and are willing to pay a premium based on this likelihood. This value is called the option's time value, and is also a component of the option premium. Thus, the premium of an option is:

$$(13.3) \text{ Option Premium} = \text{Intrinsic Value} + \text{Time Value.}$$

Options that are in-the-money have time value, after all, prior to expiration they may go even deeper in-the-money.

Option premiums are great indicators of market volatility – as markets become more volatile, options are more likely to become in-the-money prior to expiration, so they have a greater time value. The greater the time value, the greater the option premium will be. So, if an option hedge is used as price insurance, it will become more expensive as market volatility increases (the premium will go up). Likewise, the greater the protection level desired by the trader, the greater the cost. Increased price protection involves choosing options whose strike prices are close to the underlying futures contract price, which means these options have the best chance of being in-the-money at expiration. These options have greater time (and perhaps intrinsic) value, and their premiums are larger as a result.

13.5.2 A Short Hedge with Options: EWS Farms Wheat

A specific hedging example will illustrate these points. In the next section, we focus on a short hedge to protect against falling wheat prices. Option hedges are compared against a benchmark sale at harvest and a futures hedge in this example.

In March, EWS Farms examines alternatives for pre-harvest pricing on wheat including: a cash sale at harvest, a short hedge with futures contracts, a short hedge with a \$3.20 per bushel put option, a short hedge with a \$3.40 per bushel put option, and a fence strategy (buy a \$3.20 put option and write a \$3.90 call option). In order to compare the alternatives, a payoff matrix is created in a spreadsheet (Figure 13.8).

Current July Futures	\$ 3.46			Option Type	Strike Price	Premium
Expected Basis	\$ (0.60)			Put Prem. @	\$ 3.40	\$ 0.24
				Put Prem. @	\$ 3.20	\$ 0.15
				Call Prem @	\$ 3.90	\$ 0.15

If July Futures Price is (\$/bu)	Expected Cash Price Rec'vd	Net Price With Futures Hedge	Net Price with \$3.40 Put Option	Net Price with \$3.20 Put Option	Net Price Buy \$3.20 Put and Write \$3.90 Call Fence
\$ 3.00	\$ 2.40	\$ 2.84	\$ 2.54	\$ 2.43	\$ 2.58
\$ 3.10	\$ 2.50	\$ 2.84	\$ 2.54	\$ 2.43	\$ 2.58
\$ 3.20	\$ 2.60	\$ 2.84	\$ 2.54	\$ 2.43	\$ 2.58
\$ 3.30	\$ 2.70	\$ 2.84	\$ 2.54	\$ 2.53	\$ 2.68
\$ 3.40	\$ 2.80	\$ 2.84	\$ 2.54	\$ 2.63	\$ 2.78
\$ 3.50	\$ 2.90	\$ 2.84	\$ 2.64	\$ 2.73	\$ 2.88
\$ 3.60	\$ 3.00	\$ 2.84	\$ 2.74	\$ 2.83	\$ 2.98
\$ 3.70	\$ 3.10	\$ 2.84	\$ 2.84	\$ 2.93	\$ 3.08
\$ 3.80	\$ 3.20	\$ 2.84	\$ 2.94	\$ 3.03	\$ 3.18
\$ 3.90	\$ 3.30	\$ 2.84	\$ 3.04	\$ 3.13	\$ 3.28
\$ 4.00	\$ 3.40	\$ 2.84	\$ 3.14	\$ 3.23	\$ 3.28
\$ 4.10	\$ 3.50	\$ 2.84	\$ 3.24	\$ 3.33	\$ 3.28

Initial Margin	\$ 865.00	Future Hedge Costs	\$ 0.02
Hedge Months	6	Options Hedge Costs	\$ 0.02
Interest Rate	10%	Fence Hedge Costs	\$ 0.02
Brokerage Fee	\$50.00		

Figure 13.8 Wheat Alternatives Payoff Matrix and Assumptions

Price information is written at the top of the figure. The current futures price for a July wheat contract is trading at \$3.46 per bushel, and the expected harvest basis is \$0.60 under the futures price. To the right, three options are listed along with their respective premiums: a July wheat futures put option with a \$3.40 strike price, a \$3.20 put option on July wheat, and a call option with a \$3.90 strike price.

Assumptions for hedging costs are found at the bottom of the figure. In this case, hedging costs are comprised of brokerage fees and an interest charge on margin deposits that might be used elsewhere in the operation. The required margin deposit is \$865 for a single contract, and this margin is held for 6 months with an assumed 10% interest rate. The brokerage fees are \$50 per transaction, or \$100 for a sell and then buy round turn. To the right, hedging costs have been rounded to 2 cents per bushel.

The payoff matrix is located in the middle of the figure. It is organized with the marketing alternatives in columns from left to right, and the potential July futures prices listed in the rows. The potential prices range from \$3.00 to \$4.10 per bushel. Note that in this payoff matrix, all of the potential futures prices are listed as if they have an equal probability of occurrence – that is, it is just as likely that a \$3.00 per bushel futures price will result in July as a \$4.00 per bushel futures price.

13.5.2.1 Benchmark Strategy

The second column is the marketing alternative, the benchmark of a cash sale at harvest. Notice that when the futures price is \$3.00 per bushel, the cash price is \$2.40 per bushel because the local cash price is assumed to be sixty cents under the July futures price ($\$3.00 + (-) \$0.60 = \$2.40$). The cash price received increases with each row as the futures price increases in ten-cent increments.

13.5.2.2 Hedge with Futures Contracts

The third column of the payoff matrix is a short futures hedge. A futures contract is sold at \$3.46 per bushel (the current futures price), and an offsetting transaction is made in July. In the first row, the net price received is \$2.84 per bushel, and is calculated as the cash price received plus the futures gain/loss minus hedging costs:

(13.4) Net Price = Cash Price + (Sell Futures Price – Buy Futures Price) – Hedging Costs

OR

$$\$2.40 + (\$3.46 - \$3.00) - \$0.02 = \$2.84.$$

As the futures price increases (moving down to the next row), the net price received is locked in at \$2.84 because the gain in the cash market is exactly offset by a loss in the futures market.

13.5.2.3 Option Hedges

The next two strategies are the result of a short hedge with put options at different strike prices. The steps for this hedge are:

Step 1. When the hedge is initiated, the farmer buys a put option on a new crop futures contract whose expiration date is after harvest. The put option gives the producer the right to perform exactly the same action in the futures market that the farmer will perform with the cash crop at harvest.

