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Hedging by a central Iowa elevator

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HEDGING BY A CENTRAL IOWA ELEVATOR

by

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INTRODUCTION

In 1967 the farmers of Iowa produced 930,155,000 bushels of corn and 145,692,000 bushels of soybeans. About 43 percent of the corn crop or 399,967,000 bushels of corn was sold by the farmer at some time during the year and 98 percent of the soybeans or 142,250,000 bushels was sold (14). Production of corn and soybeans in Iowa as well as the entire United States is a seasonal operation. The consumption of these two commodities does not follow the same pattern as production but is a continuous process.

In Iowa the bulk of the harvest of corn and soybeans comes approximately in the two month period of October and November. Regardless of this, the consumption of these two commodities is spread throughout the entire year. Because of the time lag existing between production and consumption, some individual must be willing to store corn and soybeans the necessary time to comply with the rate of consumption. In return for his services in storing the grains, the warehouseman or person who provides the storage facilities will expect sufficient return to cover operating expenses plus a normal amount of profit. The utility created by the warehouseman depends on the utility of the grains to consumers at some time removed from harvest.

In the 1963 to 1968 period in Iowa soybean prices have fluctuated as much as one dollar per bushel during a twenty-four week period of storage. Even a decrease of two cents per bushel in the value of grain stored becomes very serious when computed for a total storage inventory of 100,000 bushels. A two cents per bushel decrease in value for the average sized central Iowa elevator with 340,000 bushels of total storage capacity (19, p. 15) full of grain would result in a loss on the value of grain stored

amounting to $6,800. Over the years elevators storing grain have experienced many such two cent price decreases on stored grain. This study attempts to analyze the results of storing corn and soybeans in central Iowa and proposes some tactics which warehousemen may use to insure against price risk.

Objectives

The purpose of this study is to examine the uses of hedging in reducing the risk involved in the ownership and storage of corn and soybeans for country elevators in central Iowa. The main objectives of the study are as follows:

1. To examine alternative methods and uses of hedging by country elevators.
2. To determine the effectiveness of each type of transaction under hypothetical conditions.
3. To investigate the presence of any consistent seasonal patterns.
4. To detect to what extent hedging improved the transfer of the price risks involved in storing soybeans and corn.

In addition to this an attempt will be made to establish some guides to use in determining whether grain purchases should be hedged and, if hedging appears profitable, in what month to place the hedge. Also some discussion will be given of other types of hedging which are profitable in addition to the more common storage hedge which exists when the stocks of grain actually owned by a warehouseman are offset by futures commitments. This study will deal with the problem which faces the manager of a typical country elevator in central Iowa each day as he buys grain. The manager

must decide whether or not to hedge his inventory; and, if he chooses to hedge, he must decide in which delivery month to place the hedge. If he finds the hedge must be moved to a more distant month to cover the full storage period, the effectiveness of hedging is decreased due to the increased brokerage costs. Possibly, the hedge is placed in a month too distant from the date of sale of the grain and a poor price relationship exists between the cash and futures markets.

Survey of Related Studies

A number of related studies which analyze the results of hedging operations will be discussed below.

Richard G. Heifner

Heifner (9) used bid prices for cash grains in Michigan and corresponding closing price quotations of futures contracts at the Chicago Board of Trade. His study was for corn, white wheat, red wheat, oats and soybeans during the marketing years of 1952 to 1963. Four lengths of storage periods for each commodity were examined.

The storage year began at harvest for each grain and consisted of five trading periods spaced at two month intervals. Each storage rule used called for the same transactions during the same trading periods in each marketing year. The gross revenue for unhedged storage was set equal to the change in the cash price over the storage interval. For hedged inventories, gross revenue was set equal to the negative of the basis change over the storage interval.

From these gross revenue figures Heifner deducted the standard brokerage commissions for round turns for hedges. Interest was deducted at a

five percent annual rate on required margin deposits and on the money invested in the stored grains.

Heifner concluded that the seasonal price movements observed during the 12 years under study could not be interpreted as evidence of a positive serial correlation in futures prices. For some of the longer storage intervals for corn and soybeans, Heifner found that years of high storage earnings tend to be followed by years of low storage earnings and vice versa. He felt there was no reason to expect average storage earnings on hedged inventories to differ from average storage earnings on unhedged inventories when the commodities are held over the same intervals each year. Heifner's work shows that hedging would have reduced the variability of storage earnings in Michigan even for those grains such as corn and wheat where government support programs have strongly influenced prices. The gains from hedging were most pronounced for soybeans where government influence on prices was probably least.

In most cases, hedging in a contract expiring soon after the intended sale would usually be preferred to hedging in a contract expiring later if the sales date is firmly established when the hedge is made.

Heifner used the standard deviation (or equivalently the variance) of the storage revenue as a measure of risk. For every grain and every storage period considered the standard deviation of the storage revenue was less with hedging than without hedging. F ratios were computed for each pair of storage rules by dividing the variance of the revenue with hedging by the variance of the revenue without hedging. These figures provide strong evidence that hedging reduces price risks in storing soybeans, red wheat, white wheat, and corn in Michigan. It appears that hedging also

reduces price risks in storing oats but the results are less conclusive. These results are generally in accordance with economic theory and with past studies and recommendations regarding hedging.

In another article written by Heifner (10), he concludes that the storage season for each grain can be divided into three intervals. During the first interval after harvest, storage returns exceed the variable costs virtually every year. Storage returns are approximately equal to variable costs during the second period following harvest and continued storage is sometimes unprofitable. Finally, there is the remainder of the marketing year when storage returns rarely exceed variable costs.

Heifner has developed some conditional storage rules which make use of price predictions based upon cash-future spreads. His rules show the most potential during the second interval which falls during the second to fourth month of storage. Storage is profitable almost every year during the first interval and the potential gains from using such predictions are small. A similar argument applies to the third interval when it is difficult to anticipate the unusual year when continuous storage is profitable.

Truman F. Graf

Graf's study was concerned with two major objectives: 1) to examine the need for hedging, and 2) to examine the effectiveness of hedging (8, p. 399). The need for hedging results from cash price changes. To analyze the effectiveness of hedging, hedges which could have been effectuated at the close of trading each Friday during the years 1949-51 were reconstructed using Chicago Board of Trade futures prices and Chicago cash grain prices.

In the study Graf does show that a hedging situation which protects the short basis hedgers (sell cash and buy futures) can do so only by re-

ducing the gains to the long basis hedgers (buy cash and sell futures). For instance, if cash prices rose ten cents a bushel and futures prices remain unchanged, the long basis hedger would make ten cents, whereas if the futures prices also rose ten cents he would make nothing. It might seem that the first hedge was the most effective. Actually, just the reverse is true, because in the first case the short basis hedger (sell cash and buy futures) would have lost ten cents, while in the second case he would have lost nothing. To be 100 percent effective then, to both long and short basis hedgers, the hedge must result in neither a gain nor a loss which means the basis remained constant.

The purpose of hedging was defined by Graf to be the removal of risk resulting from changes in cash prices between the time of purchase and the time of sale (8, p. 402). The effectiveness of hedging was then computed as the degree to which gains or losses on unhedged grain could have been reduced by hedging. Graf determined the average effectiveness during the 1949-51 period was around 35 percent. The hedges in 1951 were two and one-half times more effective than they were in 1949. Graf explains this to be a result of extensive purchases of grain by the Commodity Credit Corporation in 1949.

During the period cash price change, as a percent of the cash price, averaged 5.2 percent. Hedging removed 1.8 percent of the price change expressed as a percent of the cash price, thus leaving 3.4 percent of the change unremoved by hedging. Studying the effectiveness of hedges during different periods of time somewhat qualifies the severity of this situation. This showed that hedges are most effective in periods of large cash price change.

On the average it was advantageous to hedge in the near or second near month future only when futures prices were not more than five cents above or below cash prices when the hedge was effectuated. Fifty-three percent of the risks associated with price change was removed within these limits. On the other hand, hedges became almost completely ineffective when futures prices were either above or below cash prices by more than five cents (8, pp. 412-413).

