



**BUSINESS
MANAGEMENT
IN AGRICULTURE**

A joint project of the Cooperative
Extension Service, Farm Credit and
Chicago Mercantile Exchange

Managing price risk

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Acknowledgements:

Oklahoma State University Media for providing video
footage of agricultural operations.

Minneapolis Grain Exchange, Minneapolis MN for the
location of "Using agricultural futures."

Managing price risk

Managing price risk



Rob King



John Ikerd

This is one module of the *Business Management in Agriculture* series and is intended to be used with its corresponding videotape. The script may vary from the actual videotape text.

Robert King is an associate professor in the Department of Agricultural and Applied Economics at the University of Minnesota where he holds the E. Fred Koller Chair in Agricultural Management Information Systems. Prior to coming to Minnesota in 1983, he taught at Colorado State University for four years.

King has a B.S. degree from Yale University and M.S. and Ph.D. degrees in agricultural economics from Michigan State University. Risk management has been an important focus of his research and teaching.

John Ikerd is a professor and head of Extension Agricultural Economics at the University of Georgia. He worked as an Extension economist in livestock marketing for seven years in North Carolina and eight years in Oklahoma before moving to Georgia in 1984. His entire professional career has been spent working with farmers on their management and marketing problems.

Ikerd was raised on a small dairy farm in southwest Missouri. Upon completion of a B.S. degree at the University of Missouri in 1961, he worked with Wilson Foods in merchandising and sales promotion. He returned to the University of Missouri in 1965 where he completed M.S. and Ph.D. degrees in agricultural economics.

Purpose

The purpose of this module is to help you:

1. understand the nature of price risks that are inherent in markets for agricultural commodities, and
2. gain an understanding of how you can use scenario analysis and forward contracting to manage the risks you face in the marketplace.

Videotape script

By Rob King and John Ikerd

Fred— As a lender, I recognize that risks and uncertainties are an unavoidable part of farming and ranching. Farmers and ranchers must manage risks if they are to survive and prosper. In this video module, Rob King and John Ikerd will discuss price risk and explore some strategies that can be used to manage risks in the marketplace.

We want to help you understand first, the nature of risks that are inherent in agricultural markets, and second, how one familiar marketing tool, forward contracting, can be used to manage market risks. The use of other marketing tools, such as futures and options contracts, are introduced in other tapes so we will not deal with them here.

Our purpose is to help you overcome some of the feeling of helplessness you saw expressed by Sandy and Clay.

Clay— And farmers can't set prices like other businesses can. We have to take whatever the market offers.

Sandy— We have to decide what to produce without even knowing what we will get for it. How can you run a business under those conditions?

Clay— I simply don't see how you can produce for the markets when you don't know what the prices are going to be until harvest time.

Sandy— We do look at alternatives to marketing...

Clay— But I'm not going to put my money in the pit with those speculators in Chicago by trading futures or options. I get as much as I can out of what I produce. I still don't see much use of developing pricing objectives when we can't set prices.

Fred— As I deal with the credit needs of producers, I can tell you these feelings are shared by many farmers and ranchers as they market their products. Gentlemen, let's see what we can do to help them by looking at the nature of risks in agricultural markets. Rob, what is risk?

Definition of risk

Rob— Fred, I'd start by saying risk is the chance of an unfavorable or undesirable outcome. In farming, poor yields, low product prices, and high input costs are some of the major risks that managers face. These are all unfavorable things that farmers and ranchers would like to avoid.

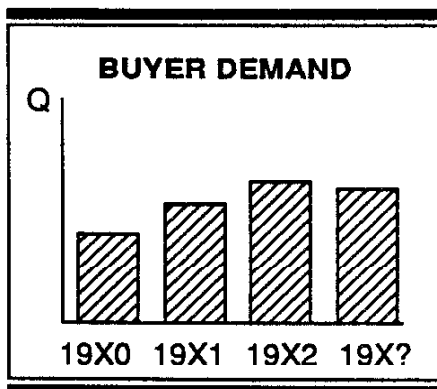
John— So when we're talking about managing risks, we mean strategies that will allow farmers and ranchers to reduce the odds or chances of something bad happening. In other words, coping with the possibilities of unfavorable outcomes or results.

Rob— That's right, but it's important to keep in mind that when we face risks, we're not sure what will happen. Managers who are willing to accept risks also may be rewarded by the opportunity to realize more favorable results. So as managers work toward reducing risk, they

RISK IS:

Chance of unfavorable or undesirable outcomes such as:

- Poor yields
- Low prices
- High input costs



should also try to maintain some chance to benefit from favorable events.

