

Pricing Georgia Farm Products Through the Futures Market

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Georgia grain and livestock producers can do one of two things when pricing their products: take what the market is offering when they are actually ready to deliver their products, or lock in a price sometime before delivery. Forward pricing (pricing before delivery) is an alternative producers should consider either to lock in acceptable profits, make management decisions, or perhaps even to secure financing. In a farming age of extreme price volatility and large debt requirements, most farm managers need the security of one or more of the advantages offered by forward pricing.

This publication explains one of the two ways Georgia producers can forward price. It is an "introductory" text to help farmers understand the futures market and how they can use the futures market to price agricultural commodities.

Cash Contracts vs. Futures Market Pricing

For producers who want to forward price, two basic options exist: forward pricing through cash contracts and forward pricing directly through the futures market. Producers have commonly used cash contracts. A past survey found that only about five percent of all farmers use the futures market directly. Why is this? Are cash contracts that much better than the futures market? Probably not. The real reason most likely lies in a lack of knowledge.

Before discussing in detail what the futures market is and is not, let's take a brief look at the advantages and disadvantages of forward pricing in the futures market vs. forward pricing through cash contracts.

Perhaps the most important point to keep in mind when discussing cash contracts and the futures market is that each time a contract is offered to a producer, someone up the marketing chain is making that contract available by using the futures market. Because of this fact, cash contracts at any point in time will usually be less in price than will a forward price in the futures market. By using a cash contract, we are paying someone else to forward price in the futures market for us.

Another advantage offered by using the futures market vs. contracts results from the added marketing flexibility offered through the futures market. You can offset your contract at any time. This means you do not have to deliver on the futures contract. With cash contracts you are locked into delivering the amount of product at the price specified. This can create problems when crops fail to meet contracted levels or when potentially profitable prices must be passed up because of the fear of over contracting.

Further marketing flexibility is offered through the futures market because prices can be fixed without the commitment to deliver at a specific location. This lets producers "shop around" for even higher prices when they are ready to actually make delivery on the product. In effect, you separate "when you price" from "where you market." The producer maintains ownership of the commodity but has it priced. This may be of particular importance to producers who have few contracts available or have reason to question the financial stability of the contractor.

For grain producers, further flexibility can be found for producers who have limited storage and multiple crops to store. A producer who grows both corn and soybeans, but has storage for only one crop, may wish to forward price both crops during the growing season. However, if the

producer uses cash contracts he would be obligated to deliver. By using the futures market the producer can still forward price, but reserve the flexibility to store the crop with the greatest storage profitability.

Finally, the futures market may be the only forward pricing alternative available for many products. This is particularly true of livestock producers. Few forward cash contracts are available for cattle and hogs. Producers who wish to forward price have no choice but to use the futures market.

Of course, all is not gold in the futures market. Some of the disadvantages include the necessity of putting up margin money (good faith money required in order to trade futures contracts), the complexity of the market, and the knowledge required to trade contracts. Another disadvantage is the inability to lock in an exact price (the price relationship between futures and cash markets, called basis, will fluctuate within a small range making a precise determination of forward prices offered impossible). Also, many producers desire to price less than the minimum standard contracts called for in futures markets. An example of this problem would be the producer with less than 1,000 bushels of grain (smallest grain futures contract) or 15,000 pounds of hogs (smallest hog futures contract).

Regardless of the disadvantages of futures trading or of the actual use on the part of farmers, the importance and need for the futures market has been well demonstrated. Because of its role in commodity marketing, all producers should learn more about the futures market and its potential use.

What Is the Futures Market?

Futures markets are not new. Organized trading on commodity futures exchanges goes back more than 100 years. Yet futures markets are among the least understood of American institutions.

What is this long-enduring, yet controversial, market? It is simply a "market" in which prices are established for commodities that will be delivered at some time in the future. For instance, prices are now being established for hogs which will not be delivered until 12 months from now. The same is true for corn, soybeans, cattle and a multitude of other commodities.

Futures prices can be interpreted as today's consensus of what prices will be in the future. However, the actual price of the commodity will not be known until it is being traded. For instance, the market estimates what hogs will be next October when the actual supply and demand for hogs determines the price.

Some people have suggested that without the futures markets, prices would somehow be higher. Somehow or another speculators are always driving prices down. However, the fact remains that, with or without the futures market, prices are going to be determined by the forces of supply and demand. Nothing would change about today's price of corn, soybeans, hogs or cattle if the futures markets were eliminated. Producers would, however, lose their only tool to lock in prices for these commodities before actually delivering them. Because of this, prices would most likely be lower since marketing firms would want larger margins to compensate them for the risk of handling unpriced commodities.

At any rate, we are reminded daily about this market through price quotations. No other market in the world has more publicized price information than the futures market. We can get current price reports through the World Wide Web (WWW). Radio stations commonly report prices, and

many government and farm groups in the state have provided taped recordings on toll free numbers of futures prices. Some of the most complete price reports available to all of us come from newspapers, such as the *Wall Street Journal*.

What Is Traded in the Futures Market?

We've stated what the futures market is and how to interpret futures market prices -- but how do we actually get these prices? Simply stated, futures prices represent the current estimated value of a contract for future delivery.

A futures contract is a firm commitment to deliver or receive a specified quantity and quality of product during a specific month in the future with price being determined by public auction at the commodity exchanges.