Step 2. At harvest (or when the farmer is ready to sell the cash crop), the hedge is lifted when:

- a. The cash grain is sold to a buyer,
- b. The option is exercised. If so, the producer sells a futures contract at the strike price and immediately buys a futures contract of the same expiration month to offset the position. The transition is profitable because the put option strike price was greater than the prevailing futures contract price.
- c. OR, the option is allowed to expire (or sold if any time value remains). In this case exercising the option would not be profitable because the prevailing futures price is greater than the put option strike price.

Step 3. The net price received for the grain is the cash price at the elevator plus the gain from the options position less the option premium, less the cost of the hedge.

A specific example will illustrate the put options hedge. Consider the case in which the put option has a \$3.40 per bushel strike price, and the July futures contract price is \$3.00 per bushel. The price received for cash grain is \$2.40 per bushel. The option is in-the-money (has intrinsic value), because the trader can exercise the option, sell a futures contract at the strike price of \$3.40 per bushel and complete the round turn by buying a futures contract at \$3.00 per bushel. (This is the first row, fourth column of Figure 13.8). Exercising the option and completing the round turn creates profits of \$0.40 per bushel. The premium for the put option is \$0.24 per bushel and hedging costs are \$0.02 per bushel. The overall proceeds from this marketing alternative are then:

$$\$2.40 + (\$3.40 - \$3.00) - \$0.24 - \$0.02 = \$2.54 \text{ per bushel.}$$

As long as the option is in-the-money (strike price is greater than the futures price), the net price received is locked in at \$2.54 per bushel. In this case, the put options hedge has established a price floor more readily calculated as:

$$(13.5) \text{ Price Floor} = \text{Strike Price} + \text{Basis} - \text{Premium} - \text{Hedging Costs}$$

If the put option is out-of-the-money, the net price received is above the price floor and the option is allowed to expire. (We will assume that no time value exists for these calculations). The net price received is calculated in this case as:

$$(13.6) \text{ Net Price} = \text{Cash Price} - \text{Premium} - \text{Hedging Costs}$$

OR

$$\$2.64 = \$2.90 - \$0.24 - \$0.02 \quad \text{when the futures price is } \$3.50 \text{ per bushel.}$$

It is revealing to chart the marketing alternative payoffs as is done in Figure 13.9. In this chart, the net price received is measured on the vertical axis, and the July futures price is measured on the horizontal axis. Proceeds from a sale in the cash market are charted as the diagonal line that begins at \$2.40 per bushel when the futures price is \$3.00 per bushel and ends with a net price received of \$3.40 per bushel when the futures price is \$4.10 per bushel. The futures hedge is charted as the horizontal price line at \$2.84 per

bushel. The \$3.40 put option alternative begins as a horizontal line at \$2.54 per bushel and then begins increases once the futures price reaches \$3.40 per bushel.

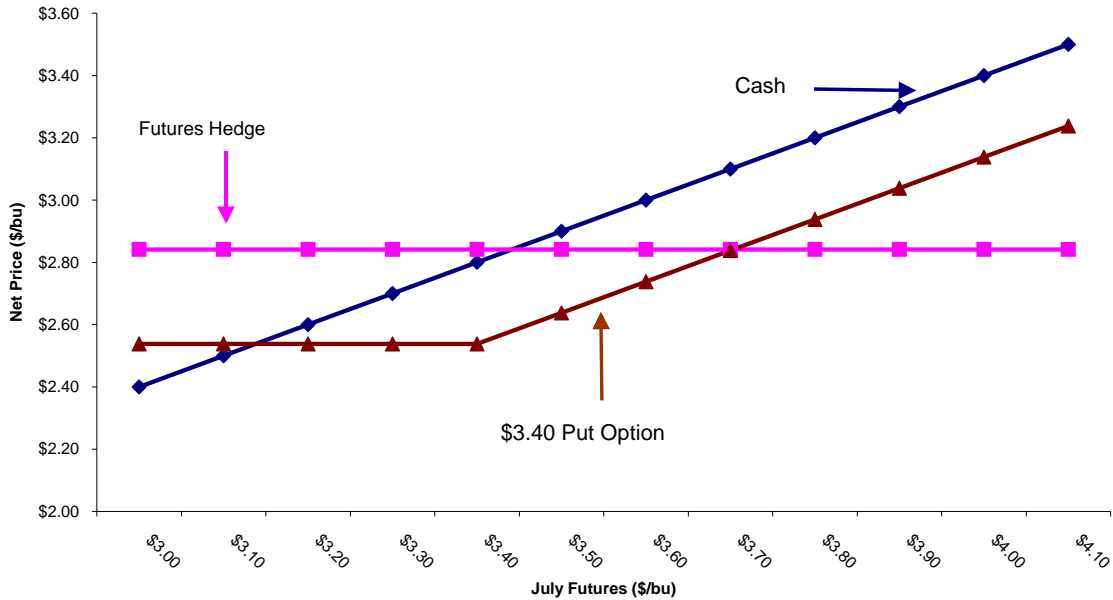


Figure 13.9 Three Marketing Alternatives for EWS Farms

The put option strategy's advantage is that it establishes a price floor but still allows the producer to take advantage of increasing prices, outdistancing the futures hedge when futures prices are greater than \$3.70 per bushel. The cost, though, is the option premium of \$0.24 per bushel, which is why the option price floor is below guaranteed price of the futures hedge. The futures hedge provides the greatest net price received until the futures price is \$3.44 per bushel, which is the point at which the benchmark strategy dominates the others. This strategy, a sale in the cash market, has both the lowest and highest net price received, and is the strategy with the most variability in net price received.

Let's return to Figure 13.8 and the \$3.20 put option hedge (5th column). The payoffs found in this column are calculated in the same way that they were for the \$3.40 put option hedge, but in this case the premium is \$0.15 per bushel and the strike price is \$0.20 lower. The net result is a lower price floor established at \$2.43 per bushel, but greater upside potential relative to the \$3.40 put option hedge. The lower floor and greater upside is best seen in Figure 13.10 in which both options hedges are charted.