John— Sure, they could reduce the risks of poor yields by not planting anything. But they have to produce something or they will eliminate any chance of making a profit in the process of eliminating the risks of loss.

Rob— And, if they produce something, they have to sell it. That forces them to deal with price risks—the chance or risk of unfavorable market prices.

Fred— I think most farmers and ranchers understand that markets for most farm commodities are inherently uncertain. How did Sandy say it?

*Sandy— How can we produce for the market?
There is no way we can know at planting or breeding time whether or not prices will be profitable at harvest time or when we have hogs to sell.*

Fred— Gentlemen, aren't we dealing with supply and demand here?

Rob— Fred, we know prices depend on supply and demand. On the supply side, we're never sure what the overall supply of a crop will be before it's planted or even while it's still growing. The same is true of livestock. We don't know how many animals will be coming to market at any given time even if we know how many are on farms or in feedlots today. Price forecasters have to contend with uncertain weather, imperfect supply information, and unpredictable farmers and ranchers in making their supply estimates.

John— The demand side isn't a whole lot easier even though demand does tend to be a little more stable than supplies. Now we know how much buyers have been willing to pay for various quantities of things in the past. That gives us some insights into what they may be willing to pay in the future. But people aren't machines. Therefore, they aren't always predictable; tastes change, incomes vary, new markets may open up. You're never sure just how much they will be willing or able to pay for something at a given time in the future.

Rob— The bottom line is that supply, demand and prices for farm commodities are difficult to predict accurately. Some of the possible prices are almost always unfavorable. So farmers and ranchers, in general, face significant risks due to the possibility of unfavorable market prices.

Fred— So what you're saying, Rob, is that there is very little an individual farmer or rancher can do to change the

basic nature of the markets. And you're also saying that risk management is not a matter of finding someone who knows what prices are going to be.

John— Right, no one knows. But even though we can't know exactly what prices will be, it's still important for managers to understand how prices are determined and the range of possible prices they face in the marketplace.



Setting up scenarios

Rob— I agree, John. One exercise I've found to be especially useful in helping managers think about prices and price risk is to define from three to five possible scenarios. Each scenario begins with a description of market-related events such as drought or normal weather and ends with an assessment of what the price would be under each condition. I call it scenario analysis.

Fred— Rob and John, how about an example to show how scenario analysis can work?

Rob— Okay, the logical place to begin is with a clear definition of what price we're talking about. That means specifying the commodity, time of delivery and the market.

John— Okay, Rob, let's say it's early June and we plan to sell a group of feeder steers four months from now. In this case, we may be concerned with the price of 600- to 700-lb. feeder steers delivered in October to a nearby feedlot.

We can use the forward contract price currently offered by a large feedlot as a reference point for thinking about price risk. Let's say the feedlot is offering forward contracts that pay \$73 per hundredweight (cwt.) for cattle of the type we expect to deliver in October.

Rob— Now let's identify the market factors that are likely to affect feeder cattle prices between now and October. Fed cattle prices would certainly be one factor. If they go up, the demand for feeder cattle will be stronger and feeder cattle prices also are likely to rise.

John— Prices of feed would also affect feedlot demand and ultimately affect the price for feeder cattle. If feed prices rise, the cost of feeding cattle goes up. And cattle feeding profits will drop unless managers are able to offset rising feed costs with lower priced feeder cattle. Higher feed costs usually mean lower prices for feeder cattle.

In addition, local weather and pasture conditions may affect the local supply which also affects the local price of feeder cattle. If the local cattle supply is down, feeder cattle prices may go up.

SCENARIO ANALYSIS

<u>Market description</u>	<u>Price</u>
1. Drought— widespread	\$4.00
2. Drought—local	\$2.30
3. Normal—local	\$3.95
4. Normal— widespread	\$2.25

PRICE FACTORS

1. Commodity
2. Time of delivery
3. Market
4. Price

SCENARIO ANALYSIS	
<u>Market description</u>	<u>Price</u>
1. Fed cattle down/ feed up sharply	\$65
2. Fed cattle/feed stable; normal weather	\$75
3. Feed down/ fed cattle up	\$85

Developing price scenarios

Rob— Now we can develop some price scenarios based on these factors. Let's start with a pessimistic scenario. It's October, fed cattle prices for next spring are expected to be lower. Feed prices have risen sharply, perhaps due to increased export demand for feed grains. These developments have weakened demand and the local feeder cattle price has fallen to \$65/cwt.