The essentials of this definition need to be clarified: First, a futures contract is a firm commitment. It is a legally binding commitment, as legal as any contract you may sign. It's an agreement, if you are the seller, to deliver the product represented by the contract. If you buy a contract, you have agreed to accept delivery of the product. This obligation can be fulfilled in either of two ways: by actual delivery or acceptance of delivery, or by taking an offsetting position in the futures market. For example, if you sold a July corn futures contract, your contract obligation can be met by a later purchase of a July contract or by delivery on the original contract. Most traders make offsetting futures transactions. Only a very small percentage of the commodities sold by futures contracts is ever delivered.

Each of the futures contracts represents a specific quantity of product to be sold. In the case of most grains, 5,000 bushels is one contract unit. In hogs, it is a 40,000 carcass weight pound contract for delivery or about 210 to 220 head of market hogs. (See page 4 for a complete listing of the important specifications for most of the agricultural futures contracts.) Product quality or grade is also specified in the contract so the contract price represents a specific quality of product to be traded.

Delivery time is another essential ingredient of the futures contract. The quoted prices represent prices to be paid for products delivered during the month designated for the contract being traded.

Other Trading Facts and Figures

Exchange	Commodity	Trading Months	Trading Hours (Central Time)	Contract Size	Price Quoted in	Minimum Price Fluctuation	Value Per Point	Daily Limit	Trading Range
Chicago Board of Trade www.cbot.com	Wheat	Mar/May/ Jul/Sep/Dec	9:30-1:15	5,000 bu.	<u>&cent;/bu.</u>	1/4 <u>&cent;</u>	1/4 <u>&cent;</u> = \$12.50	20 <u>&cent;</u>	40 <u>&cent;</u>
	Corn	Mar/May/ Jul/Sep/Dec	9:30-1:15	5,000 bu.	<u>&cent;/bu.</u>	1/4 <u>&cent;</u>	1/4 <u>&cent;</u> = \$12.50	12 <u>&cent;</u>	24 <u>&cent;</u>

	Oats	Mar/May/ Jul/Sep/Dec	9:30-1:15	5,000 bu.	<u>&cent;/bu.</u> 1/4 <u>&cent;</u> 1/4 <u>&cent;</u> 10 <u>&cent;</u> 20 <u>&cent;</u> = \$12.50		
	Soybeans	Jan/Mar/ May/Jul/A ug/ Sep/Nov	9:30-1:15	5,000 bu.	<u>&cent;/bu.</u> 1/4 <u>&cent;</u> 1/4 <u>&cent;</u> 30 <u>&cent;</u> 60 <u>&cent;</u> = \$12.50		
	Soybean Meal	Jan/Mar/ May/Jul/A ug/ Sep/Oct/Dec	9:30-1:15	100 tons	\$/ton 10 points \$1.00 \$10.00 \$20.00		
	Soybean Oil	Jan/Mar/ May/Jul/A ug/ Sep/Oct/Dec	9:30-1:15	60000 lbs.	<u>&cent;/lb.</u> 1 point \$6.00 1 <u>&cent;</u> 2 <u>&cent;</u>		
Chicago Mercantile Exchange www.cme.com	Lean Hogs	Feb/Apr/J un/Jul/Au g/ Oct/Dec	9:10-1:00	40,000 lbs.	<u>&cent;/lb.</u> 2 <u>&frac12;</u> \$3.00 2 <u>&frac12;</u> 5 <u>&cent;</u> points <u>&cent;</u>		
	Live Cattle (Finished Cattle)	Feb/Apr/J un/Aug/O ct/ Dec	9:05-1:00	40,000 lbs.	<u>&cent;/lb.</u> 2 <u>&frac12;</u> \$4.00 1 <u>&frac12;</u> 3 <u>&cent;</u> points <u>&cent;</u>		
	Live Feeder Cattle	Mar/Apr/ May/Aug/ Sep/Oct/Nov	9:05-1:00	50000 lbs.	<u>&cent;/lb.</u> 2 <u>&frac12;</u> \$4.20 1 <u>&frac12;</u> 3 <u>&cent;</u> points <u>&cent;</u>		
Mid America Commodity Exchange www.midamerican.com	Wheat	Mar/May/ Jul/Sep/Dec	9:30-1:30	1000 bu.	<u>&cent;/bu.</u> 1/8 <u>&cent;</u> \$1.25 20 <u>&cent;</u> 40 <u>&cent;</u>		
	Corn	Mar/May/ Jul/Sep/Dec	9:30-1:30	1000 bu.	<u>&cent;/bu.</u> 1/8 <u>&cent;</u> \$1.25 10 <u>&cent;</u> 20 <u>&cent;</u>		
	Lean Hogs	Feb/Apr/J un/Jul/Au g/ Oct/Dec	9:15-1:05	20,000 lbs.	<u>&cent;/lb.</u> 2 <u>&frac12;</u> \$5.00 1 <u>&frac12;</u> 3 <u>&cent;</u> points <u>&cent;</u>		
	Soybeans	Jan/Mar/ May/Jul/A ug/ Sep/Nov	9:30-1:30	1000 bu.	<u>&cent;/bu.</u> 1/8 <u>&cent;</u> \$1.25 30 <u>&cent;</u> 60 <u>&cent;</u>		

New York Cotton Exchange	Cotton No. 2	Mar/May/ Jul/Oct/De c	11:30-3:40	50000 lbs.	<u>&cent;</u> /lb.	1 point	\$5.00	<u>3&cent;</u>	<u>6&cent;</u>
www.nyc e.com									

Note - Some markets have variable limits which increase the daily limit and daily trading range when three or more contracts close with a limit move in the same direction three days in a row. Check with your broker if there's some doubt about daily limits.