Holbrook Working

Working feels that the traditional "risk avoidance concept" of hedging is seriously misleading (22, pp. 436-443). Hedging is done for a variety of reasons, and not merely to avoid risk. There are the following categories of hedges: 1) carrying-charge hedging to earn a direct profit from storage, 2) operational hedging to facilitate operations involved in a merchandising or processing business, 3) selective hedging according to price expectations, and 4) anticipatory hedging to serve as a temporary substitute for a merchandising contract that will be made later. Working finds that hedging is not undertaken primarily as a sort of "insurance", but is more commonly used in anticipation of a favorable change in the basis or the relation between spot and future prices. He states that the fact that risks are less with hedging than without is often a secondary consideration.

T. A. Hieronymus

Hieronymus (11) uses the basis as existed for Champaign, Illinois for the marketing years of 1960, 1961, 1962, 1963, 1964, 1965, and 1966 for both corn and soybeans. The results of the basis study are compiled into a discussion of the profitability of hedging at Champaign, Illinois for each

of the above marketing years.

The relationship of cash and futures prices is based mainly on the theory of the carrying charge. This theory rests on three facts as stated by Hieronymus: 1) grain is produced at one time of year and is used at a fairly regular consumption throughout the year so that inventories must be carried from harvest time forward, 2) there are costs in storing and maintaining the grain, and 3) there is virtually no cost in holding futures contracts (11, p. 5). From these three facts it follows that cash prices should increase in relation to futures prices as the storage season progresses. This would also dictate that the cash price should equal the futures price during the delivery month, but the past has shown that cash prices are nearly always higher than the futures during delivery month. Grain in the futures market may be delivered to the buyer any day during delivery month. This makes it difficult to run a plant; thus, cash grain is worth a bit more than futures. Users also may have specific quality preferences which may not comply with the deliverable grade in the futures market which again increases the value of cash grain. When grain is delivered in Chicago, load-out and switching charges must be paid by the person taking delivery. Corn bought to arrive by rail in the cash market can be switched to any point in the Chicago area without additional cost which increases the value of cash corn relative to futures. The final reason suggested by Hieronymus is that the value of the railroad billing accompanying the car of grain received is different. Minimum-value billing is usually furnished with grain on delivery in the futures market (11, p. 5).

Hieronymus summarized the results of hedging for both corn and soybeans in the conclusion. His work showed that after narrowing as Commodity Credit

Corporation corn left the country, the harvest basis appears to be again getting wider under the pressure of field-shelled corn. The harvest basis for corn is considerably more eratic than the July 1 basis for the period under study. Hieronymus has found that the bulk of storage earnings are made by the turn of the year. This early return underscores the need for space to store corn at harvest. After harvest storage is abundant and cheap. Hieronymus has shown that the basis for soybeans has tended to be narrower during recent years than in 1960 and 1961. The best hedging basis is often available during the summer rather than at harvest. This would suggest that summer purchases should be hedged and carried into harvest in his area. The period of most rapid basis gain was from harvest to January 1. Storage from April 1 to May 1 does not pay. Soybean storage has not paid as well as corn storage, especially in recent years. It costs about one cent more per bushel per month to store soybeans than corn because of the higher interest cost.

STATEMENT OF THE PROBLEM

Any individual who accepts the ownership of a commodity is also accepting the risk inherent with the ownership. The producers of the grain were subjected to the risks of weather, insects, prices and numerous others. The firms such as country elevators who make a business of buying the grain from the producers also face risk in the form of fire, theft, spoilage and price changes.

There are various forms of insurance against many of these uncertainties such as weather, fire, and theft; but there is a limit as to what you can insure. There are no insurance policies sold today which will protect a firm from price risk. A decrease in the price of grain from the time an elevator purchases it until the time the grain is sold will result in a loss on the transaction. Of course, the grain prices could have been increasing during that same period which would have resulted in a profit from the storage operations. Any producer, warehouseman, processor, exporter, or manufacturer who owns grain is faced with the speculative risk of price changes. The value of the stocks owned is subject to change due to changes in the market price. H. S. Houthakker states that few commodities have stocks which are always zero (services and electric power are conspicuous examples) and not many more of which stocks do not change over time (e.g., natural gas in a pipeline). Of all other commodities, production does not always equal consumption. Houthakker suggests some possible reason for the differences between production and consumption of grains (12, p. 135). The cost of production may vary over time as a result of natural causes or weather. Natural rain is a cheaper source of water than irrigation, for

example. Similarly it is economical to reserve some grain from an abundant crop for use in subsequent years in which nature may be less generous. Large quantities of grain may cost less per unit than small quantities due to transporation rates, and it may be cheaper for a processor to obtain large quantities at intervals and store them until used. This would require that country elevators be able to supply grain in large quantities, thus forcing them to store it until inventories can be massed. Finally, differences between consumption and production may emerge against original intentions rather than on the grounds of efficiency mentioned previously. Production may have been planned to meet estimated consumption, but weather factors may increase or decrease production considerably. Storage is then a way of taking care of surplus or of meeting deficiency.

The production of grain is not a continuous process in the United States so there must be a means of storing the large annual production and distributing it to consumers as needed throughout the remainder of the year. It is during this storage period that the owners of the grain are subjected to the possibility of price changes. My objective is to show how a warehouseman might reduce the risk of price changes. Warehouseman may be used to refer to anyone who holds or stores grain such as the producer, local elevator, terminal elevator, or a processor. In this study warehouseman refers specifically to the country elevator operator who is storing grain.

A warehouseman may reduce his risk of price change for grain he is storing through "to arrive" sales. These may be contracts which he negotiates directly with another party interested in buying grain such as a terminal elevator or a grain processor. The buyer thoroughly intends and

wants to take delivery while the seller wants to make delivery of the physical commodity. This type of a sale may be for any grade or quality of grains and for any destination designated by the agreement of the parties involved. A sale of the physical commodity for future delivery removes the risk of price changes because the party selling the grain knows how much profit he will have from the use of his storage space. For example, a country elevator operator might buy grain from a farmer for $1.00 per bushel and immediately make a sale or commitment to deliver grain of a similar grade to a particular processor six months in advance for $1.25 per bushel. The country elevator operator would then know that, regardless of price changes in the next six months, there will be a profit of twenty-five cents to cover carrying charges and transportation. Carrying charges are the sum of warehouse charges, insurance, interest and estimated change in weight (15, p. 220). Regardless of price changes in the cash market during the six month period of storage the grain will be delivered and a profit of twenty-five cents will be realized by the country elevator. This method of selling removes all risk due to price decrease on commodities in storage. It also removes any opportunity to benefit from cash grain price increases during the period of storage. Traders in the cash market would refer to this as a "forward" or "deferred" sale (5, p. 46). This convention will be accepted in this study also.

Another form of to-arrive sales may be used by a warehouseman. A sale could be made to some unknown individual through the facilities of a commodity exchange such as the Chicago Board of Trade. This type of transaction is more commonly referred to as a futures contract. A futures contract is an agreement between two parties whereby the buyer will receive

and the seller will deliver a commodity at a later time.

The question left to be answered is the distinction between cash transactions and transactions in the futures market or more accurately the distinguishing features of the cash market and the futures market.

Both forward sales and futures transactions are agreements to buy and sell with the delivery of the commodity occurring at a later time. All trades or agreements in the futures market are for the same sized unit or same total number of bushels. For corn and soybeans on the Chicago Board of Trade the standard contract unit is 5,000 bushels. In the cash market an agreement can be worked out for a trade of one bushel or one million bushels with great flexibility allowed. An agreement in the cash market may allow the seller to draw a certain percent of the total sale value in advance. In the futures market, regardless of whether an individual is buying or selling, he must deposit margin money with his broker. This margin is posted as a guarantee of fulfillment of a futures commitment (3, p. 38). The margin required for one contract of corn is $400 while $600 margin must be deposited for a contract of soybeans.

Another distinctive feature of a futures contract is that it may be offset later by a contra-trade through the same broker. When an individual is making an offsetting trade, it is not required that he deposit more margin with his broker. In the cash market a firm would be jeopardizing its reputation if the seller did not deliver or the buyer did not accept as originally agreed. In the futures market, the use of offsetting trades are a well accepted means of removing the obligation of ownership of grain at some time. In fact, it is the freedom of making an opposite trade or "liquidating a position" that gives speculators more incentive to trade.