John— Okay, Rob, now I'll take an easy scenario, the one where things turn out about as expected—no unexpected moves in fed cattle prices or feed prices, and local weather conditions have been normal through the summer. October feeder cattle prices under this scenario are \$75/cwt., two dollars higher than the current forward contract price.

Rob— Why did your expected scenario come out with a price higher than the contract price?

John— Those who offer forward pricing contracts take on price risks that farmers and ranchers are trying to avoid. They are willing to take those risks only if there is some offsetting benefit such as a lower average purchase price over the long run.

Rob— Now let's add an optimistic scenario, better than average growing conditions nationally have caused feed grain prices to fall. Fed cattle prices are expected to be stronger next spring. Feedlot managers are expanding the number of cattle on feed, and that bids feeder cattle prices up sharply to \$85/cwt. in October.

John— These three scenarios are summarized in Appendix 1 (p. 13) of the study materials. You'll be studying them in a moment. It's important to remember they are only three out of a wide range of possible events and price levels. But they do give us a good idea of the price risks we are facing.

Rob— That's right, John, and as we use these scenarios to think about ways to manage that risk, it's important to remember that we can't choose a most favorable scenario or even know in advance which one will actually occur. Often we can make judgments about which scenarios are more likely and which are less likely. We may even assign probabilities or odds to alternative scenarios. But we are still not certain which will occur at a given time.

Fred— We'll stop the videotape now so you can preview Appendix 1 in your study materials. Review the steps we've done to this point. I'd recommend you look at Exercise 2 and try your hand at defining your own scenar-



ios for a commodity price that will affect profits in your operation. We'll be back in a few minutes.

(pause)

Fixed-price forward contracting

Fred— Welcome back, gentlemen. I talk to a lot of farmers and ranchers and I study price risks. In doing so, I sense that, at least in the foreseeable future, farm and ranch managers will be facing significant risks associated with uncertain market prices.

John— I couldn't agree with you more, Fred, but managers can do some things to manage price risk even though they can't control or accurately forecast prices.

Rob— Right. A good example is fixed-price contracting. Farmers and ranchers are more likely to have used fixed-price forward contracts than any other marketing tool. A fixed-price contract is a mutual commitment between a producer and buyer of a commodity. The producer agrees to deliver a specified quantity of the commodity on a particular date. The buyer agrees to pay a prearranged price.

John— In effect, this removes all price risk for the quantity contracted. The risk is shifted to the cattle feeder in this case. No matter how much prices rise or fall, the farmer or rancher with this kind of contract gets the same guaranteed price.

Fred— John, why don't you return to your feeder cattle example and the price scenarios you've developed? We can use them to take a closer look at how farmers and ranchers can use fixed-price forward contracts to reduce price risks.

John— Okay, Fred, if we don't contract at all and sell our feeder cattle at delivery in October, the price we receive will vary from one scenario to another. It may be as low as the \$65/cwt. in Scenario 1 or as high as the \$85/cwt. in Scenario 3. You'll recall that under normal conditions, or Scenario 2, we would expect \$75/cwt. So we face the full range of price risk from \$65/cwt. to \$85/cwt. and, of course, we can't know in advance which scenario will actually occur.

Rob— On the other hand, if we contract all our production at the current forward contract price of \$73/cwt., we will receive that price at delivery no matter which scenario actually occurs. We have completely eliminated price risk.

FIXED-PRICE CONTRACT

Mutual commitment:

- Producer delivers specified amount of commodity on a specific date
- Buyer pays a prearranged price

Fred— But farmers or ranchers don't have to contract all their production, do they?

Rob— Of course not. They don't have to make an all-or-nothing decision about fixed-price contracts. In fact, farmers and ranchers often forward contract less than their expected production because they are uncertain about production levels. They don't want to be committed to deliver more than they can produce. Also, by contracting only part of what they expect to produce, farmers or ranchers can choose how much or how little they reduce their price risks.

Weighted average prices

John— Farmers or ranchers who contract part of their production end up receiving an overall price that is a weighted average of the contract price and the cash delivery price. The weights are the fractions of the contracted and not contracted production.

Fred— I sense we need another example, gentlemen.

