

## Managing Market Risk by Forward Pricing

### Quick Notes...

Forward pricing strategies can minimize the impact of market price variation.

Strategies for making a profit:

- cost of production lower than industry average.
- prevent selling prices below cost of production.
- sell significant annual production above cost of production.

Understand the marketing tools and develop a plan to use them.

### Introduction

The production risks inherent in producing agricultural products such as grain, livestock, fruits and vegetables are certainly great. The biological nature of production, with its exposure to weather variability, insect and disease pests causes the supply available to the marketplace to be variable. Therefore the prices generated by a market with these characteristics are also highly variable. Most of the major agricultural commodities produced in Colorado, are characterized by many producers, competing to produce a uniform product at a low cost. They are competing not only with Colorado producers, but with others throughout the United States, and in some products, the world.

Therefore, the individual producers' production has virtually no impact on market prices. However, the individual producer can select various prices offered by the marketplace using forward pricing strategies or tools and minimize the impact of market price variation on the financial success of their operation.

### Price Enhancement vs: Risk Management

At times some producers have difficulty distinguishing between actions that enhance their overall selling prices and those that manage risk. Some of the available pricing instruments or tools, can cause this confusion. Traditionally, if a producer took action pricing production by cash market sales, forward cash contract- ing or hedging with futures contracts, not only was the risk of price decline eliminated, but also the opportunity of price increases.

It is now possible, with the use of agricultural option contracts to manage price risk without eliminating price increase opportunities on a given quantity of production.

Successful producers need to clearly understand if their financial objectives call for price risk management or price enhancement.

The risk in selling agricultural production is if selling prices are below profit objectives, break-even objectives, or worst of all cash flow objectives.

Eliminating the chance of these adverse outcomes is price risk management. This activity alone can have very positive impacts on the long term financial success of a farm or ranch business.

It may be most wise to worry about capitalizing on prices at or above profit objectives, after the risk of adverse selling prices is dealt with. Additionally, pricing activity does not need to be an "all or nothing" proposition. Selling at least a portion of annual production at or above annual average prices-in combination with eliminating sales at prices below break-even costs-can have positive long term financial results.

### Financial Goals

It is impossible to determine success or failure in marketing grains, livestock, or other agricultural products, unless the cost of producing that product is known. A producer may have sold their grain for \$.30 per bushel more than their neighbor, but may have spent \$.40 more per bushel to produce it. Therefore, it is vitally important to determine what production costs are for each product produced not only on a per acre or per head basis, but on a per bushel or per hundred weight basis. Then a producer should determine if current pricing opportunities are offering good returns or poor returns relative to his last several years of records. This means a producer must work very hard through their record keeping system to accurately allocate total farm costs to each of their enterprises.

Allocating too much indirect costs to one enterprise will result in a break-even price calculation that is too high)and market prices that are offered, will never look satisfactory.

Economically, in competitive markets such as grain and livestock, prices are always attempting to equal or reach the industries' average

break-even costs. This would result in supply and demand equilibrium. However, with the uncertainties of weather and various other factors in agricultural production, prices pass through, or only temporarily reach equilibrium, but never stay at that point for long.

As a result, over the long-run, prices will likely be under the industry's average break-even cost of production 50% of the time and over the break-even costs 50% of the time.

For the individual producer competing in the market, this implies that the three most basic strategies for making a profit are: 1) achieve a cost of production lower than the industry average, 2) prevent selling prices below cost of production)risk management, and 3) selling a significant portion of annual production above cost of production)price enhancement.

In determining an individual's pricing objectives it is very useful to determine these in the following suggested manner:

***Risk Management*** - What selling price multiplied by a conservative expected yield or rate of gain, will meet the minimum cash flow requirements of the business? This would be the minimum required to pay debts and family living expenses. What pricing tool you utilize for this objective should be evaluated carefully, depending on your financial condition.

***Price Enhancement*** - What selling price multiplied by a conservative expected yield or rate of gain, will offer a profit that historically occurs fairly frequently and is reasonable?

This may be a first selling point. Second and third selling points of increasing portions of your production maybe at prices that historically occur infrequently and offer exceptional profits.

### **The Basic Mechanics**

## Price Cycles, Seasonal Patterns, Trends and Fundamentals

Even if a producer never utilizes a forward pricing tool or strategy, knowledge of price movements can be of great assistance in cash market sales alone. Most major agricultural commodities, because of the biological nature of their production express some very distinct long-term price patterns over and above supply and demand fluctuations within the year.

**Cycles** - are probably most distinct in livestock production. Because of the inherent breeding cycle for each species of livestock, time is required to buildup a breeding herd before a significant number of offspring are available from this increased factory capacity to be sold as slaughter animals. Breeding herd sizes are usually increased during periods of larger profits, and decreased during periods of negative returns. As a result, long-term price cycles have been observable for most of this century. Cattle markets have historically demonstrated a cycle that is from six to eight years in length from its low price point to the next major low price point. Hogs have historically demonstrated a cyclical pattern that is two to three years in length from "low to low", or from "high to high".

**Seasonal Patterns** - Observing five to ten years of price history for a given commodity will reveal fairly distinct seasonal price movements within the year. These movements are fairly logical from a supply and demand standpoint.