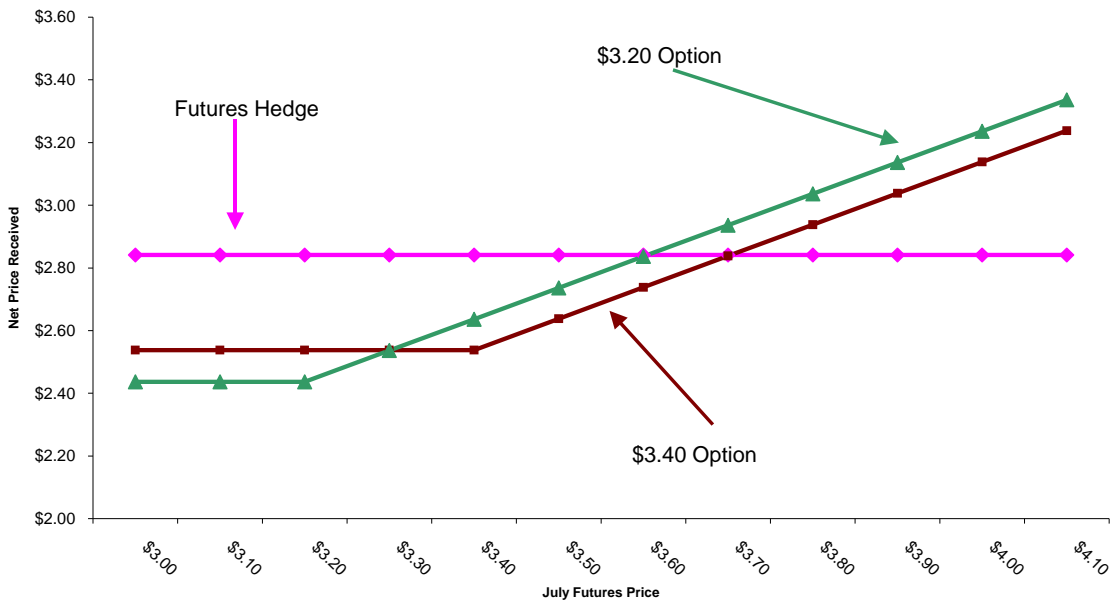


Figure 13.10 Options Hedges and Cash Marketing for EWS Farms

13.5.2.4 Fence Strategy

A final option strategy is considered in Figure 13.8's last column – the fence strategy. A fence strategy is performed when the trader establishes a hedge by buying a put option, but then defrays a portion of the put option by writing a call. When the trader writes a call, he now has to post margin and is responsible for taking a long position in the futures

market at the strike price if the option is exercised. The trader also receives the call premium, regardless if the option is exercised or not.

If EWS Farms initiates the fence strategy, a price floor will be set at \$2.58 per bushel and a price ceiling is established at \$3.29 per bushel. The price floor is in effect when the put option is in-the-money, and the floor is calculated as:

(13.7) Price Floor = Put Strike Price + Basis – Put Premium + Call Premium – Hedging Costs

OR

$$\$2.58 = \$3.20 + (-) \$0.60 - \$0.15 + \$0.15 - \$0.02.$$

The price ceiling is set at \$3.28 per bushel, and results when the \$3.90 call option is in-the-money. When the call option is in-the money, the option is exercised, and the trader must take a long position in the market to offset the option buyer's futures transaction.

The price ceiling for the fence strategy can be calculated as:

(13.8) Price Ceiling = Call Strike Price + Basis – Put Premium + Call Premium – Hedging Costs

OR

$$\$3.28 = \$3.90 + (-) \$0.60 + \$0.15 - \$0.15 - \$0.02$$

In between the floor and ceiling of the fence strategy, neither the \$3.20 put option nor the \$3.90 call option is in-the-money. In this area between the floor and ceiling, the net price received is simply:

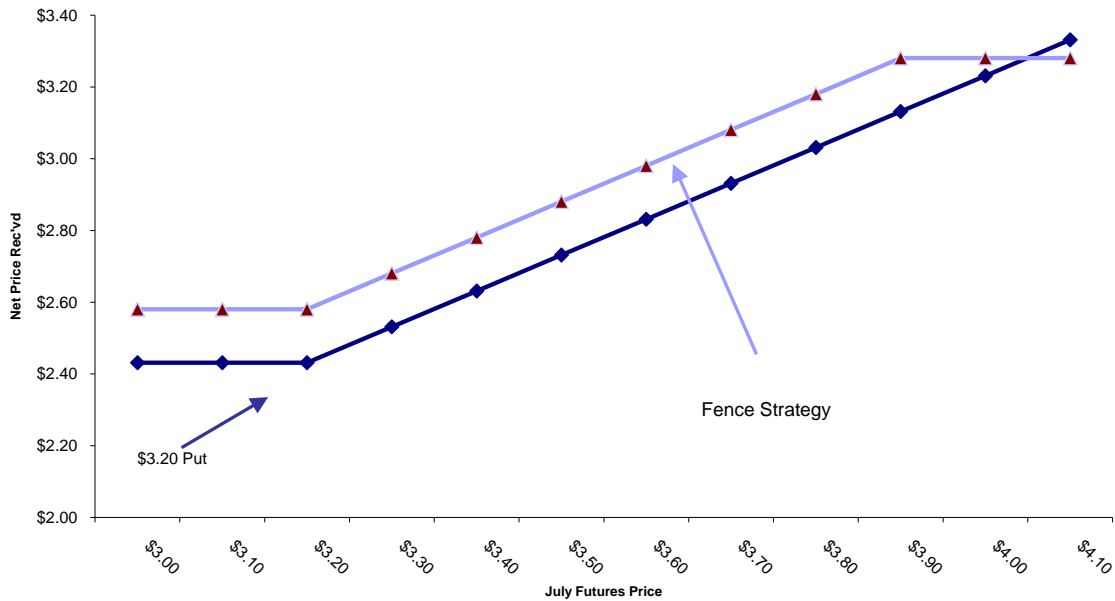
$$(13.9) \text{ Net Price Received} = \text{Cash Price} - \text{Put Premium} + \text{Call Premium} - \text{Hedging Costs}$$

OR when the futures price is \$3.50 per bushel

$$\$2.88 = \$2.90 - \$0.15 + \$0.15 - \$0.02.$$

The fence strategy is charted in Figure 13.11 along with the \$3.20 put options hedge. The price floor for the fence strategy is \$0.15 higher than the price floor of the \$3.20 put hedge, which is exactly equal to the premium received for the call. The fence strategy remains \$0.15 above the put hedge until the \$3.90 call is in-the-money. From this futures price forward, the fence strategy plateaus, but the \$3.20 put options hedge continues its upside potential.

Five alternative marketing strategies are considered in the payoff matrix of 13.8, and all of the strategies have advantages and disadvantages. Which strategy should EWS Farms' choose?



13.5.3 Choosing Among Marketing Strategies

No single marketing strategy dominates all others, and the optimal strategy may depend importantly on the EWS's preference for risk and the ability of the farm to withstand risk.