John— Okay, let's take a look at the case where we contract half of our expected feeder cattle production. We'll calculate the weighted average of the contract and cash prices for each scenario. In this case, the weight placed on each price will be one-half.

Rob— In Scenario 1 the overall price is one-half (or 50%) of the contract price of \$73/cwt., plus one-half (or 50%) of \$65/cwt., the cash price, for an average price of \$69/cwt.

John— In Scenario 2, where the cash price at delivery is \$75/cwt., we have 50% of \$73/cwt., plus 50% of \$75/cwt., giving us an overall price of \$74/cwt.

Rob— In Scenario 3, it's 50% of \$73/cwt. plus 50% of \$85, or \$79/cwt.

We can summarize this in a table that compares the contract and cash prices to our final average price in each scenario. The lesson learned is that by contracting half of our expected production, we eliminate some but not all of our price risk. For example, the range between the lowest and highest possible prices narrows from \$20/cwt. (\$65 to \$85) with no contracting to \$10/cwt. (\$69 to \$79) when we contract half of our expected production.

Fred— What happens when more or less than 50% is contracted, John?

John— In a minute we'll be looking at Appendix 2 (p. 14) where we've worked out overall prices for strategies in which 25% and 75% of expected production is contracted.

50% CROP FORWARD CONTRACTED

	Scenario		
	1	2	3
	(\$/cwt.)		
Contract price	\$73	\$73	\$73
Cash price	65	75	85
Avg. price	69	74	79

Rob— As you might expect, the more you contract, the more your price risk is reduced.

John— Appendix 2 is summarized in the chart to the right and is helpful for showing how farmers and ranchers can choose their level of price risk exposure by varying the percentage of their production they contract. Options are 0%, 25%, 50% and 75% contracted. The colored portion of each bar, representing our three scenarios, shows the lower and upper bounds on the overall average price or ranges of risk.

On the left side of the chart, farmers or ranchers who contract little or nothing are exposed to the entire range of price risks from \$65 to \$85, or a \$20 range. To the right side, those who contract all or nearly all their production face little or no price risk, in this case \$71 to \$75 for a range of \$4. That's a big reduction in risk.

Fred— So what does this represent in the way of advice for farmers and ranchers?

Rob— Simply that farmers who choose a strategy somewhere in the middle can reduce their downside risks considerably while retaining some opportunity to take advantage of price increases. They also reduce the chance of being committed to deliver more than they are able to produce.

John— Let's stop the tape now to give you an opportunity to review Appendix 2.

Fred— We have also prepared Exercise 3 that will give you a chance to use the price scenarios you developed in Exercise 2 to analyze how forward contracting will affect price risk for a commodity important in your production area. We'll be back in a minute.

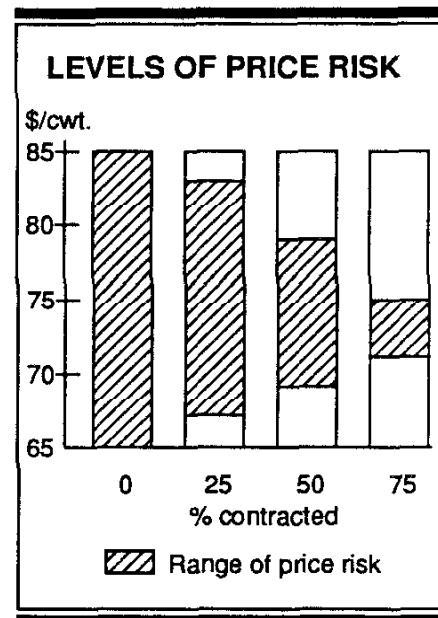


(pause)

How much risk is right for you?

Fred— Rob, we've seen that by varying the percent of expected production that is priced with a fixed-price forward contract, a manager can effectively choose a level of price risk. How does a manager decide on an appropriate level of risk?

Rob— Fred, there's no single "right" answer. A manager's decision about the use of fixed-price contracts depends on the attractiveness of the contract opportunity and on willingness and ability to bear risk.



COST OF FORWARD CONTRACTING

Managers sacrifice the chance of higher prices

NET PROFIT

Price	\$75
Minus cost	-70
Profit	5
$\$5/\text{cwt.} \times 300 \text{ cwt.} = \1500	

John— Reducing risk almost always comes at a cost. A farmer gives up the chance of higher prices in order to avoid the risks of lower prices.