Futures contracts are bought and sold at various commodity futures exchanges. Two of the major exchanges are the Chicago Board of Trade (www.cbot.com), which handles most of the grains, and the Chicago Mercantile Exchange (www.cme.com), which handles most of the livestock and poultry products. The Mid-American Exchange (www.midam.com), also in Chicago, trades in most grains and livestock, but its contracts (mini-contracts) specify less quantity of the commodity than the other two exchanges. For instance, corn and soybean contracts on the Mid-American call for 1,000 bushels or 1/5 the Board of Trade contracts.

What do these exchanges do as far as the trader in the futures market is concerned? First, the exchanges provide places where buyers and sellers come together or meet. They are "auction markets" for futures contracts just as the local livestock barn is an auction market for livestock. Anyone trading futures contracts must trade through individuals or groups who own "seats" (the right to trade on the exchange) on the exchange. Most people trade through brokerage firms who have representatives on the floors of these exchanges. The exchange floor is the place your orders and the orders of other traders are executed.

Another function of the Exchange is to assure equitable and orderly trading practices. Certain rules and regulations assure that trading is competitive and equitable and everything is fair and above board. Rules also facilitate orderly trading. One example of such a rule is the daily limits placed on the trading of various commodities. For example the corn market, on a given day, can move only 10 cents up or down from the closing price of the previous day. So if the market closes at \$2.20/bushel one day, the price cannot go above \$2.30 or below \$2.10 during the following day of trading. This keeps the market from moving drastically on any particular day.

The exchanges also provide complete price information. Prices are updated continuously on the big price boards at the commodity exchanges and disseminated at no cost in ten minute delays over the WWW. These prices are actual prices at which contracts were traded on the futures exchanges. Traders thus have the most accurate information possible on which to base their decisions.

How to Trade in the Futures Market

Futures contracts most often are bought and sold through commodity brokerage firms who own seats on the various exchanges. It should be noted the difference between full-service and discount brokers. A full-service broker provides not only the trading service (the actual buying and selling of contracts) but also price forecasting and other auxiliary services. The discount broker usually provides only the trading service. As expected, the costs associated with the discount broker are lower than the cost of using the full-service broker.

Once you select a firm you wish to trade through, you will be asked to fill out trading

agreements with the firm. Such agreements usually require some financial information, the purpose for which you are trading, and an acknowledgment that you understand the risk associated with buying and selling commodities. Once the account has been opened, you are ready to trade.

Before actually trading a futures contract, the trader must place margin money with the broker. Margin can be thought of as a kind of good faith money similar to a performance bond. It is money held by the exchange to ensure each trader lives up to his or her obligations to the market: If the trader loses money, the money will be there to transfer to those who make it. The initial margin required varies by commodities and brokerage firms. It usually will be between five percent and 10 percent of the value of the commodity traded. For instance, the total contract value of a 50,000 pound feeder cattle contract at \$.70 a pound is \$35,000. A typical initial margin to trade such a contract might be \$3,500. Initial margin also varies by the type of trader you are. Producers who are using futures to forward price normally are required to put up less initial margin than are speculators.

Initial margin may not be all the margin required after you have actually traded. If the market moves against your initial futures trade (goes down if you have bought or up if you have sold) then you may be required to put up additional margin. Usually the trader will be required to hold his or her margin at some specified level below the minimum initial margin required by the brokerage firm. Quite often this is about 75 percent of the initial margin. For instance, if you were required to put up \$3,500 to trade one feeder cattle contract, then a common maintenance level would be around \$2,625, or 75 percent of the initial \$3,500. In this case, if you lost \$875 due to unfavorable price changes, then you would be required to add enough money to your account to return it to the initial margin level. On the other hand, any excess margin above the initial margin could be withdrawn.

The margin worksheet below illustrates the margin account of a corn producer who sold one December corn futures on September 15 at \$2.75 a bushel. On September 16 the July corn futures closed at \$2.77. This resulted in a paper loss of \$.02 a bushel or \$100 (.02 x 5000 bu). The account stood at \$900, or \$150 above the maintenance level. On September 17 the corn futures closed at \$2.81. This resulted in a loss of .04 a bushel or \$200 (.04 x 5000/bu). Because the margin account dropped below the maintenance level of \$750 at the end of trading on the 17th, the producer would be subject to a margin call that day. If the margin call is not satisfied within a proper time, then the brokerage firm will automatically offset the position and return any remaining margin. Usually if the margin call is met within three business days the account will not be liquidated. **RECORD OF MARGIN TRANSACTIONS**

Commodity Corn Futures Month December Number of Contracts 1
 Contract unit 5000 bu. Initial Margin \$1,375 Maintenance Margin Level \$1,031

Date	Closing Futures Price	Previous* Acct. Bal.	Paper** Profit or Loss	Acct. Balance	Margin Call	Withdrawal
9-15	2.75	-----	-----	1,375		
9-16	2.77	1,375	-100	1275		
9-17	2.84	1,275	-350	925	450	

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*Account balance from previous date plus margin call amount or minus withdrawal amount.