Winter wheat historically peaks in price in December or January, and is at its lowest point in July and August. Most of the supply is harvested in June, July and August, and is readily available to buyers.

Beef yearling and calf prices typically bottom in October to November of each year) when most pastures are no longer providing forage and calves are being weaned and sold.

Yearling and calf prices historically peak in March and April, just as the new years' calf crop is being born and pastures are beginning to produce.

Knowing seasonal patterns can be very helpful in determining if it is likely to be profitable to store grain after harvest, or possibly purchase yearlings to pasture for the summer. If prices have already moved up more than their historical seasonal move, it may be time to sell before prices decline.

**Trends** - Identifying both long-term and short-term price trends may be more art than science. But, as the saying goes, "a picture is worth a thousand words". Viewing a chart of prices of the products you produce can be very helpful in giving some perspective to day-to-day or week-to-week price movements. If, for instance prices for the last two days have been lower. But, when looking at a price chart it may be apparent that prices have not penetrated an obvious line of price support. Therefore, longer term, they are still trending upwards.

By the same token recent price increases may appear to be in an upward trend. But, if they have not penetrated an obvious long-term line of resistance on the price chart, chances are prices are still trending downward.

**Cost of Production** - To make any chart of price cycles, seasonal or trend patterns make any marketing sense, plot your break-even cost of production and maybe other pricing objectives on the chart.

**Availability of Charts** - You can certainly make your own price charts by plotting prices from the newspaper, radio or your local elevator. Also, many farm publications, university publications, consulting services, or commodity brokers have charts available, although they are usually dated. Market data satellite systems such as FarmDayta or DTN have very convenient, daily updated charts

"on-screen" with some analysis options available.

### ***Supply and Demand Fundamentals -***

Markets for agricultural commodities are probably some of the most purely competitive markets in the United States. In a competitive market, prices are free to move as the indicator to producers when more or less supply is needed to meet demand. As a result, fundamental indications of factors effecting supply and demand are very important information. That is why U.S.D.A. began collecting and publicly disseminating market news and prices. Crop planting reports, harvested acre reports, cattle inventory reports, cattle on feed reports and other statistical information effecting potential supplies are reported. Additionally, there are reports such as export, oilseed processing, and livestock slaughter that attempt to give some indication of demand conditions.

Many private commodity firms, grain companies and consulting firms also collect and analyze similar data.

All of this effort is an attempt to quantify fundamental factors that will effect future supply and demand, and therefore, prices. Competitive markets prove to be more efficient if there is good information available to producers and consumers upon which they can base decisions.

Although no one can consistently forecast future prices, it is useful to be aware of this information. For instance, it is true that a majority of the corn in the United States is produced in Iowa and Illinois. So growing conditions in those states have a great influence on the national supply and therefore, prices. Listening to these, in combination with charting market trends with other tools, can keep you aware of major price trends and possible price risks and opportunities.

### **Localizing Forward Prices With Basis**

An essential element of understanding marketing and successfully executing strategies is developing a good working knowledge of basis. Basis is simply a measure of the relationship of two different markets for the same product. This measurement is determined by studying the historical price differences between the two markets. For example, the price paid for wheat in Denver, Colorado is usually (historically) different than the price paid for wheat in Yuma, Colorado. Overtime, you would expect this price difference to equal the cost of transportation between the two markets. Price differences can occur because of the location of markets, product quality differences, and time of delivery. All of these factors are differing supply and demand forces affecting the two markets.

Basis affects all forward pricing activity. Most forward cash contracts are based on futures market prices. Futures market prices reflect national supply and demand expectations for future deliveries of a commodity. If a local grain elevator is offering to purchase grain for July delivery for \$3.60 per bushel, and if cash prices for the last three to five years at the local elevator have usually been \$.40 per bushel less than the expiring July futures contract, then the previously mentioned forward cash contract offer is probably being offered at a reasonable basis. In April, if a producer were to consider hedging July sales directly by selling a July futures contract, they would need to estimate what a July futures price means in terms of an estimated local hedge price. This would be accomplished by utilizing a historical basis estimate. By using the previously mentioned minus \$.40 per bushel, a producer would for instance; estimate that if they sold a July Futures contract today, in April, at \$3.70 per bushel, they would likely realize a local hedge price of \$3.30 per bushel when they sell the grain at the local elevator in July) and buys back the futures contract. A \$3.70 per bushel futures price minus \$.40 per bushel estimated

historical local basis equals an estimated hedge price of \$3.30 per bushel.

**Location** - Basis may vary from one local grain elevator to another. Occasionally one grain elevator is short on supply or may have several large orders to fill. This will create opportunities between local cash markets, if a producer is fast to act and understands transportation costs.

**Seasonal Variation** - Basis is not the same all year long. Usually basis is weaker, (more negative), during and just after harvest. Basis is usually stronger, (more positive), at the end of the storage season or before harvest. In livestock, basis is usually most negative during the time period when the offspring of the breeding herd, from the previous calving or farrowing season are coming to market. Seasonally weaker basis occurs in the fall for calves and spring and fall for hogs.