A speculator is a person who will accept the risk of loss in the hope of profit (16, p. 1). Speculative activity has been attacked as an evil of the commodity market but nothing could be further from the truth. Extensive speculative activity is a necessary condition for the smooth flow of commodity futures trading (17, p. 218). Without speculators in the market it would be virtually impossible for firms in the grain trade to follow a consistent hedging policy. The speculators own no grains, generally, but attempt to profit from market trends by proper timing of their sales or purchases of futures contracts. The increase in the volume of trading as a result of speculators makes it possible for hedges to be placed and lifted by firms in the trade without affecting the price level. If a firm wishes to hedge by selling twenty contracts and the daily volume is 1,000 contracts, the effect on prices when the order is placed will probably be negligible. However, if the daily volume were only 80 contracts, this single order represents one-fourth of the total which would certainly have an influence on price.

The flexibility of speculative transactions has allowed the development of arbitrage operations which would not legally be possible if trading were limited only to hedging. This attribute is responsible for keeping the proper relationship in prices for different delivery months and prices for alternative locations. Speculators hope to discover from the study of existing conditions the markets or commodities which are out of phase with each other. The combined, persistent activity of speculators selling in the high-priced market and buying in the low-priced market tends to bring about the readjustment in values in all markets, even those on another continent (7, p. 219) The purpose of commodity exchanges is mainly to serve

the needs of various industries desiring to hedge. Speculative participation is necessary to its fulfillment.

A speculator can avoid making or taking delivery on his contract by closing out his position before the first business day of the delivery month of his option. The margin deposited is a guarantee that he enters into the contract with good intent. Usually less than one percent of the total futures contracts that are entered into are ever settled through deliveries (15, p. 16).

In the cash market delivery of the grain can be arranged for any time as long as both parties agree. Also the location of delivery and specific physical qualities are flexible in the spot or cash market. This is not true in the futures market. Points of delivery and grades are standard for all trades. Delivery months for corn are December, March, May, July, and September. Soybean delivery months are January, March, May, July, August, September, and November. Anyone who has sold a May contract could deliver the grain in an approved warehouse, surrender the warehouse receipt to the buyer in May and receive full value for the grain. If the grain does not meet minimum standard grade, discounts must be deducted for quality; but no premiums are paid for grain of better quality being delivered against a futures contract. At any time during a delivery month an individual who owns or buys a contract for that month may receive notice of delivery. In the cash market, the buyer can be more certain as to when he will receive the grain. The buyer in the spot market can also be more certain of the quality of grain, and if a specific quality of grain is desired, he may choose to pay a premium to insure that he receives it.

Prices in both the cash market and the futures market fluctuate. The

price in the cash market is determined by a direct confrontation resulting in an agreement of the two parties of the trade. The futures price is arrived at by open outcry around a ring within the hours prescribed by the exchange rules. Prices in both markets are determined by supply and demand. Because these two factors are in turn determined by estimates, they are continually changing. This results in cash and futures prices fluctuating. People who store grain for later sale in the cash market and speculators in the futures market try to make best advantage of these price changes to increase their profits.

Through a procedure called hedging a warehouseman who buys grain to store can, at least in theory, reduce his risk of loss due to price decreases lowering the value of his stocks. Hedging involves taking a position or making a trade in the futures market which is equal but opposite to a transaction in the cash market. To a warehouseman buying grain, hedging would require that he sell an equal amount in the futures market. It is the purpose of this study to investigate the financial potential which was available during the past five crop years. It is a test to see if any risk due to ownership or storage had been removed and, if so, what the effects might have been on the profitableness of warehouse operations.

Often, a warehouseman who has experienced a price decrease lowering the market value of inventories will recoup some of these losses by charging the local users or the farmer who buys corn for feed purposes much more than the established market price. In other words, instead of absorbing his loss, he charges the local buyer more than he should just to insure his storage profits. If the warehouseman had hedged his inventories properly, he might not need to force the farmer to accept the loss due to the ware-

houseman's error in judging the cash market.

This study will attempt to analyze the market situation which confronted the typical warehouseman in central Iowa from October 1, 1963 to October 1, 1968. The warehouseman must be able to give his farmer customers a price for their grain every day. A decision must be made each day as to what price he should pay. If the grain is actually purchased from the farmer, a choice must then be made between selling it immediately to a processor or terminal market or maybe the warehouseman should store the grain and wait for an increase in price. Perhaps the warehouseman decides to keep the grain in storage. Under this assumption he must then make a decision as to whether or not to hedge by selling an offsetting futures contract. If the alternative chosen is to hedge the purchase, then the proper month for delivery must be selected. This study is an attempt to analyze these decisions over a five year period and to make some recommendations and establish some guides to aid in selecting the most profitable choice at each stage of the process.

THEORY OF HEDGING

Holbrook Working defined futures trading in commodities as

> "trading conducted under special regulations and conventions, more restrictive than those applied to any other class of commodity transactions, which serve primarily to facilitate hedging and speculation by promoting exceptional convenience and economy of transactions". (20, p. 315)

R. J. Mutti gave a similar definition of futures trading but stressed the point of it being a "firm commitment to deliver or receive specified quantities and grades of a commodity during a designated month, with price being determined by public auction in the pit" (4, p. 7). With today's system of communication, the purchase or sale of a futures contract can be readily consummated nearly anywhere in the world. Regardless of the ease of transactions, both parties enter into the trade in good faith and either may face severe penalties for not fulfilling his obligation. Futures contracts are for receipt or delivery of a specified quantity and quality of grain and a specified delivery location. Each contract traded in a particular grain on the Chicago Board of Trade is consistent in these respects regardless of who the parties of the trade are. The futures contracts for a particular commodity may vary in the designated month in which delivery is to be made or taken. Through the years of trading on the Chicago Board of Trade, the delivery months for corn and soybeans have become standardized. Corn futures are traded for delivery in December, March, May, July, and September. Soybean futures are traded for delivery in January, March, May, July, August, September, and November.

If the price for future delivery is greater than the spot price at any location by more than enough to cover transportation, storage, and delivery

costs, there exists a potential profit. The gain could be taken by purchasing the commodity in the cash market and simultaneously selling a futures contract and making delivery on the futures contract. Conversely, a person who has bought a futures contract during the month of delivery, such as buying a July contract in July, may find that he could take delivery of the physical commodity for less than he could buy grain in the cash market. If he is in a business where he needs grain, he has a cheaper source of supply. If he has no use for grain, he could sell the grain delivered to him on the cash market.

Because the possibility of either making or taking delivery always exists, there is a relationship existing between cash grain prices at any location and the futures prices. This connection between cash prices and futures prices is commonly referred to as the basis.

Ordinarily the basis for a country elevator is computed by subtracting the cash price from the futures price. On any given day the amount which a country elevator has to cover storage, transportation, and delivery charges from that location and time to the place and time of delivery is shown by the basis. Use of commodity futures by a country elevator as a hedge involves "the purchase or sale of futures in conjunction with another commitment, usually in the expectation of a favorable change in the relation between spot and futures prices" (20, p. 326).

A strict hedger would establish his positions in both the cash and futures markets at the same time or as near as possible. For example, if a warehouseman buys 5,000 bushels of corn, the sale of a futures contract would be executed as quickly as possible. Table 1 illustrates with hypothetical data how the warehouseman would show the transaction in T-account

Table 1. Recording a storage hedge

Cash market	Futures market	Basis
Buy 5,000 bushels @ $1.10	Sell 5,000 bushels @ $1.30	$.20

form.

The basis when the corn is purchased is twenty cents. If the warehouseman were to make delivery on the future position, he would have a gross income of twenty cents per bushel to cover handling, storage, interest, insurance, transportation, and miscellaneous costs.