If the farm is in a good equity position and can withstand year-to-year cash flow fluctuation, a cash sale at harvest might be preferred as it nets the greatest potential return. If the farm is highly leveraged, pre-harvest pricing may be pursued more aggressively with a futures hedge. A put options hedge may provide price insurance with upside potential, and the price floor might be set to cover the crop's cost of production.

This type of insurance is more costly than a futures hedge. A fence strategy might be useful when a price floor is desired, but the premium required of a put options hedge is too large to justify the expense. In this case, writing a call may offset the premium cost, but the trader will need to post margin.

Cash flow might prove important when choosing among the marketing alternatives. Is the farm willing to post margin and make margin calls? Perhaps more importantly, is the lender to EWS Farms willing to answer margin calls? The lender's preferences for price risk management may influence EWS Farm's decision. Finally, EWS may choose to avoid expensive put option hedges if they do not have the funds to pay option premiums up front.

Market information influences the choice of pricing tactics. As an example, if futures market prices are trending upward, futures hedges tend to be expensive relative to put option hedges because of margin calls. In a sideways or choppy market, an options program may be more expensive because the up front premium costs outweigh margin calls.

Basis risk is assumed away in the strategies depicted in Figure 13.8 – futures price risk is the only risk category considered. Basis risk may also be important, and the next section describes risk management tools used for managing basis risk as well as futures price risk.

13.6 Additional Marketing Tools: Cash Market Contracts

Cash market contracts are written agreements between the grower and a local buyer such as the grain elevator, processor or feedlot. Cash contract terms, in contrast to futures contracts, may be negotiable and can vary from one contract to another. The contract

terms include setting a price or price formula (for example twenty cents above the December futures contract price quoted on November 1st). The delivery quantity, location and time are also stipulated within the contract. The differences between cash market contracts and futures contracts are described in Table 13.2.

Table 13.2. Cash Contracts and Futures Contracts Differences

Futures Contracts	Local Cash Contracts
Standardized Terms	Negotiated Terms
Value Fluctuates	Value Fixed (or Formula)
Organized by Third Party	Locally Offered
Liquidity	Less Liquidity
More Heavily Regulated	Obligation More Rigid
Transferable Obligation - Flexibility	

Much like futures contracts, local cash price contracts can be used to reduce the price volatility on a growing crop. Contracts, because of the flexible terms mentioned above, can fix all or a portion of the components that determine local cash prices. These contracts can be used to fix only the futures part of the pricing equation, fix only the basis portion of the pricing equation, or fix the local cash price.

Cash contract types include:

- Traditional Cash Contracts
- Forward Contracts
- Basis Contracts
- Delayed Pricing Contracts
- Hedge to Arrive or Futures Only Contracts

- Options Based Contracts
- Minimum Price Contracts
- Mini-Max Contracts

The focus of cash contracts is often the price, but other risks exist. As an example, these contracts have a specified quantity that must be delivered. If the grower has low yields, then additional grain might need to be purchased to fulfill the contract requirement, or cash settlement is made. Production risk is an important consideration in local cash contracts not present with futures contracts. Another risk is counter-party risk. In this case, the grain buyer cannot fulfill his obligation to pay the producer. Managing counter party risk means becoming familiar with the buyer's business and its health, being skeptical of "good" deals, asking questions, understanding the terms and conditions of the contract, understanding who holds the title of the commodity prior to delivery, and recognizing how disputes will be handled (for example by arbitration or mediation).

In the next section, typical cash contracts are described with emphasis on price risk.

13.6.1 Forward Contracts

Forward contracts negotiate the specific sale of a predetermined quantity and quality of grain for future delivery. Forward contracts fix all three components of the pricing equation (futures price, basis and cash price), so they are very effective at locking in prices and require little management. Disadvantages for this contract include missed

opportunities if prices should increase prior to delivery, yield risk for a growing crop and counter party risk.

13.6.2 Basis Contracts

Basis contracts include terms for the sale of a predetermined quantity of grain for future delivery. Rather than fixing all pricing components in advance, only the basis is fixed and the producer sets futures prices at a later date. This manages basis risk and allows for flexibility in setting the futures price, an advantage in an upward trending market. A disadvantage is that futures prices can be volatile, and these prices need be monitored so that the price can be set at a preferred time. Ongoing management suggests the producer should become acquainted with seasonal basis and futures price variation.

13.6.3 Delayed Pricing Contracts.

Rather than a price risk management tool, delayed pricing contracts are more a logistical tool to bring grain into the marketing channel. In this case, the grain is delivered and the producer can lock-in the cash price at a later date, or perhaps within a particular calendar window. This contract is an alternative to on-farm storage, but does not provide any price risk management.

13.6.4 Hedge to Arrive (Futures Only) Contract

Hedge to arrive contracts allow the producer to establish the futures price at contract signing, and then the basis is locked-in at a later date or within a specified window of time. This contract manages futures price risk, which is often the most volatile

component of the pricing equation. However, producers still face basis price risk and must actively manage the contract to lock-in the basis during the pricing window. Much like basis contracts, effective use of hedge to arrive contracts requires knowledge of seasonal basis and futures price variation.

13.6.5 Option Based Contracts

Some cash contracts mimic options hedges. Two are considered here: minimum price contracts and mini-max contracts.

13.6.5.1 Minimum Price Contracts

Minimum price contracts function much the way a put options hedge does – a minimum price is guaranteed for the crop, and the producer is allowed to lock-in a higher price should markets trend upward. However, minimum price contracts are not subject to basis risk as the both the futures price and basis is locked in to insure the minimum price.

These contracts generally have a fee associated with them.

13.6.5.2 Mini-Max Contracts

Mini-max contracts are very similar to a fence option strategy: they establish a minimum price with limited upside potential at a lower cost. Relative to the fence strategy, mini-max contracts lock-in both the futures price and the basis, so they have less price risk.

Producers are generally charged a fee for participating in mini-max contracts, but the fee is less that of a minimum price contract.

Cash contracts are an alternative price risk management tool to trading in the futures markets. These contracts generally have more terms that can be negotiated (like the quantity), but may introduce yield and counter party risk. Futures and options based cash contracts allow the producer to fix a portion of the pricing equation, but allows other terms to fluctuate during a pricing window. Flexibility to lock-in the futures and/or basis mean that the contract needs to be actively managed, and producers need to be familiar with seasonal futures price and basis patterns to make the best use of these contracts.