**Quality or Grade** - These differences are most apparent in livestock. Choice slaughter steers sell for a higher price and stronger basis, than lower grade slaughter steers. U.S. Number 2 corn will sell at a stronger basis than U.S. Number 3.

**Commodity Type and Uses** - Hard red winter wheat prices will be different than soft winter wheat prices. Oil type sunflower prices are different than confection sunflower prices. Steer prices are different than heifer sell prices. 700 pound steer prices are different than 500 pound steer prices. As a result the basis for each will be different.

**Developing and Understanding Basis** - It is necessary to be a student of basis in the major products you produce. This knowledge is as important as knowing the cost of production. A producer can keep his own historical basis data by recording cash and futures prices from: the radio, newspaper, local elevator or packing plant. Some brokers and grain elevators way provide basis data. Some

universities also maintain basis data. When recording your data, you should be very honest regarding the typical quality of your product, especially in livestock production.

### How to Use Basis

In addition to evaluating futures contract prices by localizing them for hedging purposes, basis can be used in the following ways:

**1. Evaluating Forward Cash Contracts** - As previously discussed, a working knowledge of the historical basis for the seasons of the year in which you typically sell product is very helpful for evaluating the fairness of cash contract offers by local grain elevators or livestock buyers. Cash contract offers that are higher than the appropriate futures contract price minus the historical basis estimate are good. Offers significantly less than this price, may not be so good and should be scrutinized.

**2. Completing Hedge Transactions and Managing Basis Variation** - When a hedge is about to be completed, the only price risk remaining is basis variation differing from the initial estimated basis. When it is time to actually sell your product in the cash market and buy back your futures contract, you will realize a higher hedged price than expected if these transactions are completed when basis is stronger (more positive), than expected. You will realize a lower hedge price than expected, if basis is weaker (more negative), than expected. The basis impacts when utilizing options are the same as when hedging with futures contracts.

Variation in actual basis at the time of cash sales, from what you estimated would occur according to history, can effect your forward pricing results with practically any marketing tool. It is important to understand these impacts. The following examples are based upon futures contract hedges. Futures contract hedges are utilized because virtually all forward pricing tools, cash market trading

and merchandising are based on futures market prices. This is true because a futures price is a national price based on national or even world-wide supply and demand expectations. Additionally, anyone involved in the cash market of a commodity can utilize a futures contract to create a "risk-reduced", market position.

As an example, suppose a producer sells October Live Cattle futures at \$68.00/cwt. They expect a local basis of minus \$2.00/cwt in October when the cattle reach slaughter weight; therefore their expected local hedge price is \$66.00 (\$68.00/cwt.-\$2.00/cwt).

In October when the cattle are ready to be slaughtered and the hedge is liquidated (futures bought back) and the cattle are sold in the cash market locally if the:

*Actual (realized) basis the same as estimated basis;*

If Oct. Futures Are	Gain or Loss From Futures	Local Cash Sale	Realized Price	Actual Basis Cash-Futures
\$73	-\$5	+ \$71	= \$66	-\$2
\$68	\$0	+ \$66	= \$66	-\$2
\$63	\$5	+ \$61	= \$66	-\$2

*Actual (realized) basis stronger (more positive) than estimated basis;*

If Oct. Futures Are	Gain or Loss From Futures	Local Cash Sale	Realized Price	Actual Basis Cash-Futures
\$73	-\$5	+ \$71.50	= \$66.50	-\$1.50
\$68	\$0	+ \$66.50	= \$66.50	-\$1.50
\$63	\$5	+ \$61.50	= \$66.50	-\$1.50

*Actual (realized) basis weaker (more negative) than estimated basis;*

If Oct. Futures Are	Gain or Loss From Futures	Local Cash Sale	Realized Price	Actual Basis Cash-Futures
\$73	-\$5	+ \$70.50	= \$65.50	-\$2.50
\$68	\$0	+ \$65.50	= \$65.50	-\$2.50

$$\$63 \quad \$5 \quad + \quad \$60.50 \quad = \quad \$65.50 \quad \$-2.50$$

The key concept to understand from these examples is that the more positive the basis, the better for the hedger (producer). A more positive basis results in a higher realized hedge price. At the conclusion of a hedge or any market selling activity, this is true. If the actual basis is equal to or more positive than the estimated basis during the expiration of a hedge) it is wise to complete the hedge transaction at that time. If the actual basis is weaker (less than) the estimated basis, the hedger may want to wait for basis to return to normal levels before liquidating the hedge.

This management concept holds true for livestock or grain and whether using futures hedges or option contracts. This basis variation is referred to as basis risk. When someone offers you a forward cash contract, they are assuming the basis risk. Therefore your cash marketing activities need to be evaluated based upon currently available hedges.

**3. Short-term Pricing Opportunities** - Often times we think of forward pricing as a long-term proposition. Sometimes there are short-term opportunities that arise when your grain or livestock is un-priced, that you can capitalize on.

