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Matthew Diersen

South Dakota State University, Matthew.Diersen@SDSTATE.EDU

Scott W. Fausti

South Dakota State University

Emmanuel Opoku

South Dakota State University

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Considerations When Marketing Commodities

Far Ahead of Harvest

By Matthew A. Diersen, Scott W. Fausti, and Emmanuel Opoku¹

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Department of Economics
South Dakota State University
Brookings, SD 57007

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¹ Diersen is a Professor and Wheat Growers Scholar in Agribusiness Management, Fausti is a Professor and Mr. Opoku is a Research Associate in the Department of Economics at South Dakota State University.

Considerations When Marketing Commodities Far Ahead of Harvest

Crop and livestock producers face a complex challenge when marketing. High commodity prices give a strong incentive to sell, price, or protect revenue far ahead of the traditional cash sale date. However, high and volatile input costs such as rent, fertilizer and feed work against locking in a profit. What follows is a general overview of preliminary material for a series of workshops and programming.

The outline of the document and workshops is similar. At the beginning of the workshops (or components) we ask a series of questions of participants. We provide the general format of those here. Then we cover the incentives to market far ahead of harvest or of the typical cash transaction period. The primary marketing strategy discussed is “rolling” of nearby to deferred contracts in a variety of settings. Input risks are then covered as costs may not be fixed at the same time that output prices may be fixed. Finally, we discuss constraints or limitations based on available insurance coverage and overall risk.

Preliminary Questions

On average, are forward prices more favorable than final spot prices?

Have you wanted to price a commodity far ahead in recent years, but have been unable to do so?

What percent of key outputs do you prefer to have hedged or priced prior to harvest?

What percent of key inputs do you prefer to have hedged for priced prior to marketing?

Have you ever rolled a contract ahead?

Do you have a brokerage account?

If yes, do you have a distinct line of credit for margin needs?

What is your key input risk?

Have you considered or purchased pasture insurance in the past three years?

How does insurance influence the level producers are able to hedge or price?

Are you willing to price any portion of a crop before buying crop insurance?

Incentives to Market

Profit is easy to measure once business activity happens. Take total revenue, subtract total cost and the remainder is profit. It is easy to forecast profit by looking at revenue and cost projections. Once you mix in forecast errors and the ability to lock in price levels the picture becomes less clear.

A few years back we made the observation that it was possible for farmers to market like never before. More futures contracts months were listed and more volume was traded. If someone wanted to hedge it was getting easier to manage and the price levels were attractive. The financial crisis interrupted the trend, but volume has begun to increase again.

Consider the situation in early January of 2012 (Table 1). Producers could have used futures to price corn and soybeans out to the new-crop contracts of 2015. For live cattle, a producer could probably hedge a new born calf to finish in April of 2013. Then, things get a little more complicated. Feeder cattle could only be (easily) priced out to November of 2012, not even as far out as oats. Wheat presents other challenges. New crop 2014 can be priced using the Chicago market. However, specific winter wheat contracts are only available until December of 2013 in Kansas City and spring wheat contracts are only available until March of 2013.

Table 1. Most deferred contracts trading on January 3, 2012

Chicago Corn	Chicago Soybeans	Live Cattle	Feeder Cattle
DEC15	NOV15	APR13	NOV12
Minneapolis Wheat	Kansas City Wheat	Chicago Wheat	Chicago Oats
MAR13	DEC13	JUL14	DEC12

Sources: CME Group, Minneapolis Grain Exchange, Kansas City Board of Trade

The incentives to hedge far ahead of a cash transaction date can be great. High levels of revenue can be locked in which can in turn help assure profit. Futures prices across delivery months and delivery years can be lumpy or move together. Thus, a short crop may drive up futures prices for nearby and distant delivery. As farms and ranches continue to get larger there has been increased interest in marketing more or some of the production farther out to spread risk and take advantage of price incentives. Anecdotal evidence may support pricing in hindsight.

There is evidence that the higher overall prices, increased aggregate production levels of major crops, and greater market volatility have lead producers to use forward contracts, futures contracts, and options contracts with greater frequency. Based on survey results from the Economic Research Service, MacDonald and Korb report significant increases in uses of all types of contracts by producers of major crops (Table 2).

