UNIVERSITY OF NEVADA •Reno

COOPERATIVE EXTENSION

Bringing the University to You

Fact Sheet-05-35

Managing Market and Price Risk in Agriculture: The Case for Forward Contracts

Kynda R. Curtis, Assistant Professor and Extension Specialist, Department of Resource Economics, College of Agriculture, Biotechnology, and Natural Resources, University of Nevada, Reno

Marketing Alternatives

There are many marketing alternatives available to agricultural producers today. Options include spot market sales, forward contracts, basis contracts, and hedging by way of futures and options contracts. Due to market fluctuations and producer individual risk preferences, the preferred marketing choice can be a difficult and complex decision process. Markets fluctuate from year to year and, in some cases, within one growing season. Markets are determined by many factors, including consumer preferences, and growing conditions, as well as international factors such as trade policy and competition. Additionally, as each marketing alternative has its own risks and returns, a producer's willingness to take risks and the ability of the operation to survive an unfavorable outcome constrains the number of viable marketing alternatives.

In other words, a marketing alternative must be appropriate for the individual producer. When selecting a marketing strategy, the producer should evaluate each alternative in terms of net return, income variability, and level of risk (Patterson and Makus, 1999). Risk tolerance varies greatly among producers and is primarily a determinate of the producer's age, preferences for risk, equity in the farming/ranching operation, previous financial commitments, past financial experience, and the size of the potential gain or loss.

Spot Markets and the Marketing Process

Spot market sales are generally considered easy as they have many advantages including the lack of storage costs, interest charges, and complete producer management freedom. However, spot market sales expose the producer to more risks. That is, the producer has no guaranteed buyer, nor is the market price known until auction. Hence, there always exists the possibility of having to sell the product below the cost of production or storing the product for later sale.

As marketing is the process of determining the appropriate product, mix of products, and/or product characteristics for a predetermined customer base, spot market sales do not adhere to what are considered "good" marketing practices; the process in which market information is incorporated into the product choices before planting and not left to chance after harvest. Hence, forward contracts may provide a vehicle for managing market and price risk for many producers. In fact, contract production shifts nearly 97% of the market and price risk from producers to intermediaries in the broiler industry (Knoeber and Thurman, 1995).

Potential Benefits of Forward Contracts

Potential producer benefits from forward contracts include, but are not limited to, market security, income stability, access to capital and technology, and improved production efficiency. For example, processors monitor producers through on-site visits from field personnel. Field personnel provide producers with important information concerning expected yields and technical processes. Experts suggest that the majority of the productivity gains of contracted producers in the hog industry were due to knowledge transfers from processors to

producers (Key and McBride, 2003). Hence, these field personnel are generally not regarded as spies, but rather interventionists should the producer need assistance in preventing crop damage. However, if field personnel feel the producer is not being sufficiently diligent, he/she may discuss non-renewal or breech of contract implications with the producer (Wolf *et al*., 2001). Forward contracts almost always specify a buyer, quantity, and price for the producers yield. The buyer, often called the "contractor," is likely a processor, distributor, or other middleman. Contracts are usually entered into before planting.

If the producer is aware of customer quality and quantity preferences, he/she can make the appropriate production decisions and decide which management strategies will yield the highest expected profit. Additionally, as the sale price is specified in the contract, the producer can evaluate the potential returns from the contract, as well as estimate the cash flow before he/she enters into the contract. Hence, if the contract does not cover production costs and/or provide an appropriate return to assets and producer labor/management, the producer may decide to reject the contract.

Contractors also benefit from the use of forward contracts through input supply control ("just in time" production), input quality control, improved efficiency, and improved ability to respond to customer preferences. For example, in the processed potato industry, processors require a steady supply of high quality potatoes to ensure their production goals. High quality potatoes allow the processor to reduce costs and increase production, which naturally leads to increased profits.

Types of Forward Contracts and Specifications

Contracts are normally written by the contractor (processor, wholesaler) and represent the perspective and interest of the contractor. While contracts differ greatly across industries, there are several elements which are normally included. A detailed description of contract terms may resemble the following:

Contract Length: Contract length differs across crops and livestock type. It can range from one growing or calving season to multi-year agreements. Although producers may want extended contracts in order to repay facility investments, an extended contract may expose the producer to additional risk. Market and industry conditions change and an extended contract may keep the producer from accepting more advantageous opportunities in later years, or subject the producer to inflationary factors that may decrease the value of the contract over time (Martin, 1999).

Conditions for Delivery: For many crops, an exact quantity, usually in terms of weight, may be specified along with an option for the contractor to purchase more if desired. For livestock a range of weight gain and/or the number of livestock is specified. Additionally, a range of delivery dates, as well as delivery equipment is specified. For processing potatoes, for example, contractors require that potatoes be delivered in trucks with wood or rubber beds in order to reduce bruising. In some cases, if the crop is not delivered to the contractor by a certain date, the contractor may reserve the right to harvest the crop and charge the cost of harvest to the producer. If the contractor is responsible for transportation, a range of pick-up dates may also be specified.

Payment Determination: The contract will state the terms of payment (30, 60, or 90 days) and payment structure in terms of base and bonus payments. In other words, how is "quality" defined and what are the bonus payments/penalties for each level of quality? For example, in the processed potato industry, potatoes with higher specific gravity are well formed, smooth, and firm. Every .005 increase in specific gravity[1] will increase the number of potato chips that can be processed from 100 pounds of raw potatoes by one pound (Gould,

[1] The specific gravity is the solid content of the potato, measured as the ratio of weight in air to weight in water and greater than 1.000, the specific gravity of water.