You may, for instance, be planning on selling your grain at the local elevator in a few weeks. You notice that basis, (cash prices minus the nearby futures contract prices) is \$.15 per bushel weaker, (more negative), than usual for that time of year. You expect that futures and cash prices will converge to a normal (historical average) basis by the time you sell your grain at the local elevator. This could occur by futures prices decreasing, cash prices increasing, or both occurring. Therefore you sell a futures contract in the nearby contract month. If cash and futures prices do indeed converge to normal levels by the time you sell your grain at the elevator, you will have

realized a \$.15 per bushel gain from this basis strengthening over the cash price available the day you executed the transaction. There is some risk that all prices may have moved up much more than \$.15 but, this would only occur if there were unexpected supply news that could not be predicted. This strategy should probably not be attempted near the time of U.S.D.A. crop reports.

#### ***4. Indications of Overall Price Trend***

***Changes*** - Basis relationships of cash market prices to futures market prices are normally much more predictable than overall market price levels. Therefore if basis is drastically different than historical averages it is usually an indication that market supplies are fundamentally different than normal.

If for instance, your local basis is normally minus \$.25 per bushel for wheat and it is currently a positive \$.10 per bushel, (cash prices greater than futures prices), it is an indication that your local cash market is in short supply of wheat and is paying a premium. This may be one indication that now is a good time to sell or that futures prices may go higher. However, if basis is minus \$.40 per bushel, this may indicate that your local market currently is over supplied with wheat and now may not be a good time to sell or futures prices may be going lower.

Basis should not be used as the sole indicator of market price changes only in combination with other fundamental indicators. Long-term basis relationships are fundamentally very strong.

#### **Basic Forward Pricing Strategies**

(Note: These examples show actual basis the same as estimated basis-this is done to keep the examples simple-see basis section for realistic basis management).

##### 1. Locking in a Fixed Selling Price) Selling Futures

This traditional hedge offers a "locked-in" or

guaranteed price plus or minus any variation in actual basis from expected basis. The expected local hedge price is equal to the short futures price plus or minus the expected local basis. Selling futures is less attractive than forward cash contracting in that a futures hedge does not lock in a precise price, due to the inability to perfectly predict basis. Selling futures is more attractive than forward cash contracting in that it allows the flexibility of altering the pricing decision and capitalizing on a strong basis.

##### *Advantages*

- Guarantees price subject to basis variation from estimates.
- Yields highest price of any marketing tool, if market declines significantly after pricing.
- Can price as much as 12 months in advance.

##### *Disadvantages*

- Attempts to capitalize on price increases involves re-exposure to market risk.
- Margin call responsibility.

##### *Liquidation*

To liquidate or complete a hedge, you buy back a futures contract in the same month you previously sold and sell your product in the local cash market offering the best basis.

##### *Example*

A producer sells December corn futures at \$2.60/ bushel. They expect a local basis of minus \$.25/bushel in late November and early December, when their corn harvesting is

completed. Therefore their expected local hedge price is \$2.35/bushel. (\$2.60 - \$.25).

In November or early December when the corn is harvested:

If Dec. Futures Are	Gain or Loss From Futures		Local Cash Sale	=	Realized Price
\$2.80	-\$0.20	+	\$2.55	=	\$2.35
\$2.60	\$ 0	+	\$2.35	=	\$2.35
\$2.40	\$.20	+	\$2.15	=	\$2.35

## 2. Locking a Fixed Selling Price) Forward Cash Contracting

This pricing instrument is probably most familiar to producers. It has been offered and utilized for years at local grain elevators, feedlots and by some livestock buyers. Essentially it is based upon the futures hedge. The grain elevator or feedlot offering the producer the forward cash contract, usually offsets the risk of this purchase by a "short" futures position. Therefore it is essential for the producer to understand a futures hedge and basis to determine how reasonable a forward contract price offer is.

### *Advantages*

- Guarantees a price with no further basis variation.
- No margin call responsibility.
- Usually locally available.

### *Disadvantages*

- Must deliver product to contractor.
- Tendency to wait for highest price before pricing - prolongs market risk exposure.
- Cannot capitalize on strong basis.

### *Liquidation*

To liquidate or complete a forward cash contract a producer must fulfill the terms of the contract. This usually involves delivering the quantity and quality of product specified to the delivery point at the time specified.

### *Example*

A producer forward cash contracts corn for December delivery at his local elevator for \$2.30/bushel. December corn futures contracts are trading at \$2.60/bushel. They expect basis to normally be minus \$.25/bushel in December. This means that the basis being offered in the forward cash contract is minus \$.30/bushel (\$2.30 - 2.60).

In December when the corn is harvested:

If Dec. Futures Are	Local Cash Price	Forward Contract Price	=	Realized Price
\$2.80	\$2.55	\$2.30	=	\$2.30
\$2.60	\$2.35	\$2.30	=	\$2.30
\$2.30	\$2.15	\$2.30	=	\$2.30

## 3. Establishing a Minimum Selling Price- Buying Put Options

Purchasing a put option gives the producer a minimum or "floor" price without limiting the opportunity of price increases. The floor price that a put purchase offers is the strike price of the option minus the premium cost, localized by the estimated basis. However, if futures prices increase above the strike price by the time the put option is about to expire and your product is ready for market, you receive the current cash price less the amount of premium you paid for the put option. In this scenario of increasing market prices, the put will have declined in value and probably will expire worthless. More expensive (higher strike price) puts offer a higher floor price but a lower net price if prices increase. Less expensive (lower strike price) puts offer a lower floor price but more opportunity of gaining from market price increases.