On some later date, the warehouseman decides to sell the corn he has in storage. The hedge should also be lifted (buy back the futures contract) at the same time. If the hedge is not lifted, the warehouseman is moving from the area of risk reduction through hedging into speculation in the futures market. Table 2 shows the records of the warehouseman for this single transaction after the grain is sold and the hedge lifted.

The price at which the cash grain was bought was the price the warehouseman paid the farmer. The selling price in the cash market was that which a terminal elevator or a processor paid the warehouseman. The futures prices show the market level of contracts for delivery in a particular month.

The net gain is zero in the preceding example. A loss of five cents per bushel in the cash grain is offset by a gain of five cents in the futures position. An alternative method of considering this is that the basis has not changed. Therefore, the net result is zero as long as the

Table 2. Results of a storage hedge

Cash market		Futures market		Basis
Buy 5,000 bushels @ $1.10		Sell 5,000 bushels @ $1.30		$.20
Sell 5,000 bushels @ $1.05		Buy 5,000 bushels @ $1.25		$.20
Loss	$ .05	Gain	$ .05	0

Table 3. Results of a storage hedge with a narrowing basis

Cash market		Futures market		Basis
Buy 5,000 bushels @ $1.10		Sell 5,000 bushels @ $1.30		$.20
Sell 5,000 bushels @ $1.05		Buy 5,000 bushels @ $1.15		$.10
Loss	$ .05	Gain	$ .15	Gain $.10

Table 4. Results of a storage hedge with basis widening

Cash market		Futures market		Basis
Buy 5,000 bushels @ $1.10		Sell 5,000 bushels @ $1.30		$.20
Sell 5,000 bushels @ $1.05		Buy 5,000 bushels @ $1.30		$.25
Loss	$ .05		0	Loss $.05

basis remains constant. Any price change on one side of the hedge will be offset by a price change on the other side. If the cash grain price decreases while the grain is in storage, the futures price will decrease an equal amount under the assumption of a constant basis. Consequently, the loss on the cash grain would be offset by the gain on the futures position. It would then be possible to buy back the futures contract for less than it was sold.

The hedger is not concerned with what happens to prices in the cash market or what happens to futures prices. The hedger is concentrating on what happens to the basis. As the delivery month approaches, the basis should narrow or reduce because fewer days of storage are required. Table 3 shows the hypothetical results when the basis narrows for a storage hedge.

The five cent loss in the cash market is offset by a fifteen cent profit on the futures position for a net gain of ten cents. The same result is obtained by deducting the basis on the day the grain is sold or selling basis from the basis when the grain is bought or the buying basis. As the basis narrows, the hedger makes a profit from his storage operation as shown in Table 3. Fundamentally, there are two ways in which the basis can narrow. Either the futures price will decrease more than the cash grain price decreases or the cash grain price increase will exceed the futures price increase or the futures and cash prices will move toward each other.

Conversely, as the basis widens, this type of a hedge stands to result in a loss. A wider basis could come from cash prices decreasing more than futures prices decrease or futures prices could increase more than cash prices increase or cash prices and futures prices could diverge. Table 4

shows the results of a single hypothetical situation in which the basis has increased or widened. The falling price in the cash market was not offset by a similar decrease in the futures price. As a result the basis widened by five cents for a net loss of five cents.

Anyone who owns the cash grain and holds a hedge against his inventory does so in the belief that the basis will become narrower and not become wider than it was when the hedge was placed. A hedger is no longer speculating as to what the absolute prices will do but is speculating as to what the basis will do. Hedging is based on the assumption that the cash and futures markets move in a fairly parallel fashion, so that changes in the basis are more predictable than changes in the absolute price levels themselves. The success or failure of hedging depends on the accuracy of basis forecasting.

Basis patterns for a particular location tend to follow generally similar paths from year to year. Yet at the same time, each year is different and special. The reasons for basis patterns revolve around the price of storage and the changes in location of stocks and utilization of the stocks of grain. Hieronymus has discussed what he considers to be the primary factors in the price of storage (11, p. 10).

During the spring and summer when farmers are planting and raising the next crop, the new crop basis (cash bids for harvest shipment versus the first new crop contract) is speculative. The merchants in the trade are trying to price the local grain at an appropriate relationship to Chicago and establish the price of storage from harvest to the first delivery month. Early in the bidding for new crop year delivery merchants are likely to bid a basis of about the same size as existed a year earlier. As the season

progresses, yield estimates become more established and the need for storage space can be appraised. Finally, harvest makes the crop size felt and it becomes a major factor in the basis.

The willingness of farmers to sell grain at harvest varies from year to year. In some years they sell before and during harvest, and other years farmers hold a high proportion of the crop on farms. As farmers hold grain on farms, the need for off-farm storage is less. The result is that cash prices are high in relation to futures. The warehousemen are willing to charge less for their storage space in order to convince the farmers to sell the grain. With the rapid change to field shelling of corn, off-farm movement and sales of corn at harvest has increased.

In 1965, 30.3 percent of the corn in central Iowa was harvested as shelled corn but in 1968, 45.1 percent of the corn was field-shelled. From 1965 to 1968 off-farm movement (includes both sales and storage) during harvest increased from 12.2 percent to 18.2 percent (13). This change has increased both the demand for and the price of storage.

Pre-harvest purchases, especially by exporters, have a significant influence on the basis. With the rapid increases in exporting of both corn and soybeans over recent years, the early purchases have been large. Hieronymus stated that pre-harvest purchases of cash grain have been greater than pre-harvest sales of cash grain by farmers (11, p. 10). This situation has put merchandisers into the position of having sold grain in the cash market and bought futures.

After harvest time, the location of the stocks of grain dominate the cash to futures and futures to futures price spreads. The delivery provisions on the Chicago Board of Trade require a Chicago warehouse receipt be

surrendered to the buyer. Because of this, the stocks in Chicago appear to have a greater impact on the basis and spreads than stocks in other locations since they are in deliverable position to take advantage of any abnormal relationships.

The country elevator operator who is hedging stocks in locations other than the delivery point must evaluate his own local supply-demand situation in respect with the supply-demand conditions at Chicago. Small Chicago stocks in relation to Chicago demand to meet delivery commitments would indicate Chicago merchants will be searching for a new supply source. They will bid up cash prices in Chicago; perhaps making it profitable to ship corn in from farther out. This may result in the basis becoming abnormally narrow. On the other hand, large Chicago stocks tend to drive down cash prices or widen the basis. Hedges can then be kept in nearby delivery months in the expectation of a narrowing basis.

The basis patterns for corn and soybeans over the last few years have generally been compatible with the behavior indicated by the theory of the basis as discussed above. The basis is a representation of the market price for storage. The price of storage is determined by the supply and demand for warehouse space for grain. If the demand for storage is great in relation to the supply of space, the price will be driven up and the basis will increase or widen. A wide or large basis would exist when the storage space available has not increased but the crop size is greater than normal. If extra storage would come into availability or an abnormally small crop was harvested, the basis would narrow because the price of storage would decrease. Warehousemen may accept less than normal storage payment rather than let space go idle or empty.

Thus far the discussion of hedging has been limited to reducing price risks for stored grain. There are other uses of the principles of hedging which need to be considered. One of the alternatives is to make forward sales to a processor or a grain merchant and then cover or offset the trade by purchasing a futures contract. This is referred to by Gold (7, p. 128) as a "buying hedge". Hedging is briefly defined as the establishment of a position in the futures market opposite to a position in the cash market and this is exactly what is being suggested. A warehouseman may be offered what he feels to be an extremely lucrative bid for grain delivered four or five months distant. All of the stocks owned by the warehouseman might be already committed in other ways and he may have no space left to store any additional purchases to accept the offer. If the forward sale is made, it is feasible that cash grain prices could advance considerably so that when the physical grain is purchased to meet the commitment, it might actually result in a loss to fulfill the obligation. If a distant futures contract is purchased at the time the forward sale is made, the futures price should rise with the cash. The profit from the futures position would offset the increase in the cash price. Table 5 shows what might happen when the basis is constant. Again profit is computed by buying basis minus selling basis. In Table 5 the warehouseman had to pay ten cents more for the grain than he sold it for, but the futures price had increased an equal amount to neutralize this. If the futures contract had sold for $2.70 instead of $2.80, the gain on the futures contract would have been zero and the net would have been a loss of ten cents per bushel. The buying basis would have been only ten cents versus a selling basis of twenty cents for a loss of ten cents per bushel.