**Change in price from previous closing price times contract unit.

The Cost of Trading

The actual cost of trading comes from two sources: interest on the margin money for the time it's out and the broker's commission for executing the trade.

Brokerage commissions vary by brokerage firms. Normally the more information provided by the firm the larger the commission. A recent survey of brokerage firms showed a wide range of commission for trading grain and livestock. Some firms traded for as low as \$15/contract while the most costly commissions were \$80/contract. These commissions are "round turn," and cover the cost of getting you both in and out of the trade.

Interest on margin is the other cost of trading. If additional margin is required, then interest cost will be increased. Tables 1 and 2 show the added cost of meeting additional margin calls at 10 percent annual interest rate.

If margin accumulates due to favorable price change, then interest can actually be gained on margin withdrawn. Since margin calls or withdrawals cannot be anticipated before trading, interest cost on the initial margin can be used to evaluate the cost of trading.

Table 1. Margin Required by Incremental Market Moves and Interest Cost at 10% Per Annum for Six Months (Corn or Soybeans)

Change in Price Per Bushel	1 Mini Contract 1,000 bu.		1 Contract 5,000 bu.		2 Contracts 10,000 bu.		10 Contracts 50,000 bu.		20 Contracts 100,000 bu.	
	Margin	Cost	Margin	Cost	Margin	Cost	Margin	Cost	Margin	Cost
<u>1&cent;</u>	\$10	\$30	\$50	\$2.50	\$100	\$5.00	\$500	\$25.00	\$1,000	\$50.00
<u>5&cent;</u>	50	2.50	250	12.50	500	25.00	2,500	125.00	5,000	250.00
<u>10&cent;</u>	100	5.00	500	25.00	1,000	50.00	5,000	250.00	10,000	500.00
<u>20&cent;</u>	200	10.00	1,000	50.00	2,000	100.00	10,000	500.00	20,000	1,000.00

Table 2. Margin Required by Incremental Market Moves and Interest Cost at 10% Per Annum for Six Months (Pounds - 250 pound Live Hog or 185 pound Carcass)

Change in Price Per Pound	1 Mini Contract 20,000 pounds (Carcass)		1 Contract 40,000 pounds (Carcass)		2 Contracts 80,000 pounds (Carcass)		10 Contracts 400,000 pounds (Carcass)	
	Margin	Cost	Margin	Cost	Margin	Cost	Margin	Cost
\$0.005	\$100	\$5.00	\$200	\$10.00	\$400	\$20.00	\$2,000	\$100.00
0.01	200	10.00	400	20.00	800	40.00	4,000	200.00

0.05	1,000	50.00	2,000	100.00	4,000	200.00	20,000	1,000.00
0.10	2,000	100.00	4,000	200.00	8,000	400.00	40,000	2,000.00

Who Uses the Futures Market?

Now that we have established what the futures market is and what is traded, let's look at who uses these markets and why.

Basically, two groups are interested in futures trading -- speculators and hedgers. Speculators enter in the futures market to establish a price for a commodity which they neither currently own nor have committed for production. Thus they have no intention of delivering or accepting delivery of the product traded. Speculators simply trade to make a profit from price level changes. They may not even know what a soybean or hog looks like, but they do know (or think they know) that the price of beans or hogs is too low (or high) and by buying (or selling) futures contracts today they can later liquidate this contract at a profit. So the key to speculating is buying low and selling high or selling high and buying low. Sounds easy doesn't it? Well before you jump the gun be assured that the majority of futures market speculators lose money. In fact, almost 90 percent lose.

Now let's look at the other trader in the market -- the hedger. The hedger establishes a price for a commodity currently owned or committed for production which will be delivered at some time in the future. So hedging is exactly the opposite of speculating in the market.

When you, as a hedger, use the futures market, you take an offsetting position in the futures market from the one you have in the cash market. For instance, when you use the futures, you sell the appropriate number of contracts in the futures market to establish a price. You sell because this is the opposite of your buying position in the cash market. Another, and perhaps simpler, way to keep this straight is to think of it as pre-selling in the futures market. Then, when the product is actually ready for delivery in the cash market (when you are ready to take the grain to the local elevator, the hogs to the buying station, or whatever), you buy the contracts in the futures market to offset or nullify the previous sale and deliver your product to your local market. Thus, any profits or losses you make in the futures market are offset by opposite profits or losses in the cash market. It's similar to a balancing scale -- when one goes up the other goes down. In terms of money, this puts you (the hedger) back at the price you originally wanted.

In summary, a producer-hedger operates in two markets and the action can be shown as follows:



Speculators, on the other hand, have no product to deliver. If they sell a contract in the futures market, they will have to later buy a contract to offset this previous sale (in the same way the hedger does). But when speculators offset their contracts, they have no product to sell on the cash market to offset losses in the futures market. They profit only to the extent they are able to guess which direction the market is headed. To make a profit, speculators must be able to buy, or offset, at a price lower than the price at which they sold, or they must sell at a price higher than that for which they bought.

So, hedging is a method of forward pricing that reduces risk. But speculating is a way of increasing risk because speculators take on the price risk associated with commodities which they do not own. The reason futures markets exist is to transfer the risk of price changes from those who do not want it (hedgers) to those who want to speculate on these price changes.

