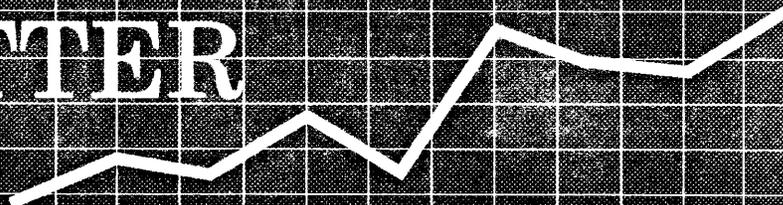


MARKET

NEWSLETTER



Preharvest Pricing Strategies

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Introduction

A previous newsletter (#91-01) examined post-harvest marketing decisions. This issue examines what are for many producers a series of more perplexing questions — whether, when, and how to sell something that they don't yet have. Specifically, should PNW growers consider the preharvest pricing of their growing wheat crop?

As documented in the previous article, average Portland wheat prices have not increased over time. Thus, the wheat producer's objective should be to market the crop in a timely fashion. Postharvest, the interest and storage costs associated with holding grain should encourage the producer to sell sooner rather than later unless there are convincing reasons pointing toward a price increase. Preharvest, the situation is different since producers do not pay holding costs. The impetus to price before harvest is related to the desire to reduce price uncertainty and/or improve returns.

Alternative Marketing Approaches

The critical question is how should you decide when to sell. Four general approaches for formulating marketing strategies are outlined below.

1. **Fixed strategy**— This approach involves establishing a set of actions in advance and following through on them no matter what is occurring in the market. The advantage of this approach to marketing is that the grower removes the influence of emotions from the marketing process. The disadvantage is the inability to react to special situations.

2. **Technical analysis (charting)**— This approach sets marketing actions based on an analysis of primarily short run price movements. Although it is quite easy to define effective trading rules after the fact, it is not clear that technical rules set in advance perform well.
3. **Fundamental analysis**— In contrast with technical analysis, this approach focuses on an analysis of the factors that influence supply and demand for the crop. Although it is clear that supply and demand factors do influence price, the problem with this approach is that the decision maker must forecast what the fundamental factors and their influences on price will be. Other marketers, many of whom have access to better and more timely information, are doing the same thing.
4. **Market imbalance analysis**— This approach is based on the recognition that markets have normal and abnormal price ranges. When markets are in a "normal" range it is difficult to predict their medium term direction. When markets are either above or below the normal range it is possible to predict their likely direction using simple rules of thumb. This approach is called "Back to the Average" or "Reversion to the Mean" and is what I will be presenting here.

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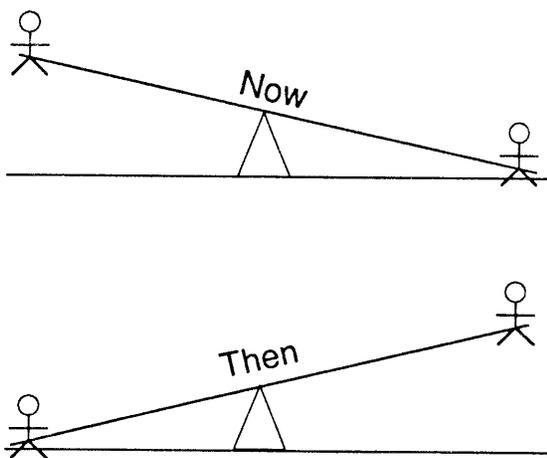
The basic idea behind market imbalance analysis is represented visually by the teeter-totters presented in Figure 1. The lesson written across the bottom of the figure is "What goes up must come down (and vice-versa)." Just as there is only so high that a teeter-totter can go in one direction, there are upper and lower limits for the price of white wheat. It may be difficult for wheat producers to accept the idea that there is an upper limit for wheat prices. It is important for them to separate themselves from what they want to happen and consider instead what is likely to happen.