Rob— It's sort of a trade-off, isn't it? Those farmers who contract must decide whether the risks of lower prices are more important than the possibilities of higher prices.

John— Exactly.

Rob— There are some things we can do to make that trade-off more clear. So far we've only considered price risk. But we know that we care about prices because they affect overall income.

Fred— Can you pick up on your feeder cattle example one more time to show how you can convert beliefs on price risk into information on income risk?

Rob— Let's try, Fred. To do that, we'll need to know how many feeder cattle we plan to sell and what it costs us to raise them.

John— Let's say we plan to sell 50 feeder steers in October at a weight of 600 lbs. That makes our total production 30,000 lbs., or 300 hundredweight. Regarding production costs, our records and current budget projections indicate that it will cost \$70/cwt. to raise the steers.

Fred— If you know what the price will be, figuring your net income on this group of steers is easy. It's just the difference between the price and production cost multiplied by total production, right?

John— Right, Fred. For example, if the price is \$75/cwt., and the cost is \$70/cwt., we'll make a profit of \$5/cwt., or \$1,500 for the entire group of steers.

Rob— Of course, we don't know what the price will be. But for a contracting strategy we can calculate net income for each scenario. We've done that and summarized the results in Appendix 3 (p. 15).

Fred— This table has a lot of information on it. I think we need some explanation, John. First, where did the prices come from for calculating net income?

John— We used the overall prices from Appendix 2. For example, you'll recall in Scenario 1 the overall price is \$69/cwt. when 50% of expected production is contracted. That means that with a production cost of \$70/cwt. we lose \$1/cwt. on 300 hundredweight, or \$300. On our summary table, we see that loss reflected.

Rob— Right, John. And in the "contract 100% strategy," the price will always be \$73/cwt., the contract price. That

means that with a production cost of \$70/cwt., we lock in a profit of \$3/cwt. by contracting. With 300 hundredweight of production, we always make \$900, as noted again in Appendix 3.

John— In that case, we are certain of a profit. But we miss out on the chance to make much bigger profits if the market price at delivery is high, as it is in Scenario 3, where we saw a price of \$85/cwt. as you will recall.

Rob— Again, it's important to remember that we cannot choose a scenario. That's beyond our control.

Managing risk with management objectives

John— But we can choose a strategy for managing the risks we face. That's the key to effective risk management. This is where management objectives become very important. If it is important that we make at least \$900 on these cattle, we would likely contract all of them to lock in a \$73/cwt. price.

Rob— But if we could afford to take the risk of losing \$300 under Scenario 1, we might contract only 50%. That would give us \$1,200 under Scenario 2 and the chance for \$2,700 under Scenario 3.

John— It all depends on the individual situation. How much risk are you willing and able to take? How much profit do you have to have to meet your objectives?

Fred— Before I ask Rob and John to summarize the issues covered in this tape, it would be well to stop the tape for a few minutes to allow you to review the net income levels for our feeder cattle example found in Appendix 3.

Once you understand how the net income levels were calculated, decide which strategy you would choose. If there are others taking this course, you may want to compare your choice to that made by others in your group, but don't feel obligated to do so. Remember, there is no single strategy that is right for everyone.



(pause)

Summary

Fred— John and Rob, it's now time to summarize the issues. Why don't you lead off, John?

John— In this module we have tried to help you understand the nature of the price risks that are inherent in agricultural markets. We began by defining risk as the

chance of an unfavorable outcome—an unfavorable price in the case of market risk.

Rob— We then developed several market scenarios to help illustrate why many different future price outcomes are possible in a particular market situation.

John— Finally, we showed how one familiar marketing tool, fixed-price forward contracts, can be used to change the risk you face in the marketplace, thereby managing the price risk you face.

Rob— Other modules in this series introduce two additional marketing tools—futures contracts and commodity options. These offer still greater flexibility for managing price risk. Good luck in your marketing endeavors.

References

- Ikerd, John E. 1988. *Individual Farmer Marketing Strategies*, Bulletin 980, February, Cooperative Extension Service, The University of Georgia, Athens, Georgia.
- King, Robert P. and David D. Johnson. 1988. "Forward Pricing Alternatives for Grain in a Drought Year." *Management Responses to the Drought*. AG-MI-3585, Department of Agricultural Economics, Minnesota Extension Service, University of Minnesota, St. Paul, Minnesota.
- Tierney, William I., Jr. 1987. "Pre-Harvest Marketing Alternatives." Staff Paper No. 87-3, February, Department of Agricultural Economics, Kansas State University, Manhattan, Kansas.
- Tierney, William I., Jr. 1987. "Post-Harvest Marketing Alternatives." Staff Paper No. 87-4, April, Department of Agricultural Economics, Kansas State University, Manhattan, Kansas.