Most producers are speculators. They are speculators because they produce or store their products unpriced. They have the capital committed, the labor committed, and all their resources committed to the production of the crop or livestock, and they don't know what price they are going to get out of the product until the actual sale day. So they are sinking money and time into production and actually speculating on whether or not they are going to make a profit or loss. In this respect, the producer who produces unhedged is actually in the same position as the speculator in the futures market. The producer is gambling that the selling price will be higher than the buying price. So speculators can be found in either the cash market or the futures market.

Who are the speculators and who are the hedgers in the market? The speculators may be professional traders, generally short-term traders, who buy and sell contracts and offset them in the same day or after a short period of time. Or speculators may be business people, farmers or housewives, operating in either the futures or cash markets in an attempt to make money by anticipating price changes and who are not using the futures market to forward price.

Hedgers are producers, processors, handlers, dealers, or anyone who uses the markets, either futures or cash markets, to forward price their sales or purchases. Going back to a previous statement, hedging is simply forward pricing. If you use the futures market to forward price, you're a hedger.

Of course you are interested in how to hedge. Perhaps the best way to show this is take an actual example and show you how the two markets offset each other and allow the hedger to price without actual delivery to futures market points.

How Hedging Works

Since a hedger operates in two markets -- cash market and futures market -- we can use some numbers to show you exactly how this works. Let's assume you are a hog feeder interested in hedging a part of your hogs which you will be finishing out in early April.

Hog hedgers currently have two futures markets from which to choose. The Chicago Mercantile Exchange (CME) has a contract for 40,000 pounds of carcass weight while the MidAmerican Exchange has a contract for 20,000 carcass pounds. The first step for the hedger is to choose which contract to use. The CME carcass contract represents approximately 54,054 pounds of live hogs assuming a hot carcass yield of 74% (the amount of carcass from the live hog). Therefore the CME carcass contract represents about 216 head of 250 pound live market hogs (or 216 185 pound carcasses). The hog futures contract at the MidAmerican Exchange represents about 108 head of 250 pound market hogs. Continuing with the example, assume you want to price about 215 head and sell the hogs on a carcass basis. Thus, you choose the CME carcass contract.

You will be interested in the futures contract that matures closest to, but not before, the time your hogs will be ready for slaughter. Since there is an April contract and your hogs will be finished in April, you select this futures contract. You know by looking in the paper that April

futures closed today at \$70.50. You know how to trade futures contracts and have an account opened at a brokerage office. Now you are faced with two basic questions:

1. What does a futures quote of \$70.50 mean to you through a hedge?
2. Once you know what it means, how do you go about "locking" this price in?

Let's take a look at each of these questions. What does a futures price mean? You know \$70.50/cwt April Chicago mercantile contract price represents the average value of 51% to 52% lean carcasses reported by USDA during the middle of April. The MidAmerican lean hog contract represents similar carcasses. In either case the hedger's local market in April likely will not equal these prices. However, the local market price will be related to the futures market price during the delivery month as hog prices are determined in a national market. Since open futures contracts are settled based on the USDA reported prices at the futures contract's maturity, the futures price and cash prices will be the same at the end of the futures contract month.

The USDA carcass prices are taken from all the major packers across the country, representing almost all the hogs sold on a carcass basis during the day. You can assume that local prices will move with the market prices represented by the futures market. Therefore, if hog prices go up in the carcass market, prices at the local market should go up and vice versa. So if you know the relationship between your prices and the futures market prices, then you can determine what the futures market is offering today for hogs to be sold in your local markets in April. This relationship is called *basis*. Basis is the premium or discount used to adjust futures prices to local cash price levels.

For this example, assume that by looking at the difference between your local packer's base carcass prices in April and April futures prices over the last few years, you find an average difference of

- \$1.50/cwt of carcass. That is, the base carcass prices at your local packer in April are normally \$1.50 under the April futures prices on the same day.

Now you can adjust the futures prices you have. Today (February 1) the April futures contracts closed at \$70.50. If in April your normal market is \$1.50 under the April futures price, the future price means \$70.50 - \$1.50 or \$69.00⁽¹⁾. This is the price the futures market is offering February 1 for your hogs delivered at your own market in April through a hedge.

Let's put this in terms of the two markets in which the hedger operates the cash market and the futures market.

DATE	CASH	FUTURES	BASIS
February 1	Forward Price Target = futures price less basis or \$70.50 - \$1.50 = \$69.00/cwt carcass	April futures closed at \$70.50	-\$1.50

LOCKING IN A PRICE THROUGH A HEDGE

Now that you know what the futures market price means, how do you go about locking it in if you like this price? Recall from the previous discussion, the hedger takes an opposite position in the futures from the one he or she has in the cash. In this case, you would sell the number of contracts which cover the number of hogs you wish to forward price. You are in effect "pre-selling" your hogs in the futures market. Assuming you wish to price a group of 215 hogs, one Mercantile contract will be sold. By calling your broker and placing an order to sell one contract of April hogs at \$70.50 you now feel you have them priced at \$69.00 (\$70.50 less the

\$1.50 estimated basis). Note that for this example we will ignore the brokerage and interest cost of hedging.

Now take your example forward in time. It is now April and you are ready to sell your hogs at the XYZ Packer. You take your hogs to the packer and simultaneously buy back your futures contract. Your broker notifies you that you have bought a contract at \$75.00 while the base carcass price on your hogs was \$73.50 at the packer. Now what has happened to your forward price? Look at it in terms of the two markets again.