The previous sections have outlined tools used to manage price risk, but have stopped short of addressing a tactical marketing plan with price and date objectives. The next section presents a systematic way to perform tactical market planning.

13.7 Marketing Plans

Marketing plans are a road map of how much grain will be sold, when it will be sold, and how it will be sold (e.g., forward contract). More specifically, the marketing plan is a written outline of systematic pricing tactics with quantity and price triggers. Writing down a marketing plan, before the crop is planted, allows us to check our logic and then play “what if” : what if the farm produces only half of what we expect? What if prices are higher than we expect? When the marketing plan is reviewed, it is an indicator of past success (what works) and failure (what doesn’t work).

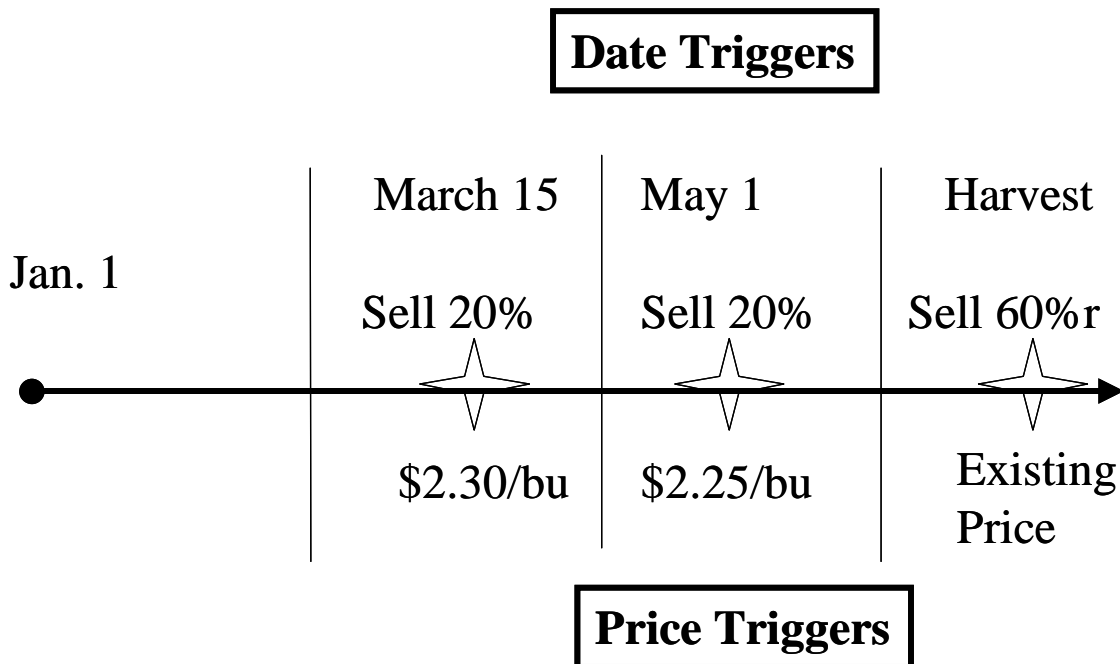
So what definition captures the essence of a marketing plan? A marketing plan is an outline of price and quantity objectives used to generate a reasonable return for the business given existing market conditions.

Let's break the definition down – examining a few words will lend meaning. The plan has price and date objectives – objectives that are really triggers for a marketing action. When a price or date trigger is met the producer sells the quantity listed in that objective. Thus, the objectives provides a road map of when the crop will be sold, and how much will be sold. In addition, a marketing plan should generate a reasonable return – reasonable in the sense that the return is consistent with the current pricing environment (existing market conditions), that it will generate something close to the market average, and that it will cover the costs of the farming operation.

Figure 13.12 represents a very simple marketing plan for corn. (A more complex marketing plan may be built using the Excel spreadsheet accompanying this book). The arrow represents a timeline from January to Harvest. The marketing plan has several date triggers, March 15th, May 1st, and Harvest. It also has several price triggers associated with the dates -- \$2.30 per bushel and

\$2.25 per bushel. The quantity objectives are sell 20% of expected production on March 15th (perhaps using forward contracts), sell an additional 20% on May 1st and sell the remainder at harvest.

Figure 13.12. Simple Marketing Plan Diagram



13.7.1 Marketing Plan: The Advantages for EWS Farms

A written marketing plan introduces discipline into the commodity marketing process. In the example, the producer has decided to sell 20% of the expected crop by March 15th under a price trigger of \$2.30 per bushel. What happens if the forward contract price is greater than \$2.30 per bushel prior to March 15th? The producer pulls the trigger and sells 20% of the crop. What happens if March 15th arrives but prices are below \$2.30 per bushel? The producer still pulls the trigger and sells the crop. In this manner, the producer guarantees that he/she is taking what the market is willing to give – even if prices are not at their best. (Note: prices might be at their high on March 15th relative to the rest of the year, and selling the crop means that the producer ensures at least a portion of the crop receives this high. Spreading sales over various points in the year is a risk diversification strategy).

Another advantage of a marketing plan is that it allows a manager to check their logic. Formally writing the plan allows the producer to examine their price, date and quantity objectives formally ask the following questions: Are the date objectives set at times when prices are at their historical best? Are the price triggers reasonable given history and current market information? e.g., is this the time of year when basis is narrow and stable, or wide and uncertain? Are the quantity objectives consistent with what I can produce? Will the quantity objectives meet cash flow needs?

Writing down a marketing plan detaches one from the decision making process. Detachment is needed because we often sell or choose not to sell our crop based on emotion. Have you ever thought “I won’t sell because I deserve more for the crop – look at the work I put in ...” or “Prices are really rising now, I’ll wait until tomorrow to get a higher price” and the price never materializes? The marketing plan detaches one from the decision by introducing decision rules.

Another advantage of a marketing plan is that it gives the proper perspective by placing the marketing decision in the context of costs and the current economic climate. As discussed previously, the marketing plan enforces discipline in decision making and allows the producer to check the logic behind their decisions. Finally, one can ask important ‘what-if’ questions i.e. What if price aren’t as high as expected? What-if I only produce fifty percent of expected production?

13.7.2 An Example Marketing Plan for EWS Farms

Let's review a marketing plan using an EWS Farms example Excel workbook. Six components exist in this marketing plan, and each component has its own worksheet. The components are titled: The Relationship Between the Strategic Risk Management Plan and the Marketing Plan, Production History and Expectations, Expected Prices, Production Costs, Price, Date and Quantity Targets, and Review and Evaluation. We'll examine these components in turn.