Appendix 1

Price scenario work sheet

Price scenarios for:	<u>Feeder cattle</u>	
Delivery location:	<u>Centerville Auction</u>	Delivery date: <u>October</u>
Product specifications:	<u>Medium frame No. 1 600 – 700 lb. steers</u>	
Base or contract price:	<u>\$73.00</u>	
Key market forces		
	<u>1. Fed cattle prices</u>	
	<u>2. Feed prices</u>	
	<u>3. Local weather and pasture conditions</u>	
	<u>4.</u>	
Price scenarios	Market events	Market price
Scenario 1	<u>1. Higher-than-expected feed prices</u>	<u>\$65/cwt.</u>
	<u>2. Falling fed cattle prices</u>	
Scenario 2	<u>1. Normal crop-growing conditions</u>	<u>\$75/cwt.</u>
	<u>2. Fed cattle and feed prices are at expected levels</u>	
Scenario 3	<u>1. Excellent crop-growing conditions</u>	<u>\$85/cwt.</u>
	<u>2. Low feed prices</u>	
	<u>3. Rising fed cattle prices</u>	
Scenario 4	<u></u>	<u></u>
Scenario 5	<u></u>	<u></u>

Appendix 2

Price scenario analysis work sheet

Scenario analysis for:	Feeder cattle		
Delivery location:	Centerville Auction	Delivery date:	October
Product specifications:	Medium frame No. 1 600 – 700 lb. steers		

	Scenario				
	1	2	3	4	5
Market price	\$ 65.00	\$ 75.00	\$ 85.00	_____	_____
Contract price	73.00	73.00	73.00	_____	_____
Strategy	Overall or average unit price				
1. No contracting	65.00	75.00	85.00	_____	_____
2. Contract 25%	67.00	74.50	83.00	_____	_____
3. Contract 50%	69.00	74.00	79.00	_____	_____
4. Contract 75%	71.00	73.50	75.00	_____	_____
5. Contract 100%	73.00	73.00	73.00	_____	_____

Appendix 3

Net income scenario analysis work sheet

Scenario analysis for:	Feeder cattle		
Delivery location:	Centerville Auction	Delivery date:	October
Product specifications:	Medium frame No. 1 600 – 700 lb. steers		
Expected production:	300 cwt.	Unit production cost:	\$70/cwt

	Scenario				
	1	2	3	4	5
Market price	\$ 65.00	\$ 75.00	\$ 85.00	_____	_____
Contract price	73.00	73.00	73.00	_____	_____
Production cost	21,000	21,000	21,000	_____	_____

1. Multiply expected production by the appropriate overall or average unit price from the price scenario analysis work sheet to calculate gross revenues.

Strategy	Gross revenues (\$)				
1. No contracting	19,500	22,500	25,500	_____	_____
2. Contract 25%	20,100	22,250	24,900	_____	_____
3. Contract 50%	20,700	22,200	23,700	_____	_____
4. Contract 75%	21,300	22,050	22,500	_____	_____
5. Contract 100%	21,900	21,900	21,900	_____	_____

2. Subtract the production cost from each gross revenue to calculate net income levels.

Strategy	Net income (\$)				
1. No contracting	-1,500	1,500	4,500	_____	_____
2. Contract 25%	-900	1,250	3,900	_____	_____
3. Contract 50%	-300	1,200	2,700	_____	_____
4. Contract 75%	300	1,050	1,500	_____	_____
5. Contract 100%	900	900	900	_____	_____

Exercise 1

Video questions

Indicate whether each of the following statements is true (T) or false (F).