RISING PRICES

DATE	CASH	FUTURES	BASIS
Feb 1	Target price through hedge: Futures - Basis or \$70.50 - \$1.50 = \$69.00/cwt.	Sold one Apr. lean hog at \$70.50/cwt.	\$-1.50/cwt. (estimated)
Apr 10	Sold 215 head of hogs at XYZ packer at \$73.50/cwt carcass.	Bought one Apr. lean hog at \$75.00/cwt.	\$-1.50/cwt. (Actual)
		Futures results: Sold \$75.00 Bought \$70.50 resulting in a loss of \$-	
Actual price received: Cash price + gain or loss in Futures or \$73.50 - \$4.50 = \$69.00			

As you can see, the hedge resulted in a net price for your hogs of \$69.00/cwt. Just what you had planned. The gain you had in the cash market (\$69.00 vs. \$73.50) was just offset by the loss you had in the futures market, giving you the target price. Of course had you not hedged you would have received a higher price, but if you had known this back in February, why forward price? In fact, if you know which way prices are going, why grow hogs? Just speculate in the futures and forget about all the production troubles.

What would have happened if prices had fallen between February 1 and April 10? Look at the action in each market.

FALLING PRICES

DATE	CASH	FUTURES	BASIS
Feb 1	Target price through hedge: Futures - Basis or \$70.50 - \$1.50 = \$69.00/cwt.	Sold one Apr. lean hog at \$70.50/cwt.	\$-1.50/cwt. (estimated)
Apr 10	Sold 215 head of hogs at XYZ packer at \$64.00/cwt.	Bought one Apr. lean hog at \$65.50/cwt.	\$-1.50/cwt. (Actual)

		Futures results: Sold \$70.50 Bought \$65.50 resulting in a gain of \$5.00/cwt.	
Actual price received: Cash price + gain or loss in Futures or \$65.00 + \$5.00 = \$69.00			

Again, even though prices fell from the time the hedge was placed until April, you received your target price of \$69.00. Why? Because the loss you had in the cash market (\$69.00 vs. \$64.00) was offset by a gain in the futures (\$70.50 vs. \$65.50), giving you a target price of \$69.00/cwt for your hogs.

Note two things from this example: On April 10, the difference between the local cash price and the April futures is \$1.50/cwt, the exact basis the producer estimated back in February; second, the net price received equals the target price. In other words, the hedge locked in exactly the price you wanted, resulting in a perfect hedge. Regardless of which direction prices go, as long as the basis is estimated correctly the hedge will lock in the target price. What happens when the actual basis is different than the estimated basis? The "basis error" chart illustrates this situation.

BASIS ERROR

DATE	CASH	FUTURES	BASIS
Feb 1	Target price: Futures - Basis or \$70.50 - \$1.50 = \$69.00/cwt.	Sell one Apr. lean hog futures at \$70.50/cwt.	-\$1.50/cwt. (estimated)
Apr 10	Sold 215 head of hogs at XYZ packer at \$63.00/cwt.	Bought one Apr. lean hog at \$64.00/cwt.	-\$1.00/cwt. (Actual)
		Futures results: Sold \$70.50 Bought \$64.00 resulting in a gain of	
Actual price received: Cash price + futures gain or loss or \$63.00 + \$6.50 = \$69.50			

What has happened? The cash price received at your local auction was actually \$.50/cwt higher relative to April futures than expected, hence the net price is 50 cents greater than the target price (\$48.50 vs. \$48.00). Notice this is the same difference as the estimated - \$1.50 basis on February 1 and the actual basis of -\$1.00 on April 10.

The moral to the story is that hedging locks in a price exactly as long as the estimate of the basis is correct. However, in most practical situations there will be a small difference between actual and estimated basis. The net price and target price will differ by the amount of error in estimating basis. This is why it was stated in the beginning section that, in hedging through futures, we could lock in a price within a small range. This range is the range our basis varies.⁽²⁾

For our example, we have used a hog producer's hedge. The hedge works the same way for all commodities. To establish a price you "pre-sell" or sell the number of future contracts to cover the amount of production you wish to hedge. Then when you are actually ready to sell your production wherever you want, you buy back your futures contracts.

You will receive your hedge target price plus or minus the amount you miss your estimated basis.

Other Types of Hedges

There are two other type hedges which Georgia producers may find useful. Each of these is explained below.

THE STORAGE HEDGE

The storage hedge can be used by Georgia grain producers or handlers who have storage. It is accomplished much like the production hedges discussed in the previous section. As in the production hedge, you are pre-selling something in the futures market. So to price grain in storage, the storage hedger sells the number of contracts he or she wishes to price for delivery at a local buyer later on. Again, an example best illustrates the storage hedge.