Over time, what has been observed is that when stocks of wheat become tight and the price of wheat goes up, both domestic and foreign producers respond to the higher price by planting more wheat. In addition, domestic farm programs are often altered to permit more acreage. The result is (assuming normal weather) more production and lower wheat prices in the next marketing year. The teeter-totter goes from up to down. The fundamental factors work in reverse when the price of wheat is low and the teeter-totter is forced from down to up.

As with any historical analysis a potential problem is that a fundamental change in the situation may alter the teeter-totter itself.

Over the past 15 years, the Portland white wheat market has been volatile ranging from a low of \$2.60 to a high over \$5.00. The average price for this period has been quite stable at around \$3.70. You should note the contrast with other price series such as stock market indices that have varied along a positive trend line rather than a fixed point.

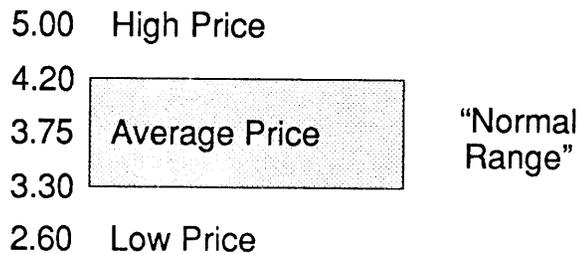
Figure 1



Lesson: What goes up must come down
(and vice-versa)

Figure 2

How High/Low Can the Teeter-Totter Go?



In Figure 2 I have arbitrarily drawn in a normal range of \$3.30 to \$4.20. Within this range the teeter totter is not forced in one direction or the other. Above that range, the expectation is that prices in the next marketing year will be driven down. Below that range, prices will be driven up.

Advantages/Disadvantages of Preharvest Forward Pricing

Now let's move to a discussion of the pros and cons of preharvest forward contracting. The risks involved with preharvest pricing include both production risks and price risks. Many growers are reluctant to promise to deliver a crop until they know for sure that they will have something to harvest. Their reluctance is certainly justified since there is always the chance they will face a double whammy — no crop and large commitments that must be filled with expensive purchased grain.

To avoid a double whammy, the first and most important rule for preharvest forward pricing is to leave an adequate safety margin around what you expect to produce. As an example, if your best guess is a harvest of 20,000 bushels but the crop is not yet "made," and your worst crop (from similar acreage) was 12,000 bushels, you may want to limit yourself to forward pricing something less than 12,000 bushels. By adopting a conservative approach you can avoid the worst-case scenario described above.

An additional negative associated with preharvest contracts is the possibility of a price increase after the price has been established. Although not an out-of-pocket loss, this should be viewed as income foregone.

To counterbalance these two negatives we can list two major advantages that can be gained from preharvest pricing. The first is the advantage of locking in a price and thereby eliminating price uncertainty. By

selling a cash forward contract, you are assured that as long as you produce a crop this is the price you will get. The second advantage to be gained is that selectively forward pricing can improve your returns.

In this analysis I will focus on only two forward pricing alternatives — cash forward contracts and hedging using futures. Both of these alternatives are simpler to implement and have a longer track record than strategies based on options trading.

Using Cash Forward Contracts

The simplest to understand and most widely used forward pricing mechanism is the cash forward contract. When you agree to sell your wheat via a cash forward contract, you are able to lock in a price and transfer the risk of lower prices to someone else. You should expect to pay for this service. In addition, you give up the opportunity of maintaining ownership of the crop after harvest.

Since it is difficult to get historical records for early season new crop forward contracts I will use an example based on forward contracts available the last Thursday in April for the period from 1979 to 1991. For that period, the average April offer was \$3.63 and the average harvest price was \$3.71. The difference of 8 cents can be viewed as the amount paid in order to set

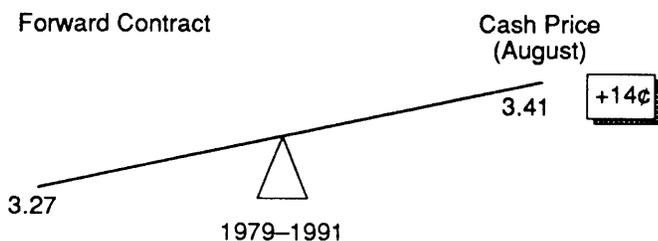
a price in advance. It may be worth your while to pay the 8 cents and fix your wheat price in April.