### *Advantages*

- Can establish a minimum price without a maximum.
- No margin calls.
- Many levels of price insurance (strike prices) to choose from.

- Can change strike prices later without exposing to market risk.

#### *Disadvantages*

- Premium costs; purchasing a long time period of protection in a volatile market is expensive.
- May not offer protection as far into the future as futures contracts.

#### *Liquidation*

When you sell your crop or livestock in the cash market, you would usually sell the put if it has a value. If prices have increased, the put will probably expire worthless and would not have to be liquidated (sold). Exercising the put is an alternative for the buyer and will result in a short futures position at the strike price of the put. Few producers exercise options. You would only want or need to exercise a put option if you would be comfortable with the resulting futures position and; livestock had not gained as rapidly as you planned on and you need more time or basis is abnormally weak. If you do exercise the put, you would later have to liquidate the short futures position just as you would in a normal futures hedge.

#### *Example*

A producer purchases a November \$72 put for \$2/cwt. to price 500 pound calves. November feeder cattle futures are trading at \$73/cwt. Estimated basis for the end of October and early November is a positive \$6/cwt. Therefore the estimated local minimum price offered by this put purchase is; \$72 (strike price), minus the \$2 premium plus the \$6 basis equals a \$76/cwt. minimum price. In November when the calves are ready for market:

If Nov. Futures Are	Value of 72 Put	72 Put Gain/Loss	Local Cash Sale	Realized Price
\$84	\$0	-\$2	+ \$90	= \$88
\$74	\$0	-\$2	+ \$90	= \$78
\$64	\$8	\$6	+ \$70	= \$76

#### 4. Establishing a Minimum Selling Price - Minimum Price Contract

At many local grain elevators and some feedlots or packing plants, a form of forward cash contract is available that offers many of the benefits of purchasing put options directly yourself. The primary benefit being the ability to establish a minimum forward selling price while still maintaining the ability to capitalize on market price increases. In essence the contractor is purchasing a put option for you or creating "put like" market position. Therefore, to analyze this alternative you should compare them to current opportunities purchasing put options directly yourself. After a minimum price contract is offered make sure you subtract any service charges and fully understand the terms and conditions of the contract. Compare this to various put option strike prices, minus their current premium costs adjusted by your local basis estimate.

#### *Advantages*

- No futures or options account required.
- Minimum price with price increase opportunities.

#### *Disadvantages*

- Must deliver to contractor so can't capitalize on stronger than expected basis.
- Cannot change strike prices later.
- Service charges.
- In some cases must take additional action to capitalize on higher prices.

### *Liquidation*

To fulfill your contract obligation you must deliver to the contractor meeting all your commitments in the terms and conditions of the contract.

### *Example*

See the put option example) only difference is you do not have to purchase put option or manage basis yourself. Subtract service charges and any additional basis discounts.

## 5. Other Cash Market Contracts

Nowadays there are many new types of cash market contracts available, especially at grain elevators. Most offer a lot flexibility and significantly add many alternative marketing tools to your tool kit. All require delivery to the contracting cash market.

A very useful suggestion is to always make sure you understand the terms, conditions, and your alternatives in each type of contract under various market conditions. Just as demonstrated in the previous tables for each marketing strategy) you should always calculate the mathematics and realized price) under various market conditions. The various conditions should; be increased the same and decreased market price levels.

A few of these alternative contracts are; offer contracts, deferred payment contracts, price later contracts, extended price contracts, hedged to arrive contracts, enhanced pool contracts, basis contracts and flex contracts.

Always make sure you understand the specifics of any contracted obligation before you make a commitment as you must fulfill your contractual obligations.

### **Adjustment and Follow-up Strategies**

When planning marketing activities it is very important to construct alternative strategies

should conditions change drastically and new opportunities and risks present themselves in the marketplace. So that you do not lose sight of risk management, follow-up actions should be pre-planned for various market activity that could occur after the initial pricing action. Often times some producers can become so involved in excitement of dynamic market price movements that they may have modified initial forward pricing actions without contemplating the implications of possible adverse outcomes.

This reality has damaged the attitude of many market participants with regard to price risk management. Creating a plan and incorporating logical follow-up strategies into that plan is vital to removing emotion from your marketing decisions.

### 1. Converting a Fixed Price to a Minimum Price - Purchasing Call Options After Forward Cash Contracting

Most producers regret missing the opportunity of a market rally after they have forward contracted in their local cash market at a fixed price. Also, it has usually been good advice to not forward contract all of your production as crops may not yield as they should due to weather risk or livestock may not gain as well as they should.

Producers who have already forward cash contracted can continue to avoid the risk of market declines, but restore market "upside" potential by buying a call option as a follow-up adjustment to their marketing strategy.

By purchasing a call option, you can restore the opportunity to gain from price increases without sacrificing "downside" price protection. This can occur because call options increase in value when market prices increase. In effect, the fixed contract price is converted to a minimum or floor price much

like a put option. Even though you must

deliver to fulfill your cash contract, you can separately modify your market opportunity position.