13.7.2.1 Putting it in Context

The first step is relating the marketing plan to strategic risk management process (SRMP). Remember, the SRMP establishes our overall strategy, and the commodity marketing plan is a tactical part of this strategy. To link tactics with the SRMP, EWS answers questions posed on the first sheet of the marketing plan example: How will the marketing plan fulfill the business plan's objectives? How do the marketing plan's objectives relate to the business plan's strategy? Is it intended to serve the financial goals of the farm? The marketing plan needs to be consistent with the business plan's long term objectives and short term goals.

What are other important considerations that deserve attention when writing the marketing plan? Is cash flow a concern? Are financial resources needed for other business enterprises? How will the marketing plan impact the farm's tax liability? Note these and other considerations as appropriate. An example for EWS farms has been provided in the Appendix Figure 1.

13.7.2.2 Production History

Knowledge of the farm's production history is very useful when setting the quantity objectives for the marketing plan. In the marketing plan example click on the 'Production History' tab, and note that EWS Farms harvested acres and yields are recorded in the shaded cells. What is the average number of acres harvested over time? And what is the average yield over time? (Note: the total production and average production are calculated for you). Is the total production predictable from year-to-year? How variable are yields? For EWS Farms (Appendix Figure 2), irrigated corn has averaged 172 bushels per acre with a high of 195 bushels and a low of 118 bushels.

The production information to the right is useful when setting the quantity targets. How much grain can the farm realistically expect to produce? Given the variability of yields, how much should the farm be willing to contract?

The planting information and the likelihood of a loss will be useful as quantity objectives are set.

13.7.2.3 Prices

Price expectations can play an important role when setting price and date triggers. A first step is to assess the historical situation: what is the average price at different points during the year? (You may wish to think about futures prices and basis separately). Does it make sense to set a date objective when prices are historically at their lowest point?

How variable are prices during the year? Does it make sense to plan on selling all of the crop when prices are the most variable?

When examining futures prices, it's often the case that pricing opportunities occur in the early Spring (in or around USDA's planting intentions report), just after corn planting begins in the Corn Belt, and just prior to the pollination period. At the same time, low prices are often seen during harvest with recovery occurring throughout the remainder of the winter. However, every cropping year is different, so it's best to assess the current situation and adjust the marketing plan to fit conditions.

University extension specialists and the USDA are good sources of current price and outlook. These specialists generally assess the situation but seldom make recommendations. Another source of information and pricing recommendations are market advisors who often provide a service to help producers "beat the market". But can someone really beat the market? AgMAS® has tracked the performance of market evaluators, and their periodic reports are located at <http://www.farmdoc.uiuc.edu/agmas/>.

So what is the difference between following the advice of a marketing service and using the marketing plan? One difference is in its perspective – a market advisor believes that information is available to him/her that other traders don't have. If they act on the information, then the advisor can "beat the market" and consistently garner profits above the market average. A marketing plan has a different focus – it seeks to average returns and avoid mistakes by spreading sales of grain while using a variety of methods. The

market advisor actively manages grain sales using price and quantity information to forecast short term results. The marketing plan is passive – we only worry about current prices as it relates to price triggers, and we only make sales when the price or date triggers are met.

Returning to the worksheet, notice the cells in which high, average and low prices can be entered. In addition, the target price or the loan rate for the crop can be entered next to heading “Farm Bill.” The prices are an assessment of potential prices in the future, and will be used to set price targets and calculate revenues. An example for EWS Family Farms is Appendix Figure 3.

13.7.2.4 Costs

It’s important to set price and quantity objectives in the context of our production costs, so click to the worksheet titled “Costs.” What costs are important?

Let’s look at the corn example, about half of the way down the worksheet. In the short term, we need to cover at least our variable costs, so use a per acre estimate of corn variable costs under the heading “revenue required per acre” next to the “Variable Cost” label. (It’s \$136.73 per acre in the EWS Farms example of Appendix Figure 4). In the longer term, we need to pay for land rent (or mortgage interest) and make payments for (or in anticipation of) new machinery. Thus, it’s good to write down the per acre sum of variable costs, land payments and machinery. Finally, our family living expenses are often covered by the farming operation, so add the per acre contribution of family living

expenses to the variable cost, machinery, and rent payment sum and write the total next to the appropriate label.

Once the totals have been entered, the price needed per bushel to meet each of the costs are placed in the column titled “Needed Price/bu @ the expected yield”. To meet corn variable costs in the example, a price per bushel of \$1.41 is needed, and the needed corn price increases to \$2.01 per bushel and \$2.13 per bushel as costs are added. Are these prices attainable given the price expectations you entered? The price expectations are found at the bottom of the corn table, and the medium price for EWS Farms is \$2.25 per bushel. After the same cost information has been entered for wheat, the farm’s expenses are summed at the top of the sheet assuming the EWS’s acreage distribution.

13.7.2.5 Price, Quantity and Date Targets

Production, price and cost information provide a good context so that actual price, date and quantity objectives can be set on the worksheet titled “Price, Date and Quantity Targets.”

The first step is to identify the date triggers in the far left-hand column. What dates seem to fit the historical pattern of prices? Are there periods when prices tend to remain high, and then decline? Setting a date trigger during the “high” period is advantageous. How does the trigger date relate to the expected production total? i.e. selling all of the crop before it is planted might be considered risky.

Next consider the method of contracting /sale. How does the method of sale influence the firm's risk position? Is there a delivery requirement, or is the pricing based on a futures hedge? Does the method of sale fix all pricing components (e.g., a forward contract) or does it allow a portion of the pricing formula to fluctuate (e.g., a basis contract)? The method of sale influences the riskiness of the revenue generated by pre-harvest and post-harvest sales.

Move to the far right column and write down the pricing objectives in the appropriate columns using your price expectations (in the upper right-hand portion of the worksheet). Are the price triggers acceptable (will they meet costs)? Given the expected price, are the trigger prices attainable?

Finally set the quantity objectives – how much should be sold each period? Are you comfortable contracting that amount? The cumulative quantities are summed under the column % priced – how much of the crop is left after each sale is made? Are you pricing the largest of portion of the crop at a time that is best for the farm business?

13.7.2.6 Monitor and Review

Notice that all of the objectives on the Price, Date and Quantity Objectives Sheet have been transferred to the pink cells on the Evaluate and Review worksheet (Appendix Table 6). Use this sheet to write down when you actually make a sale, and then compare your performance over time. What sales are you pleased with? Why? Are the circumstances

that made that sale successful likely to continue in the following year? Did you learn any new information from the sale? Why were mistakes made?