Following the example of the teeter-totter, it should be possible to set up a rule of thumb that will allow you to selectively take advantage of attractive cash forward contracting opportunities. If the period 1979 to 1991 is split into two categories — years when the April forward contract was below the average level of \$3.63 and years when the April forward contract was above \$3.63, an interesting contrast occurs. As shown in Figure 3, in the low years the average increase in price from the April forward contract to the harvest price is 14 cents (calculated as the average harvest price of \$3.41 minus the average forward contract of \$3.27). In contrast, when forward contracts are relatively high the net loss from forward contracting is only 2 cents (\$4.07 – \$4.05). Thus if we set a simple rule of thumb of cash forward contracting in late April when the price is relatively high and simply waiting to harvest when the price is relatively low, the return would be within 1 cent of the return earned by always waiting until harvest and a substantial amount of uncertainty will be eliminated.

The last two years (shown in Figure 4) provides a pair of excellent examples of these down-to-up or up-to-down patterns of price development. New crop bids during 1989-1990 were above \$4.00 for the November to February period, but then consistently declined and ended at \$3.15 at harvest. In contrast, in 1990-1991 cash forward contracts remained below \$3.00 until March, but subsequently rallied and were above \$3.40 at harvest.

Figure 3

When April Harvest Forward Contract Is Below 3.63



When April Harvest Forward Contract Is Above 3.63

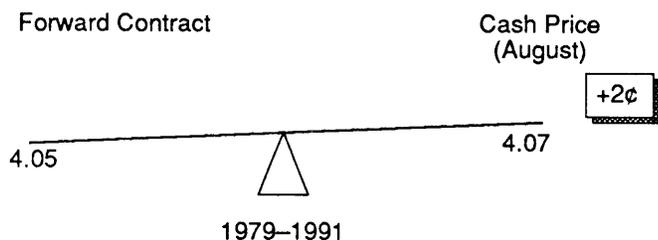
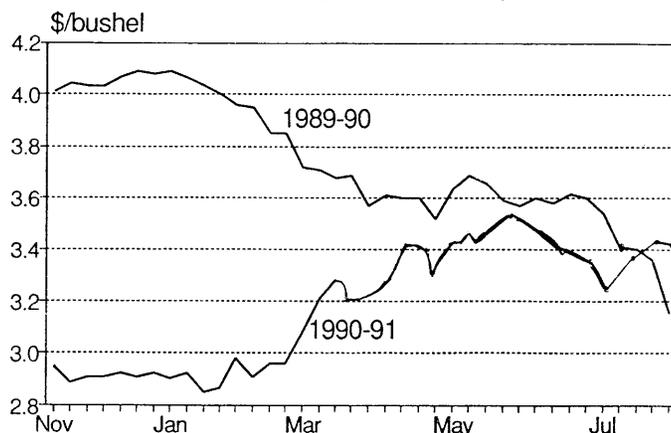


Figure 4

Portland White Wheat 1989-90 & 1990-91 Thursday's August New-crop Bids



In considering harvest cash forward contracts, it is useful to compare the basis being offered (harvest contract – September futures price) with the historical harvest basis. At harvest, the basis averages 28 cents. On average, the preharvest basis offered is only 20 cents. Thus, years such as the current one in which the basis is high (around 45 cents) offer attractive pricing opportunities.

Forward Pricing with Futures

Compared with cash forward contracting, there are two advantages of forward pricing with futures. First, you are not assessed the same sort of fee for fixing your price in advance. Second, you retain the flexibility of maintaining ownership of the crop beyond harvest. The disadvantage of forward pricing with futures is that you can fix only a portion of your price.

The mathematics of setting a hedge with futures is provided below.