The further the strike price of the call you select is above the futures price at the time of contracting, the greater the price increase required before you will begin to realize a higher price. If you select a call strike price that is lower (closer to the futures price), price gains will be realized much more quickly in a rising market. However, the lower the strike price you choose, the more premium you'll have to pay and the lower the resulting floor price will be.

*Advantages*

- Riskless way to restore price increase opportunity to a cash contract or futures hedge.
- Can help protect against risk of crop failure after cash forward contracting action is taken.

*Disadvantages*

- Added cost - Premium of call purchase.
- Timing is important; if call is purchased after cash contract - market may have already increased.

*Liquidation*

Sell the call when your grain or livestock are ready to market, if it has value, or let it expire worthless. Deliver on your cash contract to fulfill you contracted obligation.

*Example*

A producer has forward contracted their wheat production through his local grain elevator. The producer checks the premium costs of wheat call options to determine if they should purchase one to restore their ability to capitalize on price increases. This follow-up action could be taken after a price decline when calls are much cheaper, at the time the cash contract is initiated or anytime after contracting and a price increase is anticipated.

The producer forward cash contracts their wheat for July delivery to the local grain elevator for \$3.30/bushel. The September wheat futures contract is trading at \$3.65/bushel (note; many merchandisers determine basis from the next to expire futures contract month, when offering a contract to a producer in the previous futures expiration month). Usually they expect basis to be minus \$.35/ bushel in July.

As spring and early summer proceed, he becomes concerned that prices could go higher by the time they is obligated to deliver on their cash contract. This is caused by uncertainty of weather conditions affecting the U.S. crop. They purchase a \$3.70 call option for \$.10/bushel premium. Now their combined market position is; \$3.30/bushel contract price minus \$.10/bushel call premium equals a minimum price of \$3.20/bushel.

In July when their wheat is harvested and delivered to the local elevator:

a. Without Follow-up

If Sept. Futures Are	Cash Prices	Forward Contract Price	Realized Price
\$4.00	\$3.65	\$3.30	= \$3.30
\$3.50	\$3.15	\$3.30	= \$3.30
\$3.00	\$2.65	\$3.30	= \$3.30

b. With Follow-up

If Sept. Futures Are	Cash Prices	Value of \$3.70	\$3.70 Call Gain/Loss	Forward Contract Price	Realized Price
\$4.00	\$3.65	\$ .30	\$.20	+ \$3.30	= \$3.50
\$3.50	\$3.15	\$ .00	-\$ .10	+ \$3.30	= \$3.20
\$3.00	\$2.65	\$ .00	-\$ .10	+ \$3.30	= \$3.20

2. Converting a Minimum Price to a Fixed Price - Selling Futures or Cash Contracting After a Put Option Purchase

Often a producer may be committed to a production situation in which they think prices are going to increase, but still wants some price risk protection. This may be due to greater than normal production risks in the form of; extra cropland rented or purchased, extra pasture leased or extra cattle or hogs on feed. Just in case they want some low-cost insurance while waiting for a possible price increase. The risk of adverse price movements occurring while waiting for price increases is a situation that can cause disastrous results for a producer.

The way to accomplish this objective is to purchase a low-cost put option to achieve some risk protection while waiting for a more favorable pricing opportunity. If the more favorable pricing opportunity does occur at a later date, the producer can lock in those selling prices by forward cash contracting or even selling futures, contracts.

*Advantages*

- Risk Management while waiting for a more favorable pricing opportunity.
- Can lock in a more favorable price that occurs before ready for cash marketing.

*Disadvantage*

- A drastically lower price could occur before a follow-up cash contract is in place.

*Liquidation*

Sell the put or let it expire if it has no value and deliver on the cash contract to fulfill that obligation. The put can be liquidated (sold back) when the follow-up cash contract is initiated, but it is not essential and adds no risk if it is not liquidated until later.

*Example*

A producer purchases a December Corn \$2.40/ bushel put option for \$.07/bushel. December corn futures contracts are trading at \$2.50/bushel. They expect their local basis to normally be minus \$.10/bushel in December. Therefore their estimated minimum sale price

from the put purchase is; strike price of the put \$2.40 minus the put premium \$.07 minus the basis \$.10 equals \$2.23/bushel.

In the following two months, December corn futures contract prices increase to \$2.90/bushel. With two months remaining before their corn is ready for harvest they request a forward contract bid from their local elevator for December delivery. The elevator manager offers them a cash contract of \$2.70/bushel. The producer agrees to the cash contract at \$2.70 and retains the put they previously purchased.

In November when they are finished harvesting their corn:

a. Without Follow-up

If Dec. Futures Are	Value of 2.40 Put	2.40 Put Gain/Loss	Cash Sale Price	Realized Price
\$3.00	\$0.00	-\$0.07	+ \$2.90	= \$2.83
\$2.50	\$0.00	-\$0.07	+ \$2.40	= \$2.33
\$2.00	\$.40	\$.33	+ \$1.90	= \$2.23

b. With Follow-up

If Dec. Futures Are	Value of 2.40 Put	2.40 Put Gain/Loss	Forward Contract Price	Realized Price
\$3.00	\$0.00	-\$0.07	+ \$2.70	= \$2.63
\$2.50	\$0.00	-\$0.07	+ \$2.70	= \$2.63
\$2.50	\$.40	\$.33	+ \$2.70	= \$3.03

**A Portfolio Pricing Perspective**

Keeping markets in perspective by remaining objective and unemotional is of great assistance in successful marketing. This is sometimes easier said than done considering the considerable time, energy and pride that most agricultural producers invest in production. This is true regardless of the considerable amount of money invested.