Table 5. Results of a buying hedge

Cash market		Futures market		Basis
Sell	$2.50	Buy	$2.70	$.20
Buy	$2.60	Sell	$2.80	$.20
Loss	$ .10		$ .10	0

On a buying hedge, the hedger expects the basis to remain constant or widen. If the basis widens with cash price increasing, the profit on the futures contract is greater than the loss on the cash position. Assume that the futures contract had sold for $2.90 in Table 5 with other prices as given. Because the buying basis would be thirty cents in this situation, the net result is a gain of ten cents per bushel.

Under the assumption of decreasing cash prices, a constant basis would result in the gain in the cash position being exactly offset by the loss or decrease in futures price. A widening basis with decreasing cash prices yields a gain in the cash position greater than the loss in the futures position because, under the assumption, the cash price could only be falling faster than the futures price or the cash price falling with the futures price increasing. The buying hedge could be utilized profitably when the basis is narrow and it will be widening soon. Before entering into a buying hedge, careful consideration should be given to the profit potential. There must exist a reasonable opportunity for the basis to widen.

Hedges cannot be placed until the cash grain is purchased from the farmer or a forward sale is made in the cash market. It is a prerequisite

Table 6. Results of strategy suggested by Hieronymus

Cash market	December futures	July futures
Buy 5,000 bu. @ $1.00	Buy 5,000 bu. @ $1.15	Sell 5,000 bu. @ $1.30
Sell 5,000 bu. @ $1.00	Sell 5,000 bu. @ $1.20	Buy 5,000 bu. @ $1.20
0	Gain $ .05	Gain $ .10

for hedging that there be a position in the cash market to be offset by a trade in the futures market. This timing depends on when the farmer decides to sell his grain and is out of the hands of warehousemen. The timing of the commitment of storage space from December to July is in the hands of the country elevator operator. Hieronymus (11, p. 30) has suggested a possible method of doing this. If the operator decides he will buy 100,000 bushels of corn during harvest, he can take advantage of the December-July carrying charge or spread in prices by buying 100,000 bushels of December futures and selling 100,000 bushels of July futures any time he elects from July on into harvest. Then as he buys cash corn during harvest, he sells December futures and maintains a hedge by the July futures automatically. The operation begins as a spread taking opposite position in two delivery months to gain from a shift in the price differences or carrying charges.

Table 6 gives a hypothetical example of this strategy for corn considering a 5,000 bushel trade.

If hedging can be defined as making a transaction in the futures market in lieu of a transaction in the cash market (21, p. 560), then this strategy

qualifies as hedging. It begins as a spread by buying December corn and selling July corn in the futures market. The reasoning behind this strategy is that at a given time there exists an inter-temporal price relationship between prices applicable to different times (23, p. 1254). The spread or price relation between December and July corn should be representative of the July corn basis or the July futures minus central Iowa cash. When the spread is wide as in Table 6, the basis should be wide also. There may be limited cash corn available to take advantage of this wide basis so a spread is initiated. If the cash price goes up between the time the spread is placed and the cash corn is bought, the December price should rise along with it to offset any premature narrowing of the July basis. On the other hand, the cash price could fall during this same period but the December price decrease would result in offsetting this widening of the July basis. The July basis referred to here is the July futures price on the day the spread was initiated minus the cash price at which the corn is bought.

These offsetting effects tend to equilibrate price changes. Any price change in the December futures position is offset by selling a July contract in lieu of a sale in the cash market as for the buying hedge as discussed previously. At harvest time the farmers are willing to sell corn. The warehouseman buys cash corn and the purchase is automatically hedged by the July contract sold earlier.

Hieronymus also suggested a similar strategy for soybeans. The spread between the November futures and the May futures is the relevant relationship to be observed for soybeans. When this spread becomes greater than normal charges, Hieronymus recommends placing a spread and then later turn the spread into a hedge.

PROCEDURE

This study involves the analysis of daily grain prices from October 1, 1963 to October 1, 1968. The daily closing prices of the Chicago Board of Trade were used as the source of futures prices for corn and soybeans. In the case of corn, the prices for each of the five contracts traded were taken from the annual report of the Chicago Board of Trade (2). Only five of the seven contracts of soybeans are reported in the annual report of the Chicago Board of Trade. This made it necessary to use the Wall Street Journal (6) to supplement the other source.

The cash or spot prices were taken from two different sources. Central Iowa cash prices from the Des Moines Register (1) were used for the price which country elevators pay for the grain bought from the farmers. The Des Moines Register receives this price information from a group of cooperating grain elevators in central Iowa. Nearby Chicago to-arrive rail bids from Farmers Grain Dealers Association (18) in Des Moines, Iowa were used for the price at which the elevator could sell its corn. The bid used for corn was the price Farmers Grain would pay for corn shipped on a Chicago rail billing. The corn may or may not ever actually reach Chicago but the country elevator would pay the railroad the cost of transporting the corn to Chicago and Farmers Grain Dealers Association would instruct the railroad where to ship the corn. In order to reduce the Chicago to-arrive bid into a track bid, rail transportation charges must be deducted. From the beginning of the period under study until March 4, 1968, transportation was deducted at $.2016 per bushel. On March 4, 1968, Farmers Grain began bidding for corn on a new billing referred to as a one-transit rate. This

reduced the amount of flexibility allowed in shipping but it also reduced the cost. The new one-transit rate to Chicago from central Iowa used in the study is $.1425.

For purposes of this study, Farmers Grain's bids for soybeans were used. This bid is what Farmers Grain is willing to pay for "track" beans or beans loaded on a rail car at the country elevator. All freight charges for beans from that point to final destination are paid by Farmers Grain Dealers Association. Therefore, it was not necessary to make any price adjustment for soybeans.

The next step was to establish the basis for each commodity and each contract. An average daily basis is computed for each week of the crop year by accumulating a total basis for the week and then dividing by the number of days which the Chicago Board of Trade was in operation. This same procedure was followed to arrive at the average daily basis for each contract and each grain during every week of the five year period under study. These calculations give an indication of what the potential storage income was during the five crop years under study. The value under consideration comes originally from the relationship existing each day between central Iowa cash prices and each of the various contracts traded in the respective grain on the Chicago Board of Trade. This shows the basis or price difference at which a country elevator buys corn and soybeans from the farmer, but does not yield the basis when the country elevator sells its inventories to Farmers Grain Dealers Association. Both the buying basis and the selling basis are needed to reconstruct the profits on losses which an elevator might have experienced.

The potential storage income for grain purchased each day was computed

in the following manner. First, the basis is computed for the day the grain is purchased by subtracting the central Iowa cash price (representing the purchase price of the grain) from the closing price for each of the contracts trading on the Chicago Board of Trade the day the elevator bought the grain. This is the basis referred to in this study as the "buying basis" or B1. In order to compute the "selling basis", B2, or basis on the

$$B1 = F_1 - C_1 \qquad 1$$

day the grain was sold some assumptions need to be made as to the duration of storage. The analysis presented here is based on not just a single length of storage but takes into consideration periods of storage of 15, 30, 60, 120, and 150 days. Some clarification needs to be made at this point as to how these "days" are counted. The summation includes only those days when the Chicago Board of Trade is in operation. For example, the five day storage would represent a normal week in this study as far as the actual calendar days. Storage of grain for a sixty day period is equal, due to this method of counting days, to approximately a twelve week storage length. It is important that these "days" are not confused with the more common definition. In this study a week consists of the number of consecutive days the Chicago Board of Trade is open for business. This definition of time came about to facilitate analysis by a computor. It was felt that a meaningful division of the normal crop year would be to divide it into weeks.

The selling basis was computed for the last day of the storage period by deducting the price offered by Farmers Grain Dealers Association (adjusted to a "track" bid if necessary) from the closing price of each contract of the particular commodity traded on the Chicago Board of Trade.