Return to Hedge

$$\begin{aligned}
 &= (\text{Futures}_{\text{PRE}} - \text{Futures}_{\text{HAR}}) + \text{Cash} - \text{Comm} \\
 &= \text{Futures}_{\text{PRE}} + (\text{Cash} - \text{Futures}_{\text{HAR}}) - \text{Comm} \\
 &= \text{Futures}_{\text{PRE}} + \text{Basis}_{\text{HAR}} - \text{Comm}
 \end{aligned}$$

where PRE = preharvest

HAR = harvest.

By re-arranging terms it becomes clear what you know and what you are forced to predict when you set a hedge. You know the preharvest futures price when you set the hedge (as an example, the April price for September futures). The part you have to predict is the what the basis (cash – futures) will be at harvest. While the average basis level is well know (28 cents), the variation is wide.

Table 1 provides September futures prices for the last Thursday of each month from October through June. By subtracting the August futures price from the futures price at the time the hedge is set it is possible to calculate the amount gained in a particular year from the futures component of the hedge transaction. That amount is positive for all months and is highest for October and November.

Selective Hedging

If you hedge your growing crop by selling futures in March and buying the same contract back in August, you pocket any *decrease* in price minus commissions. It is important to note that as a wheat producer who will harvest a crop in the late summer, you place yourself in a very different position than someone who simply speculates on market direction. The key is what would happen if the futures market would move against you. For the speculator there would be a loss on the

Table 1. CBT September Futures (last Thursday of the month)

| Year | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | June | Aug* |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1976/77 | 2.965 | 2.86 | 2.89 | 2.935 | 3.0913 | 2.935 | 2.7425 | 2.538 | 2.4850 | 2.2675 |
| 1977/78 | 2.825 | 2.925 | 2.8562 | 2.875 | 2.6975 | 3.0275 | 3.1025 | 3.36 | 3.135 | 3.1275 |
| 1978/79 | 3.38 | 3.26 | 3.28 | 3.225 | 3.31 | 3.28 | 3.4075 | 3.6325 | 4.5150 | 4.145 |
| 1979/80 | 4.69 | 4.6775 | 4.785 | 4.735 | 4.69 | 4.3125 | 4.1875 | 4.3275 | 4.3750 | 4.5625 |
| 1980/81 | 5.45 | 5.4825 | 4.8125 | 4.69 | 4.78 | 4.505 | 4.64 | 4.2825 | 3.9550 | 4.045 |
| 1981/82 | 4.78 | 4.5475 | 4.045 | 4.10 | 3.90 | 3.845 | 3.9825 | 3.6875 | 3.5725 | 3.47 |
| 1982/83 | 3.4575 | 3.74 | 3.565 | 3.635 | 3.605 | 3.845 | 3.7125 | 3.6075 | 3.6025 | 3.775 |
| 1983/84 | 3.62 | 3.52 | 3.535 | 3.40 | 3.29 | 3.4875 | 3.465 | 3.7575 | 3.5475 | 3.4375 |
| 1984/85 | 3.50 | 3.4625 | 3.335 | 3.33 | 3.275 | 3.335 | 3.2875 | 3.2175 | 3.2325 | 2.9125 |
| 1985/86 | 2.92 | 2.83 | 2.915 | 2.745 | 2.58 | 2.535 | 2.535 | 2.595 | 2.52 | 2.6175 |
| 1986/87 | 2.425 | 2.495 | 2.455 | 2.51 | 2.57 | 2.64 | 2.7025 | 2.855 | 2.695 | 2.5925 |
| 1987/88 | 2.92 | 3.00 | 3.0525 | 3.16 | 3.345 | 3.205 | 3.235 | 3.4475 | 3.915 | 3.825 |
| 1988/89 | 3.76 | 3.85 | 3.985 | 4.13 | 4.075 | 4.15 | 4.0725 | 4.025 | 4.0325 | 3.87 |
| 1989/90 | 3.53 | 3.66 | 3.625 | 3.5675 | 3.51 | 3.49 | 3.4225 | 3.3475 | 3.3525 | 2.83 |
| 1990/91 | 2.92 | 2.86 | 2.8025 | 2.7575 | 2.89 | 3.035 | 2.97 | 3.055 | 2.7525 | 2.955 |
| Average | 3.54 | 3.5465 | 3.46 | 3.45 | 3.44 | 3.44 | 3.43 | 3.40 | 3.446 | 3.3625 |
| Std. Dev. | .81 | .80 | .68 | .67 | .66 | .57 | .58 | .54 | .62 | .645 |
| Month – August | 0.1775 | 0.184 | 0.0975 | 0.0875 | 0.0775 | 0.0775 | 0.0675 | 0.0375 | 0.0835 | — |

* 1st Thursday in August of the following marketing year.