Assume you have 20,000 bushels of soybeans to harvest. You could currently get \$5.42 for these beans. At the same time the May futures contract is trading around \$6.04. You know (by looking at past relationships between your market and the futures) that normally the local elevators pay about \$.20 less than the May futures for beans in May. Thus your normal May soybean basis is \$.20 under May futures. This means you could hedge your beans for about \$5.84 ($6.04 - .20$) and store them instead of selling them currently for \$5.42. If you can store beans for less than \$0.42 a bushel (5.84 hedged price - 5.42 price they could be sold for) then you could assure yourself a storage profit. In order to "lock in" the \$5.84, you would call your broker and tell him or her to sell four 5,000-bushel May bean contracts at \$6.04. If in early May the local elevators are paying \$4.43 for beans and the May soybeans futures are trading around \$4.63, then the hedge would have worked out as follows:

FALLING MARKET WITH A STORAGE HEDGE

DATE	CASH	FUTURES	BASIS
Nov 12	Beans currently selling for \$5.42/bu Target price of May hedge = $6.04 - .20$ basis = \$5.84/bu.	Sell 4 May futures at \$6.04/bu.	\$-.20/bu. (estimated May basis)
May 6	Sell 20,000 bu. of soybeans for \$4.43/bu.	Buy 4 May futures at \$4.63/bu. Profit in Futures: +1.41/bu.	\$-.20/bu. (actual May basis)
Net price received: Cash price + gain or loss in Futures Market or $4.43 + 1.41 = \$5.84$ /bu.			

If the futures market had gone up after harvest instead of down, the hedge would have worked out this way:

RISING MARKET WITH A STORAGE HEDGE

DATE	CASH	FUTURES	BASIS
Nov 12	Beans currently selling for \$5.42/bu Target price of May hedge = $6.04 - .20$ basis = \$5.84/bu.	Sell 4 May futures at \$6.04/bu.	\$-.20/bu. (estimated May basis)

May 6	Sell 20,000 bu. of soybeans for \$8.05/bu.	Buy 4 May futures at \$8.25/bu. Profit in Futures: \$-2.21/bu.	\$-.20/bu. (actual May basis)
Net price received: Cash price + gain or loss in Futures Market or $8.05 - 2.21 = \$6.84/\text{bu.}$			

The most likely outcome is one in which the actual basis varies from the estimated basis. The following storage hedge is actually what happened to a bean producer who stored beans in Georgia in November of 1998 and hedged them in the May 1999 futures contract.

BASIS ERROR WITH STORAGE HEDGE

DATE	CASH	FUTURES	BASIS
Nov 12	Beans currently selling for \$5.42/bu Target price for a May hedge = $6.04 - .20$ basis = \$5.84/bu.	Sell 4 May futures at \$6.04/bu.	\$-.20/bu. (estimated May basis)
May 6	Sell 20,000 bu. of soybeans in south Ga for \$4.43/bu.	Buy 4 May futures at \$4.75/bu. Futures market gain = +1.29 ($6.04 - 4.75$)	\$-.32/bu. (actual May basis)
Net price = Cash price + gain or loss in Futures Market or $4.43 + 1.29 = \$5.72/\text{bu.}$			

Again, you see that the hedge locks in the target price exactly if the basis has been estimated correctly. The target price will be missed by the amount the basis estimate has been missed. In the last example the basis in May was actually $-\$.12$ greater than had been anticipated. Thus the actual price received was \$5.72 a bushel vs. the target price of \$5.84 a bushel.

Storage hedges in Georgia have generally been profitable, while unpriced returns to storage have been erratic. This is shown in Figures 1 and 2. The storage hedge works because basis tends to be widest at harvest time and most often narrows during the storage year. This is not always true of cash market prices.

Figure 1. Results of Alternative Corn Marketing Strategies, Southwest Georgia, 1991-1999.

Year	Sold at Harvest (\$/bu.)	Stored, Not Hedged & Sold 8 Months Later (\$/bu.)	Stored, Hedged & Sold 8 Months Later (\$/bu.)
1991-92	2.33	2.71	2.80
1992-93	2.16	2.39	2.47
1993-94	2.54	2.68	2.60
1994-95	2.17	2.63	2.45

1995-96	3.04	5.48	3.51
1996-97	3.41	3.13	3.72
1997-98	2.67	2.67	3.04
1998-99	2.09	2.54	2.70

Figure 2. Results of Alternative Soybean Marketing Strategies, Southwest Georgia, 1991-1999.

Year	Sold at Harvest (\$/bu.)	Stored, Not Hedged & Sold 6 Months Later (\$/bu.)	Stored, Hedged & Sold 6 Months Later (\$/bu.)
1991-92	5.40	5.76	5.47
1992-93	5.32	5.76	5.51
1993-94	6.53	6.50	6.68
1994-95	5.26	5.39	5.67
1995-96	6.45	7.72	6.55
1996-97	6.61	8.30	6.60
1997-98	7.11	6.07	6.94
1998-99	5.42	4.43	5.72

THE BUYING HEDGE

Another way to use the futures market is to price something that will be bought in the future instead of something that will be sold. Livestock producers often use buying hedges because they will be purchasing feed in the future. However, the existence of the feeder cattle contract offers cattle feeders or backgrounders the opportunity to pre-price the cattle they will be feeding before actually purchasing them in the cash market.

Buying hedges may be initiated (1) in the belief that the commodity will be higher later on, (2) in order to make management decisions, or (3) in combination with a selling hedge to lock in total profits. No matter what the commodity, the buying hedge is a simple reversal of the futures and cash market actions used for the selling hedge.