Table 2. Percent of production of selected commodities under contracts.

Year	Corn	Soybeans	Wheat	Cattle
2005	19.6	18.4	7.5	17.6
2008	26.1	25.1	22.5	29.4

Source: MacDonald and Korb (2011)

Similarly, with market demand any contracts of interest would be expected to be listed on the exchange. Because so many months and contract years are now listed, it seems reasonable to wonder if there are any problems pricing commodities far ahead.

The other side of the profit equation is also pushing some producers to look at hedging output. Ever-higher cash rents and spiking input prices such as fertilizer squeeze profit from the cost

side. If costs are locked in or committed to, it may be necessary to try to lock in output prices to again help assure profit.

A couple of trends concern risk managers. The first trend is to only partially hedge vulnerable aspects of profit. It was quite common last year to visit with cattle feeders that had locked in the price to be received for fed cattle with others that had locked in the cost of corn. However, less common was the feeder that locked in both. Some were open to corn price risk; others to fed cattle price risk; others to feeder cattle price risk. On the crops side, the same type of vulnerability existed before land and fertilizer costs were known or realized, limiting the amount of grain pricing that occurred. The second trend is over-hedging, which usually happens unintentionally. Over-hedging occurs when new crop contracts are entered into before planting is physically completed. Producers are vulnerable to the limitations of prevented planting coverage. Some regret may also accompany over-hedging. In hindsight the hedging was too aggressive for the risk tolerance of the hedger.

Marketing Strategies

Most producers are familiar with a hedging strategy to price commodities. A producer that will ultimately sell a commodity in the spot or cash market can price ahead by entering a forward contract or selling a futures contract. Delivery completes the forward contract and buying the futures contract back completes the hedge effort.

The standard advice when hedging is to use the contract month that matches up with the spot month when the crop is harvested or the livestock are ready for sale. As long as a futures contract is listed or a forward bid is available, there is little problem pricing a commodity. When the desired month is not yet listed or liquid enough to obtain an acceptable price, a hedger faces the

challenge to either wait or try another marketing strategy. A common way around a contract that is not listed yet is to use one that is available and at a later time roll the contract to the desired month.

What specifically is rolling? First, a position must be in place. For most producers, a short position, where a futures contract is sold would be the most common starting point. The position is bought back while simultaneously selling a more deferred contract.

Lock and Roll Case

Consider a common strategy of hedging new crop wheat, then rolling into a storage hedge. The process begins in February of 2012. The producer considers forward pricing the spring wheat crop that will be harvested in August. To hedge the crop, he uses the 2012 MGEX September spring wheat contract. The futures contract is trading at \$7.70 per bushel. The same contract is used to determine the price election for crop insurance. The producer expects basis at harvest to be \$-0.50, or 50 cents under the futures price at harvest. The producer thus expects to sell wheat in the cash market in August for \$7.20 per bushel. To guard against a possible decrease in price, he hedges the wheat by selling September futures at \$7.70 per bushel. This locks in the price.

On August 15, the producer's crop is harvested. He harvested slightly above his expected yield. The futures price has fallen to \$7.50, but not enough that he expects any indemnity payment. The basis has widened out to \$-0.60. At this point, the producer could lift the hedge, gaining \$0.20 on the futures position. He could also sell the crop in the spot market for \$6.90 per bushel. He would not receive the expected price of \$7.20 because of the wider basis.

The producer also has storage space and observes carry the market with the March 2013 contract trading at \$7.85. He expects basis in March to improve to \$-0.30. He decides to store wheat. The

producer could still lift the original hedge, gain the \$0.20, and wait until March to sell for an expected price of \$7.55. The market could decline before March, so the producer decides to ROLL the September position forward to a March position.

The September position is bought back at \$7.50 and the March position is sold at \$7.85. In March of 2013 the basis has improved to \$-0.30 and the futures price has fallen to \$7.75. The producer is satisfied with the returns, sees no more carry in the deferred contracts and expects no more basis improvement. He lifts the March futures position, gaining \$0.10. He also sells in the cash market receiving \$7.45. His final returns before storage costs would be: \$7.75 (0.20+0.10+7.45).