Table 2. Selective Hedging Decisions 1976–1991

| Year | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | June | Aug |
|----------------|------|------|------|------|------|------|------|------|------|------|
| 1976/77 | — | — | — | — | — | — | — | — | — | NA |
| 1977/78 | — | — | — | — | — | — | — | — | — | NA |
| 1978/79 | — | — | — | — | — | — | — | H | H | NA |
| 1979/80 | H | H | H | H | H | H | H | H | H | NA |
| 1980/81 | H | H | H | H | H | H | H | H | H | NA |
| 1981/82 | H | H | H | H | H | H | H | H | — | NA |
| 1982/83 | — | H | — | H | H | H | H | H | H | NA |
| 1983/84 | H | — | — | — | — | — | — | H | — | NA |
| 1984/85 | — | — | — | — | — | — | — | — | — | NA |
| 1985/86 | — | — | — | — | — | — | — | — | — | NA |
| 1986/87 | — | — | — | — | — | — | — | — | — | NA |
| 1987/88 | — | — | — | — | — | — | — | — | H | NA |
| 1988/89 | H | H | H | H | H | H | H | H | H | NA |
| 1989/90 | — | H | H | — | — | — | — | — | — | NA |
| 1990/91 | — | — | — | — | — | — | — | — | — | NA |
| Ave. Return | 3.86 | 3.89 | 3.83 | 3.77 | 3.75 | 3.72 | 3.71 | 3.71 | 3.74 | 3.66 |

— = Do Nothing

NA = Not Applicable

H = Hedge with September futures

futures position. In contrast, for the hedger the loss in futures is likely to be offset by a higher harvest cash price. Thus, while a hedging producer would be worse off than one who simply remained unpriced, he/she should still be better off than a speculator.

Slightly better returns can be earned by selectively hedging based upon the level of CBT futures. To be conservative, I selected a rule of thumb that a hedge should be set when CBT September futures are above \$3.60. This resulted in a hedge being set in about 33% of the years. The reason for the attractiveness of selective forward pricing (see Table 2) with futures is the same as shown for cash forward contracting. There are two directions that the general wheat market as reflected by CBT futures can go — up or down. If in the winter the September futures price is lower than the long-term harvest average (that is, lower than \$3.60), then the results here indicate that the price trend is uncertain. In this situation, forward pricing through hedging will *not* provide a greater return than remaining unpriced until harvest. In contrast, when CBT futures are high the likelihood is that prices will fall and you will be able to buy back the futures at a lower price. As mentioned above, the returns are greater the earlier the selective hedge is set.

The relationship here is an interesting one. In each of the months examined, the rule of thumb suggests hedging in about one out of three years. For the 30% to

40% of the time that the hedge is suggested, the return is quite reliably positive. For the other 60% to 70% the average return is almost exactly zero with wide swings between strongly positive and strongly negative returns. The bottom line is that a strategy of *always* hedging provides almost the same average return as selective hedging. This is quite different from the conclusion we reached for postharvest hedging where there is a major improvement in returns from selective as compared with every-year hedging.

In order to remain conservative I would still suggest following a strategy of selective hedging rather than every-year hedging. There is a greater likelihood that the returns to selective hedging when future prices are high will continue to be positive. The returns to every-year hedging may be an aberration that will disappear.

The market imbalance analysis described here provides two key discoveries. First, selective hedging and/or forward contracting can raise average returns and reduce price uncertainty. Second, the earlier in the season that the producer is willing to preharvest forward price with futures, the greater is the expected return that can be earned.