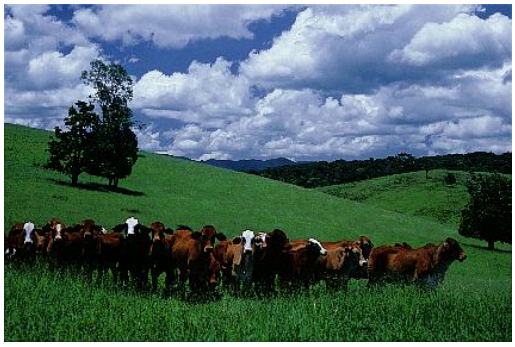
1999). It is important that bonus payments are determined by factors in which the producer has control; otherwise, there is no incentive for the producer to use effective management or production practices that positively influence product quality. Additionally, the producer may be exposed to risk if he/she is penalized for poor quality as a result of events in which the producer had no control. Performance standards in forward contracts take either a relative performance or an absolute performance structure. A relative performance structure measures producer performance against his/her peers (other producers under contract). An absolute performance structure measures producer performance against contract standards. The following are examples of absolute performance producer payments:

- Producer payment = (base + bonus/penalty)* non-culls + culls*cull price
- Producer payment = $.10*(pounds gained) + feed conversion bonus + mortality bonus

Management/Production Practices: In production contracts, the contractor may participate in making management decisions and/or require the producer to adhere to specified production practices. Examples might include planting certified seed or applying USDA approved pesticides/herbicides. Forward contracts usually take the form of either a marketing contract or a production contract. Marketing contracts differ from production contracts in that they do not specify management practices.

Party Responsibilities: The responsibilities of each party should be clearly outlined in the contract. For example, in livestock production, the contract should specify which party supplies the major inputs, as well as which party is responsible for loading and unloading livestock, carrying insurance on livestock and/or facilities, manure management, and the disposal of dead animals (Martin, 1999).

Conditions for Contract Termination or Renewal: The contract should provide provision for contract renewal and termination, including the term of notice required.



Contract Evaluation Process

Before entering into a contract, a producer should take steps to evaluate the contract and the contractor. A detailed description of suggested steps is provided below.

Research Contractor Finances and Request References*:* Upon entering a forward contract, the producer becomes a business partner with the contractor as he/she is now vertically coordinated with the contractor. Hence, the producer must decide if he/she wishes to do business with the contractor. Considerations might include, the contractor's position and reputation in the community or industry, the satisfaction other producers have had with the contractor and the contract itself, as well as the contractors financial position (Martin, 1999). Is the contractor financially viable? Will the contractor be in business in 5, 10, or 20 years?

Evaluate Financial Aspects of the Contract*:* A forward contract will only be advisable if the producer can make money in the contract. The producer should develop an enterprise budget and cash flow statement for the first year of production based on yield and quality expectations. Does the contract provide an appropriate return to assets and producer management and labor?

Simulate Best and Worst Case Scenarios: As yield and quality expectations are essentially a best guess, often based on past experience, 5 or 10 year averages, and other factors, the financial outputs created through the use of expectations are only as good as the information behind them. Hence, producers should simulate best and worst case scenarios, often called sensitivity analysis. What are the expected profits from the contract if yield

and/or quality values fall 20% below expectations or 20% above expectations?

Seek Legal Council: As contracts are in most cases legally binding, producers should have legal council review the contract and assess any potential legal risks.

Potential Drawbacks to Forward Contracts

Due to the quantity specifications in forward contracts, producers may find that they are subject to production risk, the risk of not fulfilling the contract due to unexpected yield shortfalls. In many contracts the producer will be excused from timely delivery in the case of special circumstances, such as weather damage. However, the producer may not be excused unless the contract specified a geographic area of production (McEowen, 1999).

A second drawback is the potential loss of producer freedom in management. Farmers and ranchers are known for their independent spirit and the high value they place on running their own agricultural operation. The influence of a third party into this process may decrease the producer's quality of life.

A third possible drawback is the ratcheting of quality levels or bonus payment for certain quality levels from one contract period to the next. As contractors are able to gage producer performance at the end of the first contract period, there is incentive for the contractor to only contract with superior producers in the second contract period, as well as decrease bonus payments to certain quality levels (Curtis and McCluskey, 2004).

References

Curtis, Kynda R. and Jill J. McCluskey. "Incentives for Quality and Ratcheting in the Processed Potato Industry." NAES working paper #51053389, 2004.

Gould, Wilbur A. *Potato Production, Processing, and Technology*. Maryland: CTI Publications, 1999.

Key, Nigel and William McBride. "Production Contracts and Productivity in the U.S. Hog Sector." *American Journal of Agricultural Economics* 85, no. 1 (2003):121-133.

Knoeber, Charles R. and Walter N. Thurman. "Don't Count Your Chickens...:Risk and Risk Shifting in the Broiler Industry." *American Journal of Agricultural Economics* 77 (1995):486-496.

Martin, Laura L. "Navigating Production Contract Arrangements." Staff Paper 99-10, Department of Agricultural Economics, Michigan State University, 1999.

McEowen, Roger A. "Legal Issues Involving Cash Forward Grain Contracts." Kansas State University publication, 1999. Online. Available at http://www.oznet.ksu.edu.

Patterson, Paul E. and Larry D. Makus. "Tools to Manage Price Risk in Grain Marketing." Ag Communications publication 10-99, 1999.

Wolf, Steven, Brent Hueth, and Ethan Ligon. "Policing Mechanisms in Agricultural Contracts." *Rural Sociology* 66, no. 3 (2001):359-381.