The worst example of investing too much

attention or emotion on the wrong objective may occur when a producer forward prices a small portion of their crop, say 10 percent. If prices continue to increase after this action and all they can do is "second guess" the 10 percent of production that they have pre-priced, they are concerning themselves with the wrong item. This is true because 90 percent of their production is unpriced and is increasing in value with rising market prices.

An approach can be borrowed from the equity (stock) investment community that should add valuable perspective to your marketing activity. This approach involves viewing your inventory of grain or livestock as a portfolio. Stock portfolio managers for large corporations, pension funds or mutual funds calculate their net market exposure, for example:

1.) Suppose you have pre-priced 100 percent of your grain. Your current risk exposure on your remaining portfolio of unpriced grain production to a market decline is 0 percent and your opportunity for price gains, if prices increase, is 0 percent.

2.) Suppose you have pre-priced 25 percent of your grain. Your risk exposure for your remaining portfolio of unpriced grain, to a market decline, is 75 percent. Your remaining opportunity for price increase gains is 75 percent.

So, you can see that risk and opportunity can be managed in degrees. Forward pricing need not be an "all or nothing" proposition. If a producer feels that some forward pricing is warranted but still wants to take advantage of any possible price gains, partial pricing can be very effective in managing long term financial risks and opportunities. If for instance they are very positive about future prices, but want some protection, they may decide to pre-price 30 percent of their production. This would mean 70 percent of their production is still

exposed to any price declines or price increases. This could be called a 70 percent exposure to future market price changes. Their final average selling price for the year would be:  $.30 \times \text{the price of forward priced grain} + .70 \times \text{the selling price on remaining production}$ . Said another way, a \$.10 per bushel market decline before they sell their remaining grain, will decrease their total grain income \$.07 per bushel. Whereas a \$.10 per bushel market increase will increase their total grain income \$.07 per bushel.

When using options, a producer is able to create differing exposures to price increases than that of price decreases. Purchasing a put option for minimum price protection for instance, would give a 0 percent exposure to price declines and a 100 percent participation in price increases once the premium cost is recovered. If enough put options are purchased to establish a minimum price on one-half of total production, this would result in a 50 percent total exposure to price declines and a 100 percent exposure to price increases after the premium costs are recovered.

### **"Scale Up" and "Scale Down" Strategies**

Many producers have difficulty in attempting to make pricing decisions, when the general trend in prices still appears to be up. Pre-pricing some grain may be a wise long-term financial decision, but you may feel that by doing so, you could miss out on further price increases.

Consider the following suggestions in these market situations. Consider "scaling up" sales in rising market. This will work with any pricing tool and can reduce your anxiety about pricing too soon. Mechanically, you simply sell increasing percentages of your crop at pre-selected prices. As an example, you may have a goal of pre-selling 60 percent of your wheat crop, if favorable prices are available and it appears you will have a normal yield. For instance you may choose to sell 10

percent of your crop a \$3.53 per bushel, 20 percent at \$3.68 and 30 percent at \$3.83. This will weight your final average selling price towards the higher part of the market. Actions should be just the opposite in a long-term declining market. This "scaledown" strategy would require you to sell a higher percentage first, scaled down to the smallest percentage being sold at lower prices.

#### Scaling Up Using Forward Contracts

If you decide to pre-price some grain before harvest, you may want to pre-plan some follow-up decisions. Purchasing call options at the time you forward contract with your grain elevator or afterwards, restores further price increase potential to your market position and effectively converts your fixed contract price to a floor price. This can relieve some anxiety about missing out on price increases without leaving yourself open to the risk of price declines. This also could help protect against losses incurred if yields are less than normal and you cannot fulfill contract commitments. Once you purchase the call option, your minimum selling price will be your forward contract selling price minus the premium you paid for the call option. If prices increase prior to your required delivery date on the cash contract, your net selling price will increase once prices move above the strike price of your call option. You will then sell your call option at an increased value and add the profit from your call option to the forward contract price you receive from your grain elevator.

#### Scaling Up Using Put Options

You can also execute a "scale up" strategy in an uptrending market by purchasing put options. Purchasing a put option gives you a floor price for your grain. Your floor price is equal to the strike price of the put option, minus the premium cost of the option, adjusted for local basis. With this tool you have the opportunity for further price increases. When "scaling up" with put options you

will buy a greater number of options as the market increases. All strike prices will become cheaper as the market increases. So, you will be able to establish higher floor prices for a lower cost as the market trends higher. As a follow-up activity, you will want to "lock-in" a final selling price during or after harvest through cash sales. If your put option has value, sell it back before it expires. If it does not have value, it will simply expire worthless. If prices have declined, your put options will have increased in value. This value added to the final cash selling price of your grain will combine to provide you the higher floor price.