- T F 1. Risk is defined as the chance or probability of an unfavorable outcome or result.
- T F 2. A farmer or rancher's primary risk management objective should be to totally eliminate risks, if at all possible.
- T F 3. Fixed price forward contracts eliminate price risks, but also eliminate the potential for prices higher than the contract level.
- T F 4. The advantage to a producer of forward cash contracting is that it removes all of the price risk for the quantity contracted.
- T F 5. One reason many farmers or ranchers do not forward cash contract is because they are afraid of crop reduction or failure in which case they would be unable to deliver the quantity contracted.
- T F 6. As a farmer or rancher increases the percentage of his/her crop that is forward contracted, he/she sacrifices chances to benefit from higher-than-expected prices.
- T F 7. The demand side of the supply-demand equation is typically a little easier to predict because we know historically how much buyers are willing to pay for various quantities of things.
- T F 8. The secret to managing price risk is to find someone who knows what prices are going to be in the future.
- T F 9. Price forecasting is a very exact science.
- T F 10. Scenario analysis is a technique to help producers think about risk management in a systematic way.
- T F 11. When assessing future market events and prices through scenario analysis, you must describe all possible scenarios in order to successfully predict the price risk you face.
- T F 12. Once you have defined the scenarios, the secret of good management is to pick the scenario that you want to happen.
- T F 13. Hedging in the futures market is the most commonly used tool that farmers and ranchers currently use for dealing with price uncertainty.

Exercise 2

Defining price scenarios

Your task is to define from three to five possible price scenarios for a commodity that is important to you. There are no right or wrong answers on this exercise. Your scenarios should reflect what *you* believe could happen to prices. Use the following five steps and complete the work sheet on page 18.

1. Identify the commodity, market setting and delivery time.
2. Determine some kind of base price level or contract price.
3. Identify market factors that will affect this price level and describe the effect of each.
4. Define three to five scenarios.
5. Determine a possible cash price level of each scenario.

Price scenario work sheet

Price scenarios for: _____		
Delivery location: _____	Delivery date: _____	
Product specifications: _____		
Base or contract price: _____		
Key market forces		

Price scenarios	Market events	Market price
Scenario 1	_____	_____

Scenario 2	_____	_____

Scenario 3	_____	_____

Scenario 4	_____	_____

Scenario 5	_____	_____

Exercise 3a

Calculating overall or average unit prices

Calculate the following weighted averages of contract and cash prices.

Market price	Contract price	Percentage contracted	Overall or average unit price
\$65.00	\$73.00	50	_____
75.00	83.00	40	_____
1.65	1.75	35	_____
4.25	3.50	80	_____
54.00	65.00	72	_____
3.00	2.75	65	_____
83.00	72.00	75	_____
83.00	72.00	55	_____
83.00	72.00	30	_____
83.00	72.00	10	_____

Exercise 3b

Scenario analysis of fixed-price contracting strategies

Your task is to determine your overall or average unit price in each scenario for a range of fixed-price contracting strategies. This will give you information that will be useful in choosing a marketing strategy that is right for you. Use the scenarios you defined in Exercise 2. Use the following five steps:

1. Identify several contracting strategies (defined by percent contracted) that you want to evaluate.
2. Review the cash or market price levels for each scenario.
3. Review the contract base price of the commodity in question.
4. For each strategy, calculate the overall or average unit price.
5. Analyze the results.

Price scenario analysis work sheet

Scenario analysis for:	_____	
Delivery location:	_____	Delivery date: _____
Product specifications:	_____	

	Scenario				
	1	2	3	4	5
Market price	_____	_____	_____	_____	_____
Contract price	_____	_____	_____	_____	_____
Strategy	Overall or average unit price				
1. No contracting	_____	_____	_____	_____	_____
2. Contract 25%	_____	_____	_____	_____	_____
3. Contract 50%	_____	_____	_____	_____	_____
4. Contract 75%	_____	_____	_____	_____	_____
5. Contract 100%	_____	_____	_____	_____	_____

Exercise 4

Net income scenario analysis of fixed-price contracting strategies

Your task is to determine your net income in each scenario for a range of fixed-price contracting strategies. This will give you information that will be useful in choosing a marketing strategy that is right for you. Use the scenarios you defined in Exercise 2 and the overall prices calculated in Exercise 3. Use the following four steps and complete the work sheet on page 22.

1. Determine the level of price risk.
2. Determine the level of production and per unit cost of production.
3. Calculate gross revenue and net income for each scenario and summarize in a table.
4. Select the final strategy by comparing income figures with your price or management objective.

Net income scenario analysis work sheet

Scenario analysis for: _____	
Delivery location: _____	Delivery date: _____
Product specifications: _____	
Expected production: _____	Unit production cost: _____

	Scenario				
	1	2	3	4	5
Market price	_____	_____	_____	_____	_____
Contract price	_____	_____	_____	_____	_____
Production cost	_____	_____	_____	_____	_____

1. Multiply expected production by the appropriate overall or average unit price from the price scenario analysis work sheet to calculate gross revenues.