Other Roll Scenarios

There are several more complicated scenarios, each with their own set of issues to consider when placing, rolling, and lifting the positions. Consider a cow-calf producer expecting calves to be born in the spring of 2012. The producer is also expecting to background the calves until March of next year. Thus, in January of 2012 the producer would ideally be able to price the backgrounded cattle against the March 2013 feeder cattle futures or options contract. There is no guarantee that the available price level would either be desired, profitable, or a related options strategy be cost-effective. That is a separate issue. The immediate problem is that the feeder contracts are generally not listed and/or traded that far ahead.

Livestock producers have similarly been frustrated by the duration or length of coverage available on livestock insurance products. Livestock Risk Protection (LRP) is tied to trading options contracts, and limited liquidity often means that a desired end date of coverage is not listed. This shortcoming is common across classes of livestock. Livestock Gross Margin

insurance suffers from similar limitations on the duration of the end date available. Instead of rolling, one would more likely protect the livestock in stages. For example, LRP could be purchased on calves with a specific end date. Then LRP could be purchased on feeder cattle as they are backgrounded. Finally, LGM could be purchased on fed cattle as the feeder cattle enter a feedlot.

Input Costs and Risk

The key input risk faced by producers depends highly on the commodity being considered. For a crop farmer with only owned land, maybe fertilizer is the only input that has fluctuated significantly in recent years. A cow-calf producer with leased pasture may want to select multiple answers.

One reason to identify a key input risk is simply to narrow the range of inputs that may need additional management resources. The other reason is to better understand how that key input may affect marketing and insurance decisions. High enough input risk may lower the optimal marketing amount or make insuring the input a necessary cost to consider. Here we consider a wheat case and a cow-calf case to see how input risk may influence marketing and a pasture case to value insurance. For all cases, simulations were run using Simetar software.

Wheat Case

The Economic Research Service (ERS) provides a database of annual cost and returns for various commodities over several years. The first case is wheat for the Northern Great Plains region of the U.S. This region would include much of South Dakota. The example is chosen as a general guide on assessing the risk from price and yield variability in the region. A producer can then model the same impacts on an enterprise at the farm level.

The historic costs and returns are available in a consistent format from 1998-2010. Revenue is driven by wheat harvested for grain and some earlier contributions from straw sales. Primarily, however, price and yield dictate revenue. Major variable costs include fertilizer, chemicals, repairs, seed and fuel. Major fixed costs include capital recovery of machinery, a land charge, a labor charge, and general farm overhead allocated to the enterprise.

Historic prices and yields are modeled and used to forecast prices and yields for 2011-2013. The ERS provides baseline cost estimates for the same time frame. The forecasted yields and given cost estimates are used to project profit levels. We treat 2011 as a calibration year, because even though it is past the relative changes are still instructive to monitor. The final step is to determine how vulnerable expected profit levels are to shocks or to sensitivity analysis of total crop costs. These are stated in a probability framework.

Cow-Calf Case

The second case is for a cow-calf enterprise for the Northern Great Plains. The ERS provides costs and returns on a consistent basis from 1996-2010. Revenue is driven by a combination of calf sales, some yearling sales, and some cull-cow turnover. We are not using all of the costs as recorded. The values for overhead and unpaid labor seem unrealistic relative to accepted norms in the region. Thus, we elected to only use feed costs and other operating costs for this analysis.

The major feed costs are harvested feed and grazed feed. The ERS baseline includes a minor explicit opportunity cost of land. The majority of land charge comparable to cropland would be encompassed by the feed cost categories above. For example, the grazed feed would be equivalent to a rental rate on pasture. The major other costs are fuel, repairs, cattle for backgrounding, and veterinary expenses.

The historic revenue, feed cost and other operating cost levels are modeled and used to forecast each variable for 2011-2013. The ERS does not provide any cost estimates for this timeframe. Thus, 2011 is again a calibration year for reference purposes and shows how the parameters would have changed following trends. The final step is to determine how expected profit levels vary under changing revenue and cost scenarios.