Then the selling basis is subtracted from the buying basis to arrive at the

$$B2 = F_2 - C_2 \qquad 2$$

potential storage earnings (P1) for grain purchased each day. The potential earnings are recorded by the purchase date rather than sale date because the purchase date is an independent variable with the sale date determined by length of storage. If the basis has narrowed during storage, the result of the calculations would be positive which is to be interpreted as a profit attributed to storage activities. When the buying basis minus the selling basis results in a negative quantity, the interpretation is that the storage hedge has resulted in a loss because the basis has widened.

$$P1 = B_1 - B_2 \qquad 3$$

For each business day of the Board of Trade, potential profits or losses were computed for hedging grain storage through each of the five corn contracts or each of the seven soybean contracts traded during the period. At the same time as these calculations were made, the income was estimated for an elevator which did not hedge its inventories against price changes. This was done by subtracting the cash price (C_1) at which the elevator bought the grain from the price (C_2) which Farmers Grain Dealers paid the country elevator as shown by Equation 4. Again, as in the case of hedging, it was necessary to deduct transportation costs. When this difference is positive, the storage was profitable and a negative value indicates a loss due to storage as shown by Equation 4 where P2 is the gross profit staying unhedged.

$$P2 = C_2 - C_1 \qquad 4$$

The results of these two series of calculations indicate income poten-

tial from storing grain purchased on any particular day during the five year period. Under the assumption that grain is bought from the farmers according to the central Iowa cash price and is sold to Farmers Grain Dealers Association at the Chicago price on the last day of the storage period, the results of hedging the inventories can be compared to staying unhedged or open during the storage period. The results for each day show the profit or loss resulting from buying grain on that day and selling at the end of storage a given number of "days" in the future.

These daily profits or losses are averaged for each week of each crop year to arrive at a daily average income for each week due to both hedging and not hedging. For example, the storage income is totaled for hedging on each contract and for staying open, and then the total for each contract and the total for staying unhedged are separately divided by the number of

$$X_1 = \frac{\sum_{i=1}^{D} P1_i}{D} \qquad 5$$

$$X_2 = \frac{\sum_{i=1}^{D} P2_i}{D} \qquad 6$$

days in the week. Equations 5 and 6 show the average daily income generated through buying grain, putting it into storage, and selling it at some future date where X_1 and X_2 are the averages for hedged and open storage respectfully and D is the number of business days in the week.

The computations to this stage had been carried out to consider hedging corn on every one of the five corn contracts and hedging soybeans on every one of the seven soybean contracts. Due to the regulations of futures trading on the Chicago Board of Trade, a contract ceases to be traded eight

business days before the end of the month in which delivery is to be made. During the storage period, one or more of the contracts considered may expire. This expiration makes it impossible to maintain an offsetting position at all times. Also, when the contract begins to be traded again in the month following delivery, the new delivery month is almost a year away which may tend to weaken the price relationship to the cash market. In order to eliminate the changing of delivery months, a table was developed showing for each length of storage the average daily earnings for hedging in the first contract expiring after the last day of the proposed storage period and the earnings for storing grain the same period unhedged. For example, soybeans bought the first week of November for a planned storage of thirty days would not be hedged on a November contract on this assumption, but a January contract would be sold to hedge this purchase. The November contract would expire at the end of that month so it could not be used to cover the full storage period.

After a table was made for each length of storage listing the daily average income, both hedged and open for every week of the five crop years, the individual years were divided into quarters. A mean daily income for the five year period was computed for each quarter and standard deviations were computed for both hedged and open storage for each of the storage periods. The means and standard deviations can be used to analyze the merit of hedging.

At all times in this procedure the earnings or income generated by storing grain is a gross income measure. From this estimate must be deducted such expenses as cost of storage space, insurance, interest, and, in the case where hedging is used, the brokerage fees.

The discussion of the procedure used has thus far centered on the selling hedge which involves the sale of futures contracts to protect against price risks in the cash market. Another use of hedging could also be put to work by a country elevator. This was referred to earlier in this study as a buying hedge. A buying hedge describes a situation where futures contracts are purchased to offset price risks involved in making a forward sale in the cash market. The selling hedge strategy can be used correctly only as long as the warehouseman is short in the cash market or has sold grain on a to-arrive contract but does not have the physical grain stocks in storage.

The sources of information used in this study did not facilitate an extensive analysis of the buying hedge. No consistent bid could be determined for distant sales in the cash market each day for corn.

A random sample was taken from the period under observation and results were calculated in an attempt to simulate what might have happened. For example, a day is selected on which Farmers Grain Dealers Association is bidding for corn to be delivered several weeks distant. The price of the futures contract expiring first after delivery date is recorded and the basis computed. A day fairly close to delivery time is selected and the central Iowa cash price recorded along with the price of the futures contract used to hedge the transaction. This gives the necessary prices to evaluate the profitability of the buying hedge. The basis on the day the forward sale was made is computed by Equation 7, where B_1 represents the basis, F_1 represents the price of the futures used as a hedge, and C_A is

$$B_1 = F_1 - C_A \qquad 7$$

the price in the cash market for grain delivered at a later date. The

basis is also calculated for the day when the grain is purchased to meet the obligation in the cash market. The formula used for this basis was:

$$B_2 = F_2 - C_I \qquad 8$$

where B_2 represents the basis for that day, F_2 is the futures price of the contract used to hedge, and C_I is the price of corn in central Iowa or the price which the warehouseman pays for the corn. Again the formula used to find the net result of the operation is the following:

$$\text{Profit} = B_1 - B_2 \qquad 9$$

The information available for this study allowed some check to be made as to the profitability of this type of hedging for corn sales, but no forward bids were available for soybeans.

Another hedging strategy examined in this study begins with the warehouseman placing a spread. When he buys the cash grain, he sells the closer of the two contracts and is automatically hedged in the distant month. The mathematics for computing the profit from the strategy are somewhat more complex than for the previous methods. On day one the spread is initiated by buying a futures contract for month F1 for a price of $F1_1$, and selling a contract for month F2 for a price of $F2_1$. Later, when the warehouseman buys cash corn for a price of C2, he simultaneously sells the futures contract for month F1 for a price of $F1_2$. The warehouseman then has grain in storage which is hedged in month F2. When the warehouseman sells this grain in storage, he receives the price of C_3 which is the Farmers Grain Dealers Association's Chicago bid less transportation. At that time the warehouseman would buy the futures contract for month F_2 at a price of $F2_3$. Gross profits from this strategy are computed by Equation 10.

$$\text{Profit} = C_3 - C_1 + F1_2 - F1_1 + F2_1 - F2_3 \qquad 10$$

Hieronymus recommended the use of this technique in corn storage (11, p. 30) using the December contract as the F1 month and the July contract for the F2 month. For soybeans Hieronymus suggested using January beans as the F1 contract and the May contract as F2 month. This method is based on the principle that the price difference between distant delivery months should not exceed carrying charges for an extended period.

EMPIRICAL ANALYSIS

The concern of a warehouseman who hedges is focused on any shift in the basis in an attempt to both reduce price risk and increase net income. This study attempts to analyze how successful a warehouseman in central Iowa would have been hedging from October 1, 1963 to October 1, 1968. A basic tool required by a hedger is historical records of the basis for his location. Table 7 shows the five year average basis in central Iowa for each week of the crop year for corn. Table 8 gives this same information for soybeans. The figures in each of these tables represent the average price difference between the central Iowa cash market and the clos ng price of each futures contract for a given week of the crop year averaged over the five crop years studied. Tables 7 and 8 are summaries of the weekly average bases for the individual years listed in Tables 16, 17, 18, 19, and 20 of Appendix A. Table 42 in Appendix B shows the relationship between weeks of the crop year and months. The crop year used for both corn and soybeans ran from October through September.