Strategy	Gross revenues (\$)				
1. No contracting	_____	_____	_____	_____	_____
2. Contract 25%	_____	_____	_____	_____	_____
3. Contract 50%	_____	_____	_____	_____	_____
4. Contract 75%	_____	_____	_____	_____	_____
5. Contract 100%	_____	_____	_____	_____	_____

2. Subtract the production cost from each gross revenue to calculate net income levels.

Strategy	Net income (\$)				
1. No contracting	_____	_____	_____	_____	_____
2. Contract 25%	_____	_____	_____	_____	_____
3. Contract 50%	_____	_____	_____	_____	_____
4. Contract 75%	_____	_____	_____	_____	_____
5. Contract 100%	_____	_____	_____	_____	_____

Answer key 1

Video questions

Indicate whether each of the following statements is true (T) or false (F).

- T F 1. Risk is defined as the chance or probability of an unfavorable outcome or result.
Comment: True. This is the basic definition of risk. Price risk is the chance or probability of an unfavorable price.
- T F 2. A farmer or rancher's primary risk management objective should be to totally eliminate risks, if at all possible.
Comment: False. Total elimination of risks may also eliminate any potential for profitability. The primary risk management objective is to achieve a reasonable level of profit at an acceptable level of risk.
- T F 3. Fixed price forward contracts eliminate price risks, but also eliminate the potential for prices higher than the contract level.
Comment: True. Farmers or ranchers with fixed-price contracts get the same price regardless of market prices at time of delivery.
- T F 4. The advantage to a producer of forward cash contracting is that it removes all of the price risk for the quantity contracted.
- T F 5. One reason many farmers or ranchers do not forward cash contract is because they are afraid of crop reduction or failure in which case they would be unable to deliver the quantity contracted.
- T F 6. As a farmer or rancher increases the percentage of his/her crop that is forward contracted, he/she sacrifices chances to benefit from higher-than-expected prices.
- T F 7. The demand side of the supply-demand equation is typically a little easier to predict because we know historically how much buyers are willing to pay for various quantities of things.
- T F 8. The secret to managing price risk is to find someone who knows what prices are going to be in the future.
Comment: False. No one knows what prices will be—not even the experts.

- T (F) 9. Price forecasting is a very exact science.
Comment: False. Price forecasters have to deal with uncertain weather, imperfect supply information, and unpredictable producers in making their supply estimates so it can never be an exact science.
- (T) F 10. Scenario analysis is a technique to help producers think about risk management in a systematic way.
- T (F) 11. When assessing future market events and prices through scenario analysis, you must describe all possible scenarios in order to successfully predict the price risk you face.
Comment: False. You cannot possibly include all events and price levels. A few select scenarios will give you a good idea of the kinds of possibilities you are facing.
- T (F) 12. Once you have defined the scenarios, the secret of good management is to pick the scenario that you want to happen.
Comment: False. The best you can do is to make judgments about which scenarios are most likely and which are least likely to occur.
- T (F) 13. Hedging in the futures market is the most commonly used tool that farmers and ranchers currently use for dealing with price uncertainty.
Comment: False. The most common marketing tool is forward cash contracting.

Answer key 3a

Calculating overall or average unit prices

Calculate the following weighted averages of contract and cash prices.

Market price	Contract price	Percentage contracted	Overall or average unit price
\$65.00	\$73.00	50	\$ 69.00 $(0.5 \times 65) + (0.5 \times 73)$
75.00	83.00	40	78.20 $(0.6 \times 75) + (0.4 \times 83)$
1.65	1.75	35	1.69 $(0.65 \times 1.65) + (0.35 \times 1.75)$
4.25	3.50	80	3.65 $(0.2 \times 4.25) + (0.8 \times 3.50)$
54.00	65.00	72	61.92 $(0.28 \times 54) + (0.72 \times 65)$
3.00	2.75	65	2.84 $(0.35 \times 3) + (0.65 \times 2.75)$
83.00	72.00	75	74.75 $(0.25 \times 83) + (0.75 \times 72)$
83.00	72.00	55	76.95 $(0.45 \times 83) + (0.55 \times 72)$
83.00	72.00	30	79.70 $(0.7 \times 83) + (0.3 \times 72)$
83.00	72.00	10	81.90 $(0.9 \times 83) + (0.1 \times 72)$