Be sure to stay disciplined and follow the price and quantity objectives. But if conditions change, take note of this and adapt the marketing plan to fit conditions. For instance, poor planting weather may make you revise the quantity objectives if you fail to plant the expected acreage. The best marketing plan is one that is reviewed often, and is a plan in which lessons learned from one year are carried over to the next.

13.8 A Little Philosophy ...

Finally, a last bit of marketing philosophy. Even when you make the best plans, unexpected events can happen – bad outcomes occur. A marketing plan will still help you to avoid some common marketing pitfalls, and for that reason it is useful. Don't abandon the marketing plan because you missed the market high! Remember the marketing plan is designed to be passive – to help you obtain a market average. The plan may prevent you from hitting the market high, but it also prevents you from hitting the market low.

Finally, be sure to design a plan that fits your operation – a marketing plan that works for one operation may not be suitable for another.

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Appendix:

Appendix Figure 1. EWS Marketing Plan Goals

[Insert Appendix Figure 1 here]

Appendix Figure 2. Production History

[Insert Appendix Figure 2 here]

Appendix Figure 3. Expected Cash Prices

[Insert Appendix Figure 3 here]

Appendix Figure 4. Production Costs

[Insert Appendix Figure 4 here]

Appendix Figure 5. Price, Date and Quantity Triggers

[Insert Appendix Figure 5 here]

Appendix Figure 6. Review and Evaluation

[Insert Appendix Figure 6 here]

The Relationship Between The SMRP and Marketing Plan

In the space provided, describe how the market plan implements the strategic risk management process. How are the farm's the long term objectives and the short term objectives going to be met in the marketing plan? What will you consider when setting the price and "sold by" objectives?

One of the farm's long run Strategic Risk Management goals is to implement the use of a marketing plan. In general the use of this spreadsheet to outline the intent to market the commodities produced reaches this goal. Specifically, the farm management wants to increase the marketing risk management strategies used in the marketing of the commodities that are produced on the farm. In a sense, this marketing plan does not achieve this goal. However, it is important to not get the horse before the cart. It is important to the management of the farm that some organized and disciplined form of marketing be implemented on the farm. This plan, then, would represent the achievement of working toward the Strategic Risk Management goal set for the marketing aspect of the farm. Also, the farm intends to evaluate the marketing alternatives that are best suited for their particular operation and geographic location. Indeed there are other marketing risk management alternatives that are available to the operation, but there is no evidence at this beginning point in time that any of these other alternatives are more suitable for the operation than the cash forward contracts that are displayed in this plan.

In the short run, the marketing plan also guides the operation toward the achievement of the Strategic Risk Management goals. Most clearly, the plan forces the management to calculate the needed revenue per acre for each of the enterprise in order to have a reference to base the pricing trigger values on. It is also built upon the underlying cost structure of the operation. These facts will allow the operation management to be confident that the marketing plan will result in an increased ability of the operation to meet the financial requirements and goals that are laid out in the strategic risk management goal statements. In addition, the use of this marketing plan will allow for increased organization of the business in that a detailed and written marketing plan will be available to all members of the operation and will serve as a reference for maintaining planned activities within the operation.

Appendix Figure 13.2

Production History

Directions: Use this worksheet to summarize the recent production history of the farming operation. Production history information will help set the quantity objectives and how much grain will be allocated to each marketing instrument.

Using the historical information to the left, input your planted acres and your expected yield. Percent of the expected yields will be calculated automatically.

Irrigated Corn

Year	Acres Harvested	Average Yield (bu)	Total Production (bu)
1	500	170.33	85,164
2	500	191.62	95,810
3	500	180.00	90,000
4	500	118.00	58,999
5	500	194.98	97,489
6	500	184.32	92,160
7	500	195.05	97,524
8	500	189.46	
9	500	177.85	88,924
10	500	121.46	60,730
10 Year Aver	500	172.3	85,200

Use these averages when setting expected production totals.

Planted Acres	Expected Yield	Expected Production
500	200	100000
90% of Expected Production	180	90000
80% of Expected Production	160	80000
70% of Expected Production	140	70000
60% of Expected Production	120	60000
50% of Expected Production	100	50000

Use the expected production totals when setting quantity targets. How much will you expect to produce? How much are you willing to contract?

Dryland Winter Wheat

Year	Acres Harvested	Average Yield (bu)	Total Production (bu)
1	650	20.20	13,131
2	842	46.41	39,077
3	650	46.40	30,161
4	842	43.13	36,317
5	650	38.62	25,101
6	842	46.13	38,845
7	620	30.24	18,746
8	842	51.33	43,224
9	650	43.80	28,472
10	842	46.36	39,039
10 Year Aver	743	41.3	31,211

Use these averages when setting expected production totals.

Using the historical information to the left, input your planted acres and your expected yield. Percent of the expected yields will be calculated automatically.

Planted Acres	Expected Yield	Expected Production (bu)
700	41	28700
90% of Expected Production	36.9	25830
80% of Expected Production	32.8	22960
70% of Expected Production	28.7	20090
60% of Expected Production	24.6	17220
50% of Expected Production	20.5	14350

Use the expected production totals when setting quantity targets. How much will you expect to produce? How much are you willing to contract?

Dryland Corn

Year	Acres Harvested	Average Yield (bu)	Total Production (bu)
1	500	60.73	30,364
2	500	53.24	26,620
3	500	51.57	25,785
4	500	60.83	30,414
5	500	53.28	26,640
6	500	63.94	31,971

Using the historical information to the left, input your planted acres and your expected yield. Percent of the expected yields will be calculated automatically.

Planted Acres	Expected Yield	Expected Production (bu)
500	50	25000
90% of Expected Production	45	22500
80% of Expected Production	40	20000
70% of Expected Production	35	17500
60% of Expected Production	30	15000

Appendix Table 13.3

Expected Cash Prices

Directions: Place your own price forecasts on this page. Choose prices for the high, medium and low categories using forecasts from USDA, extension specialists or marketing services. Use a suitable time frame, that is if you plan to sell exclusively at harvest, use a harvest forecast, or if you will sell throughout the crop year use a marketing year average price forecast. If desired, list the target price for the crop Farm Bill.

These are average cash prices at the delivery point.

Corn	(\$/bu)
High	\$ 2.75
Medium	\$ 2.25
Low	\$ 1.90
Farm Bill	

When are the historic futures price highs and lows?
 When are futures prices most variable?
 Is there a seasonal pattern to futures prices?