Grazing Case

The third case is for pasture or rangeland. We know of no consistent data set that measures the available and harvested forage in a pasture setting. However, as a proxy we use hay yield variability. In general as hay yields fluctuate so would grazing yields. Again, the idea is to demonstrate how to go about assessing the risk from an input.

The South Dakota statewide all hay yield from NASS is used to develop a forecast of yield levels and yield variability. We also use the historic grazing fee rate for a cow-calf pair for South Dakota to develop a forecast of the price of an AUM. The result is a distribution of the value of grazing production on a per cow-calf pair basis. The distribution is used in a discussion of profitability and the value of different levels of insurance.

A final consideration is to see if a risk premium to cover input cost risk is necessary to add onto any price targets for outputs.

Constraints and Limitations

While the incentives to forward price exist we have already discussed how input risk may temper the amount that may be optimal to commit on the output side. There are additional considerations, mainly tied to crop insurance, that often act as constraints. The type of crop

insurance, level of coverage, and timing of insurance parameters work together. They may constrain when and how much is prudent to market and dictate the types of tools necessary to implement sound strategies.

Marketing objectives are important to consider. There may be an optimal or target level to try to price prior to harvest. Consider the shares under contract for those willing to contract wheat in 2008. According to MacDonald and Korb (2011), over 26 percent of farms with contracts had 21-40 percent of their production under contract. At the same time, about 24 percent of farms with contracts had 81-100 percent of their production under contract. The latter figure may seem aggressive, but it could easily be complete coverage by the most risk-averse producers.

Crop Insurance Highlights

Is there always a clear incentive to price far ahead? Consider a recent look at winter wheat (Table 3). The price discovery period for winter wheat insurance uses the average in late August and early September of the following year's KCBT September HRW contract. Insurance settles based on the July average of the same contract right before harvest. Thus, one place to look for an incentive is to consider the likelihood and level of price declines. With hindsight, the price declined in 2007 and 2009, but it increased in the other years.

With any pricing or hedging, it is important that crop insurance be considered. For background information on insuring wheat see Diersen (2012). The most common type of insurance product used on corn, soybeans, and wheat is Revenue Protection (RP). Having insurance with a harvest price increase feature, such as on RP, is essential to guard against price increases on any unharvested, but priced bushels. The other primary consideration is the coverage level or yield

election level chosen for a given type of coverage. Depending on the crop year coverage levels from 65-75 percent have been common.

Table 3. Recent Winter Wheat Discovery Period Prices (\$/bushel)

	2007	2008	2009	2010	2011
Projected Price	6.33	5.88	8.77	5.42	7.15
Harvest Price	6.06	8.43	5.57	5.85	7.57

Source: RMA and KCBT

Another general consideration when looking at crop insurance is the basis at harvest. Basis is the difference between a cash price and a futures price. Crop insurance harvest prices settle or use the average of new-crop futures prices in the month or two prior to the contract expiration month. Spring wheat, for example, settles to the August average of the September MGE contract. Winter wheat settles to the July average of the September KCBT contract.

Limitations of Insurance

With only yield insurance, there would be risk that for bushels not produced yet hedged the futures price could increase. If that happens hedging losses could exceed the crop insurance indemnity payment as the price election on yield insurance does not change. Thus, matching the product type is important. An insurance deductible is also naturally built in and limits what percent of the crop can be prudently hedged. The current policy coverage levels range from 50-85 percent on corn, soybeans, and wheat in South Dakota.

Common advice is to limit hedging to the coverage level. Basis risk, however, can be substantial and would suggest that the coverage level serve more as an upper bound than a heuristic.

Knowing basis levels to expect at harvest helps for planning. Knowing the full range helps to limit over-hedging and sets up for potentially profitable rolling strategies should storage be a possibility. Prevented plant limitations may also greatly reduce the prudent hedge level. Finally, even with the best product type when hedging, RP, the harvest price is capped at 200 percent of the projected price. Thus, with aggressive hedging, producers should explore making covered sales.

Summary

While this is not an exclusive set of considerations it captures the scope of what has been discussed by producers, academics and industry. The workshops will provide additional insights into the practical implications when marketing commodities far ahead of harvest.

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