A BUYING HEDGE EXAMPLE

Suppose you are a hog producer who needs 5,000 bushels of corn four months from now (August 1). You check the December corn futures (remember to select the futures which mature closest to, but not before, you need the corn) and find it is trading at \$2.40. However, this is the price you could lock in by accepting delivery in Chicago. You must adjust this price by your anticipated buying basis come November. If you were going to buy corn from local producers, you might use the basis figures found in "Basis Tables for Georgia Feeder Cattle, Hogs, Corn and Soybeans" since these represent average prices paid producers by elevators in the different areas

vs. futures prices.⁽³⁾ However, if you were going to buy this corn from elevators, you need to adjust this basis to account for processing and handling. Let's suppose you estimate your buying basis in November will be \$.10 under the December futures. Now you know what the \$2.40 December quote means for corn purchased in November locally (2.40 - .10 basis or 2.30). Let's assume you decide to lock in this price with a hedge. In this case, instead of pre-selling corn you will be pre-buying corn. So to price in the futures market, buy the appropriate number of contracts to price in August the corn you will be purchasing on the cash market in November. The following T-accounts (page 17) show the actions and results of three different situations using the buying hedge.

Notice that in each situation the net price paid equals the target price as long as the basis has been estimated correctly. When prices rise after the hedge is set, a profit in the futures market results to offset the higher price you have to pay for the corn in the local market. When prices fall after the hedge is set, it means a loss in the futures market which must be added to the lower price you pay for corn in the cash market. The loss results because you have to sell your futures contract back at a lower price than you bought it.

The basis error section shows, once again, that the target price will equal the net price as long as the basis has been estimated correctly.

RISING MARKET WITH A BUYING HEDGE

DATE	CASH	FUTURES	BASIS
August 1	Target buying price = 2.40 - .10 basis = 2.30	Buy 1 December futures @ 2.40	\$.10/bu. estimated
November 10	Buy 5,000 bushels of corn locally @ 2.80	Sell 1 December futures @ 2.90 Futures results = Bought 2.40 Sold <u>2.90</u> resulting in a profit of	-.10 actual
Net price paid: Cash price <u>&plusmn;</u> gain or loss in Futures or 2.80 - .50 profit in Futures = 2.30			

FALLING PRICES WITH A BUYING HEDGE

DATE	CASH	FUTURES	BASIS
August 1	Target buying price = 2.40 - .10 basis = 2.30	Buy 1 December futures @ 2.40	\$.10/bu. estimated
November 10	Buy 5,000 bushels of corn locally @ 2.00	Sell 1 December futures @ 2.10 Futures results = Bought 2.40 Sold <u>2.10</u> resulting in a loss of - .30	-.10 actual

Net price paid: Cash price ± gain or loss in Futures or 2.00 + .30 loss in Futures = 2.30

BASIS ERROR WITH A BUYING HEDGE

DATE	CASH	FUTURES	BASIS
August 1	Target buying price = 2.40 - .10 basis = 2.30	Buy 1 December futures @ 2.40	\$.10/bu. estimated
November 10	Buy 5,000 bushels of corn locally @ 2.60	Sell 1 December futures @ 2.65 Futures results = Bought 2.40 Sold <u>2.65</u> resulting in a profit of .25	-.05 actual
Net price paid: Cash price <u>&plusmn;</u> gain or loss in Futures or 2.60 - .25 profit in Futures = 2.35			

Hedging Summary

Hedging is a way to transfer the market risk of owning or producing a product to those who want this risk. It is a way to pre-price something you produce, store or will need to buy. When used properly it can be a very flexible pricing tool which Georgia producers can use to control the price risk they must deal with in today's agriculture.

Use the following steps when a forward pricing decision is to be made.

1. Determine cost of production for the product or its storage cost. This is the only way to determine whether pricing opportunities are profitable.
2. Localize the futures price by determining your local basis for the time, place and quantity you will be selling. Compare these prices to cash contract prices available at the same time.
3. Determine the risk of producing or storing unpriced. For instance, how high or low do you think prices could be when you actually sell the product? Can you afford the risk that prices might actually be at the lower extreme?
4. Decide which forward pricing tool best fits your operation based on the advantages and disadvantages of cash contracts vs. hedging in the futures market. Remember, smaller quantities of anticipated production should be priced using cash contracts rather than with futures due to flexibility.
5. Develop a pricing plan based on your operations and stick to it. Changing plans in mid stream usually results in an eventual dissatisfaction with forward pricing.

If you do decide to forward price through the futures market, remember these precautions:

1. Margin money must be available if you are to hold a hedge.
2. Don't let your broker make pricing decisions for you. Use his or her information and advice but remember, only you can decide what is best for your operation.
3. Don't combine hedging and speculation. If you want to speculate in futures, keep separate accounts. No one ever lost a farm through true hedging; many have through speculation.
4. Don't hedge until you know what you are doing. "Paper" trade until you are certain you understand all aspects of hedging.
5. Don't hedge until you investigate your local basis.

1. To convert a carcass price to a live price, multiply by the percentage a live hog is expected to yield as a carcass. A commonly used yield is 74%. Using this conversion, the example carcass futures price of \$70.50 is equivalent to \$52.17 ($\$70.50 * .74$) on a live weight basis.
2. For a more detailed discussion on basis and actual basis estimates for grains and livestock in Georgia, ask your county agent for "Basis Tables For Georgia Feeder Cattle, Hogs, Corn and Soybeans, " Extension Marketing Department, Special Report 169.
3. Tables available in your county Extension agent's office.