Wheat	(\$/bu)
High	\$ 4.00
Medium	\$ 3.25
Low	\$ 2.80
Farm Bill	

When is basis the strongest (most narrow)?
 When is the basis the most variable?
 Is there a seasonal pattern to basis?

Appendix 13.4

	B	C	D	E	F	G	H	I	J
1	Costs								
2									
3	Directions: Price and revenue targets need to be made in the context of								
4	the revenue needed to meet costs. This worksheet helps to ascertain price per bushel								
5	needed to meet costs given the expected yields. Input the cost per acre in the yellow cells below.								
6	Are the needed prices realistic given your forecasts in the pink cells?								
7									
8		Measures	Revenue required/acre						
9	Farm:								
10		Variable Costs	\$ 136.73	Calculated for you assuming a 50/50 rotation.					
11		Variable + Machinery + Rent	\$ 195.40						
12		Variable + Machinery + Rent + Family	\$ 220.15						
13							This is the price per bushel needed to achieve the revenue. How realistic are these prices relative to your forecast below?		
14	Irrigated Corn:	Measures	Revenue required/acre	Needed Price/bu. @ expected yield					
15		Variable Costs	\$ 282.86	\$1.41		500 acres			
16		Variable + Machinery + Rent	\$ 401.66	\$2.01		200 yield/ac			
17		Variable + Machinery + Rent + Family	\$ 426.66	\$2.13					
18									
19			High	Medium	Low	Farm Bill			
20		Corn Price Estimates (\$/bu)	\$ 2.75	\$ 2.25	\$ 1.90	\$ -			
21									
22	Dryland Winter Wheat:	Measures	Revenue required/acre	Needed Price/bu. @ expected yield					
23		Variable Costs	\$ 51.44	\$1.25		700 acres			
24		Variable + Machinery + Rent	\$ 86.04	\$2.10		41 yield/ac			
25		Variable + Machinery + Rent + Family	\$ 111.04	\$2.71					
26									
27			High	Medium	Low	Farm Bill			
28		Soy Price Estimates (\$/bu)	\$ 4.00	\$ 3.25	\$ 2.80	\$ -			
29									
30	Dryland Corn:	Measures	Revenue required/acre	Needed Price/bu. @ expected yield					
31		Variable Costs	\$ 115.90	\$2.32		500 acres			
32		Variable + Machinery + Rent	\$ 150.50	\$3.01		50 yield/ac			
33		Variable + Machinery + Rent + Family	\$ 175.50	\$3.51					
34									
35			High	Medium	Low	Farm Bill			
36		Corn Price Estimates (\$/bu)	\$ 2.75	\$ 2.25	\$ 1.90	\$ -			
37									
38									

Appendix Table 13.5

Price, Date and Quantity Targets

Directions: Given the price and yield information you have entered, formulate price and quantity targets that will meet your marketing plan objectives. Be sure to input the quantity sold, method for selling (e.g., forward contracts), trigger price, and target date.

Expected Price	Irr. Corn	Winter Wheat	Dry Corn
High	\$ 2.75	\$ 4.00	\$ 2.75
Medium	\$ 2.25	\$ 3.25	\$ 2.25
Low	\$ 1.90	\$ 2.80	\$ 1.90
Expected Production (bu)	100,000	28,700	25,000

Corn:		Trigger					
Target Date	Method of sale/contracting	% Priced		Bushels		Trigger Price	
		In Period	Cumulative	In Period	Cumulative	In Period	Cumulative
Early Spring (March 15)	(e.g. forward contract)	0%	0%	0	0	\$2.25	\$2.25
Late Spring (May 15)		33%	33%	33,000	33,000	\$2.35	\$77,550.00
Mid-Summer (July 15)		33%	66%	33,000	66,000	\$2.45	\$158,400.00
Harvest (December)		34%	100%	34,000	100,000	\$2.50	\$243,400.00
Alter dates to fit your needs.							
Wheat		Trigger					
Target Date	Method of sale/contracting	% Priced		Bushels		Trigger Price	
		In Period	Cumulative	In Period	Cumulative	In Period	Cumulative
Prior to October 15	(e.g. forward contract)	0%	0%	0	0	\$3.00	\$3.00
Late Winter/ Early Spring (March 15)		33%	33%	9,471	9,471	\$3.10	\$29,360.10
Late Spring (May 15)		33%	66%	9,471	18,942	\$3.20	\$59,667.30
Post-Harvest(Sept)		34%	100%	9,758	28,700	\$3.30	\$91,868.70

Alter dates to fit your needs.

Appendix Table 13.6

Review and Evaluation

Directions: As the marketing year progresses, record sales of the crop on this worksheet and compare to the planned triggers, while noting any points of interest (unexpected conditions, circumstances changing expected production levels). Reviewing the record will prove useful in revising the marketing plan for the next season.

Corn:		Target			
Date	Method(s) of contracting / sale	Bushels		Target Price	
		In Period	Cumulative	In Period	Cumulative
Early Spring (March) (e.g. forward contract)		0	0	\$2.25	\$2.25
Late Spring (May 15)		33,000	33,000	\$2.35	\$77,550.00
Mid-Summer (July 15)		33,000	66,000	\$2.45	\$158,400.00
Harvest (December)		34,000	100,000	\$2.50	\$243,400.00

Corn:		Actual			
Date	Method(s) of contracting / sale	Bushels		Target Price	
		In Period	Cumulative	In Period	Cumulative
			0		\$0.00
			0		\$0.00
			0		\$0.00
			0		\$0.00

Actual Production:	
Amount Purchased to Fulfill Contracts	
Total Cost of Purchased Grain	

Wheat		Target			
Date	Method(s) of contracting / sale	Bushels		Target Price	
		In Period	Cumulative	In Period	Cumulative
Prior to October 15 (e.g. forward contract)		0	0	\$3.00	\$3.00
Late Winter/ Early Spring (March 15)		9,471	9,471	\$3.10	\$29,360.10
Late Spring (May 15)		9,471	18,942	\$3.20	\$59,667.30
Post-Harvest(Sept)		9,758	28,700	\$3.30	\$91,868.70

Wheat		Actual			
Date	Method(s) of contracting / sale	Bushels		Target Price	
		In Period	Cumulative	In Period	Cumulative
			0		\$0.00
			0		\$0.00
			0		\$0.00
			0		\$0.00

Actual Production:	
Amount Purchased to Fulfill Contracts	
Total Cost of Purchased Grain	