Any of the "scaling up" strategies can be utilized for post-harvest sales of grain also, if prices are still trending upward. Your objective is to price the majority of your grain in the upper portion of an uptrending market.

#### **Developing a Marketing Plan**

A complete knowledge of marketing tools and procedures will not do a producer any good if he does not create a plan for using them.

Without a plan, it is hard to know where you are headed. The plan should be in writing, so that you have a reminder of your goals and objectives. It should be simple, possibly one page, so that you can post it in your office as a reminder and scorecard of your marketing activities. There are some forms standardized available, but you can easily construct your own. It should contain the following essential information:

1. *Production Plan* - how much of each product, corn, wheat, cattle, etc. do you plan to produce for the year.
2. *Break-even Costs* - per bushel or per hundred weight for livestock. You may want to calculate these costs at various yields or rates of gain levels. In addition to total break-even cost (all costs plus labor) you may also want to calculate and lower minimum cash flow required

to pay all cash cost and service long-term debt.

3. *Objectives and Goals* - If the opportunity arises, what are reasonable prices at which to begin forward pricing to lock in profits? What will you do if prices continue to rise? What will you do if prices begin to decrease and look like they will stay lower?
4. *Marketing Tools* - What tools will you use when profitable prices are available? What tools will you use when prices are going lower? What will you do if you don't know which way prices are going, but you want some risk protection? If each of your primary strategies later need modification, which tool will you use to accomplish your goals without adding market risk?
5. *Charts* - It could be helpful to attach a current price chart to your marketing plan, with brightly colored lines marking your various pricing objectives. Possibly, a separate each for your first, second and third profit objectives. You might use red for a minimum cash flow pricing objective for less than favorable markets.
6. *Recording* - Make sure you record the quantity, date and method of pricing on your plan when you do take action.

### **Finding & Selecting A Broker**

Before making a transaction in the futures and options markets, you must contact a licensed (Series 3) brokerage representative and open an account. You will also be asked to provide a certain amount of personal and financial information.

#### Finding a Broker

Because brokerage offices are not located as conveniently across the country as fast food restaurants, some effort is required in finding

a broker. Begin by talking to people you know who are currently using the markets. Lenders and Extension Agents are also good sources of information. In some locations, livestock feed yards serve as introducing brokers (IBS).

Another option is the National Futures Association (NFA), which maintains lists of brokerage firms by geographic area and can tell you whether there are any outstanding complaints against a particular broker. (An address for the NFA is listed at the end of this paper.) Once you've located a broker(s) in your area, set up an appointment with them. You may want to phone or stop by in the afternoon (generally after 2 p.m.) as brokers are busy during market hours.

#### Selecting a Broker

When selecting a broker hopefully you will have a long term relationship with them. Below are some factors and questions to consider when selecting a broker.

It's important that you feel comfortable with the broker you choose) comfortable with them:

- personality
- experience
- knowledge
- services
- commission structure

You may need to contact several brokers before you find one who is right for you.

#### Ask Questions Such As:

- 1.) Is the broker willing to work with an account that will be maintained strictly for hedging purposes?**

Make sure to mention that you wish to open an account strictly for hedging purposes. Some brokers prefer only speculative accounts due to the low volume of trading most hedgers do in a year's time.

**2.) What experience does the broker have with agricultural commodities that you wish to trade?**

You may find in calling around, that some brokerage offices do not deal in agricultural commodities.

**3.) Does the broker have a working knowledge of the fundamentals of the commodities that you wish to hedge?**

If you are looking for a broker to provide price outlook and advice, this will be an important question. Also, find out if the broker is current on the cash market in your area and do they understand the factors that may affect your cash basis (the difference between your local cash prices and futures prices) for any given time of the year.

**4.) How familiar is he/she with hedging and/or options strategies?**

Futures and options hedging strategies can vary from very basic (selling futures and buying put options) to the more complicated (the fence, roll ups, etc.). If you would like to have the opportunity to implement more complicated futures and options strategies into your marketing plan, make sure

the broker you choose has a working knowledge of a variety of strategies and can explain them to you. Be sure to fully explain your objectives so the broker can propose a plan that you will be comfortable with.

**5.) What services does the broker offer and what are the commission fees and margin requirements?**

Ask the broker about commission charges. There are both full service and discount brokerage firms. Generally, discount brokers handle order executions only. As with most businesses, there is usually a volume discount in the brokerage business and commission varies with amount of service.

Each firm has a different policy regarding the margin required to open an account. Minimum margins are set by the individual exchanges and normally run 3 to 18% of a contract's value. Hedgers' margins are lower than speculators' margins because of the differentiation in risk.

Once you've had the opportunity to visit with several brokers, evaluate each one on experience, knowledge, services and costs. And keep in mind that no matter how technically competent a broker may appear to be, or how many services they may offer, you are unlikely to have a satisfactory working relationship unless you feel comfortable with that person.

Source: National Futures Association, 200 West Madison, Chicago, IL 60606, (312) 781-1410

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*Notes...  
Network*

*(For More Information) Contact: **Rod Sharp, Ag. & Business Management Economist CSU Extension, (970) 245-9149, [Rod.Sharp@colostate.edu](mailto:Rod.Sharp@colostate.edu)**  
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