Comparison of the basis patterns shows a great diversity between years. From the 28th week (middle of April) of the 1965-1966 crop year until the 43rd week (end of July) the December corn basis widened from 7.575 cents to 22.425 cents. The result would have been a loss on a selling hedge. During the same period of the 1967-1968 crop year, the basis narrowed from 19.167 cents to 7.975 cents which would have indicated a profitable hedge. In the earlier of the two years, the December corn basis was abnormally narrow and then became wider prior to harvest. In 1967-1968 the basis was wider than average in the spring and then narrowed to a more

Table 7. Average daily central Iowa corn basis given in dollars for the period October 1, 1963 to October 1, 1968

Week	December	March	May	July	September
1	0.14589	0.18934	0.21362	0.22985	0.20518
2	0.13255	0.17715	0.20140	0.21905	0.19315
3	0.14665	0.19055	0.21630	0.23365	0.20790
4	0.15475	0.20020	0.22935	0.24860	0.22355
5	0.16293	0.20851	0.23745	0.25539	0.23005
6	0.16419	0.20998	0.19297	0.25805	0.23355
7	0.16505	0.21060	0.24005	0.25975	0.23575
8	0.16656	0.21185	0.24075	0.23990	0.23631
9	0.16447	0.20767	0.23676	0.25547	0.23018
10	0.15880	0.19640	0.22450	0.24225	0.21660
11	-[a]	0.17035	0.19745	0.21330	0.18610
12	-	0.15861	0.18651	0.20334	0.17659
13	-	0.15025	0.17981	0.19700	0.16931
14	0.11925	0.15275	0.17959	0.19626	0.16924
15	0.12095	0.15305	0.17955	0.19505	0.16850
16	0.12130	0.15045	0.17600	0.19130	0.16720
17	0.11831	0.14882	0.17514	0.19175	0.16757
18	0.11670	0.14805	0.17445	0.18835	0.16805
19	0.12180	0.14690	0.17495	0.19300	0.17160
20	0.12595	0.13961	0.16704	0.18684	0.17045
21	0.12919	0.13562	0.16525	0.18619	0.17337
22	0.13840	0.13965	0.17115	0.19465	0.18195
23	0.14215	0.14330	0.17345	0.19545	0.18410
24	0.13365	-	0.16648	0.18940	0.17890
25	0.10663	-	0.16169	0.18465	0.17710
26	0.12714	-	0.15301	0.15447	0.16617
27	0.12964	0.16472	0.15006	0.17324	0.16469
28	0.11735	0.15660	0.14102	0.16214	0.15253

[a]Contract was expired during all or some part of the week.

Table 7 (Continued)

Week	December	March	May	July	September
29	0.11211	0.15131	0.13591	0.15458	0.14504
30	0.09905	0.13885	0.12120	0.13980	0.130100
31	0.08935	0.12905	0.11490	0.13290	0.12165
32	0.08865	0.12815	0.12290	0.13635	0.12045
33	0.07925	0.11905	-	0.12710	0.10820
34	0.08010	0.12015	-	0.12400	0.10745
35	0.09213	0.13038	-	0.12694	0.11618
36	0.09840	0.13671	0.16320	0.12790	0.12030
37	0.09830	0.13945	0.16620	0.12665	0.12025
38	0.10410	0.14915	0.17075	0.13215	0.12390
39	0.11220	0.15415	0.17950	0.13400	0.13045
40	0.10494	0.14669	0.17156	0.13277	0.12513
41	0.11775	0.16040	0.18555	0.14390	0.13435
42	0.11861	0.16125	0.18690	-	0.13455
43	0.114800	0.15610	0.18220	-	0.13295
44	0.11107	0.15325	0.17820	-	0.12870
45	0.12150	0.16620	0.19205	0.20895	0.13555
46	0.12870	0.17330	0.20140	0.22160	0.14280
47	0.12440	0.17020	0.19805	0.21860	0.13940
48	0.11425	0.16155	0.18990	0.21085	0.13390
49	0.11223	0.16010	0.18851	0.20943	0.12951
50	0.11561	0.16176	0.18970	0.20940	0.13438
51	0.11239	0.15755	0.16435	0.20460	-
52	0.11801	0.16351	0.18580	0.21309	-

Table 8. Average daily central Iowa soybean basis in dollars for the period October 1, 1963 to October 1, 1968

Week	January	March	May	July	August	September	November
1	0.21920	0.25658	0.28167	0.29294	0.25914	-[a]	0.18027
2	0.22390	0.25765	0.28250	0.28970	0.25525	-	0.18805
3	0.22695	0.26025	0.28365	0.29150	0.25300	-	0.19055
4	0.22810	0.26240	0.28860	0.29760	0.25975	0.15980	0.18855
5	0.22201	0.25751	0.28401	0.29297	0.25335	0.12037	0.18236
6	0.21286	0.26634	0.27355	0.28146	0.23894	0.11051	0.17991
7	0.19640	0.22370	0.24870	0.25365	0.21295	0.07250	-
8	0.18232	0.20806	0.23135	0.23984	0.20459	0.07802	-
9	0.18251	0.20596	0.22831	0.23795	0.20326	0.08133	-
10	0.17245	0.19080	0.21315	0.21845	0.18200	0.07040	0.03575
11	0.17095	0.19115	0.21280	0.21740	0.18145	0.07175	0.02865
12	0.16590	0.18784	0.21119	0.20557	0.17675	0.06119	0.01598
13	0.165814	0.18712	0.21019	0.19963	0.17500	0.05800	0.01413
14	0.17797	0.19040	0.21240	0.21034	0.17830	0.06435	0.01813
15	0.17010	0.18965	0.20755	0.21070	0.17280	0.04890	-0.03200
16	-	0.19315	0.21380	0.21815	0.17545	0.04110	-0.01590
17	-	0.19088	0.20947	0.21424	0.17214	0.03194	-0.02974
18	-	0.18137	0.19595	0.19892	0.16035	0.02402	-0.02582
19	0.01755	0.18390	0.19895	0.20505	0.16805	0.03150	-0.01570
20	0.03590	0.17633	0.19658	0.20094	0.16976	0.04544	0.00109
21	0.03944	0.17538	0.19619	0.20012	0.16469	0.04837	0.00419
22	0.04800	0.16820	0.19555	0.20555	0.17300	0.05470	0.01265
23	0.03370	0.16790	0.19060	0.19935	0.16680	0.03945	-0.00230
24	0.04667	-	0.18197	0.19187	0.15632	0.04822	0.01177
25	0.03407	-	0.17408	0.18172	0.14985	0.03410	-0.002312
26	0.02556	-	0.17039	0.17454	0.14059	0.02543	-0.00941
27	0.02921	0.07249	0.16809	0.17342	0.14451	0.03015	-0.00634
28	0.03593	0.06320	0.16770	0.17277	0.14626	0.03677	-0.00263

[a]Contract was expired during all or some part of the week.

Table 8 (Continued)

Week	January	March	May	July	August	September	November
29	0.02470	0.05449	0.16531	0.16788	0.14154	0.02621	-0.00263
30	0.03260	0.06460	0.16250	0.17120	0.14545	0.03495	0.00150
31	0.03725	0.06980	0.16095	0.17325	0.14860	0.03690	-0.00075
32	0.03450	0.06425	0.16630	0.17125	0.14640	0.03450	-0.00305
33	0.03060	0.06345	-	0.16910	0.14290	0.02800	-0.00690
34	0.03180	0.06490	-	0.17090	0.14545	0.03195	-0.00630
35	0.01777	0.04925	-	0.16756	0.13996	0.02654	-0.01867
36	0.018150	0.05180	0.07315	0.17110	0.14885	0.03010	-0.01720
37	-0.01065	0.02225	0.04430	0.16525	0.13075	0.00335	-0.04795
38	-0.04555	-0.01330	0.00910	0.16405	0.11950	-0.02095	-0.18325
39	-0.05620	-0.02415	-0.00275	0.16465	0.12210	-0.031500	-0.09445
40	0.03081	0.00031	0.02275	0.17325	0.13131	-0.01619	-0.07194
41	0.00485	0.03890	0.03890	0.18150	0.13855	0.03782	-0.03325
42	0.03100	0.06290	0.08425	-	0.14240	0.03580	-0.00690
43	0.04615	0.07765	0.09740	-	0.15185	0.04940	0.00865
44	0.02545	0.05820	0.08203	-	0.15745	0.04195	-0.01090
45	0.02205	0.05490	0.07090	0.08985	0.16855	0.04245	-0.00970
46	-0.00275	0.03100	0.05510	0.06640	-	0.02785	-0.04020
47	-0.02750	0.02795	0.05230	0.06320	-	0.04910	-0.04070
48	-0.00165	0.03350	0.05670	0.06645	-	0.05020	-0.03985
49	0.0353	0.06839	0.09316	0.10291	0.07326	0.05969	-0.00756
50	0.13730	0.17389	0.19922	0.20915	0.17840	0.15730	0.09864
51	0.12015	0.15595	0.17905	0.18795	0.15545	-	0.08165
52	0.14911	0.18465	0.20956	0.21679	0.18471	-	0.10391

reasonable level.

The basis for soybeans is much more variable. For example in Table 28 of Appendix B, the January soybean basis in week 52 of the crop year ranged from -4.094 cents in the 1964-1965 crop year to 23.800 cents during 1963-1964. The daily average January soybean basis ranged in the 1965-1966 crop year from -36.725 cents to 23.025 cents. Such moves in the basis represent extensive gains or severe losses to a hedger depending on the type of hedging strategy used and the timing in the placement of orders in the futures market and action in the cash market.

The preceding discussion gives some indication as to the profit potential as a result of hedging grain storage operations. An obvious answer deducted from the basis patterns is that hedging does not remove the risk of loss completely. The final step is to compare the gross income using hedging to the gross income without hedging.

Tabulation of Results

Listed in Tables 21, 22, 23, 24, and 25 of Appendix A are the average revenues for the various lengths of storage both hedged and open for corn. The same information for soybeans is shown in Tables 35, 36, 37, 38, and 39 in Appendix B. The hedges used in computing these figures were placed in the delivery month which expires first after the date the grain is sold. These figures estimate the average daily income during each week for all of the five years. The average income generated during week number 3 of 1965 by buying soybeans in central Iowa, storing them for 150 days, and selling them to Farmers Grain Dealers for the price bid the last day of storage is shown in Table 37 of Appendix B as 12.225 cents per bushel hedged in the

stipulated month or 64.5 cents per bushel staying open for the period of storage.

Next a five year average for each week for hedging and not hedging both corn and soybeans was computed. The five year weekly averages were then totaled and divided by the number of weeks to arrive at a daily average revenue. Tables 9 and 10 contain the means arrived at through this process and the standard deviations over the 1963 to 1968 period used in this study.

The buying hedge, as discussed previously, could not be reconstructed for soybeans nor could an exhaustive simulation be set up for corn. The results calculated for the random days checked are given in Table 11. This method of hedging is not used extensively by country elevator operators as yet. The buying hedge lends itself more readily to use by terminal elevators or grain processors.

The third method of hedging investigated in this study is the strategy of entering into a spread and then converting it to a hedge. Spot checks were made by applying this strategy each summer when the appropriate spread was at a maximum. These results are presented in Tables 12 and 13.

Using the data reported in Table 9, it is possible to test the hypothesis that average gross income for hedged storage is less than or equal to the average gross income for unhedged storage of corn. The alternative hypothesis is that hedging does increase the average gross income for storing corn. As a test, a t ratio was computed for each length of storage under the assumption that the variances in income are not equal. For all lengths of corn storage considered, the null hypothesis is rejected at the

Table 9. Statistical summary of corn storage revenues in central Iowa, October 1, 1963 to October 1, 1968

Days of storage	Average earning c/bu.	Standard deviation c/bu.	t ratio	-[a]	Variance	Variance ratio	-[b]
15							
Unhedged	.530	3.748			14.048		
Hedged	1.186	2.788	2.262	$P < .025$	7.773	1.807	$P < .0005$
30							
Unhedged	.776	5.317			28.271		
Hedged	1.687	4.093	2.144	$P < .025$	16.753	1.687	$P < .0005$
60							
Unhedged	1.159	7.109			50.538		
Hedged	2.593	5.311	2.543	$P < .025$	28.207	1.791	$P < .0005$
120							
Unhedged	.469	12.976			168.377		
Hedged	4.141	7.748	3.7203	$P < .0005$	60.032	2.804	$P < .0005$
150							
Unhedged	-.357	10.593			112.212		
Hedged	3.621	8.174	4.502	$P < .0005$	66.814	1.679	$P < .0005$

[a] In this column P is the probability of observing t ratios as large in absolute value as those found for a sample of 200 from each of two populations with hedged income $\leq$ unhedged.

[b] In this column P is the probability of observing variance ratios as large as those found for a sample of 200 from each of two populations with equal variances.

Table 10. Statistical summary of soybean storage revenues in central Iowa, October 1, 1963 to October 1, 1968

Days of storage	Average earning ¢/bu.	Standard deviation ¢/bu.	t ratio	-[a]	Variance	Variance ratio	-[b]
15							
Unhedged	1.872	11.973			143.353		
Hedged	.947	6.773	1.079	$P < .15$	45.874	3.160	$P < .0005$
30							
Unhedged	2.420	16.373			268.075		
Hedged	.736	9.307	1.425	$P < .10$	86.620	3.094	$P < .0005$
60							
Unhedged	1.690	23.699			561.643		
Hedged	1.612	11.683	.046	$P < .25$	136.492	4.114	$P < .0005$
120							
Unhedged	1.468	32.366			1047.558		
Hedged	-2.974	15.604	1.975	$P < .025$	243.485	4.302	$P < .0005$
150							
Unhedged	1.546	36.059			1300.251		
Hedged	-4.785	17.099	2.401	$P < .025$	292.376	4.447	$P < .0005$

[a] In this column P is the probability of observing t ratios as large in absolute value as those found for a sample of 200 from each of two populations with unhedged income $\leq$ hedged.

[b] In this column P is the probability of observing variance ratios as large as those found for a sample of 200 from each of two populations with equal variances.

five percent level. The conclusion is that hedging does increase the income for storing corn.

Shown in Table 10 are the t ratios computed to compare hedged storage to unhedged storage of soybeans. Again the assumption is made that the variances are not equal. The null hypothesis is that unhedged storage results in a gross average storage income less than or equal to the gross average storage income for hedged storage of soybeans. The alternative is that unhedged storage increases the gross average storage income over hedged storage. For the fifteen, thirty, and sixty day storage periods the null hypothesis cannot be rejected at the five percent level. Hedging is shown at the five percent level to reduce the average gross storage income for soybeans for the 120 and 150 day periods of storage.

Theoretically, hedging reduces the price risk involved in grain storage. In this study the standard deviation (or equivalently the variance) of the storage revenues are used as a measure of risk. The standard deviations are reported in column two of Tables 9 and 10 for corn and soybean storage respectively. In every case the standard deviation was less with hedging than without hedging. In order to test the hypothesis that hedging results in decreasing the variability of storage income, F ratios were computed for each length of storage by dividing the variance of income without hedging by the variance of income with hedging. These ratios are reported in column 6 of each table. The probability of finding variance ratios larger than the observed values under the hypothesis were obtained from a table of the F distribution. These probability limits are

Table 11. To-arrive sales of corn with income given in dollars per bushel

Date sold	Date bought	Gross income
11-30-67	12-22-67	.03590
9-27-67	12-8-67	-.06285
10-19-67	1-2-68	.02340
12-30-66	3-10-67	.03590
8-18-66	11-25-66	.03615
1-24-68	3-15-68	.00595
3-8-65	5-28-65	.00010

reported in column 7 of each table. Observed variance ratios as large or larger than those found for corn and soybean storage could be expected not more than .05 percent of the time if hedging is equally as variable as not hedging.

A central Iowa grain elevator operator must keep in mind the outside influences which affect the basis. It is important that he understand all of the elements of supply and demand which are involved in making the basis. Crop predictions and indications such as acres out of production, planting intentions and weather conditions early in the growing season are factors on the supply side in addition to the stocks of grain presently held. Also, carryover of the old crop into the next year results in increasing the supply. Demand for grain could be divided into domestic utilization

Table 12. Results of converting a spread into a hedge for corn storage

Crop year	Week spread is placed	Week converted to hedge	Week hedge is lifted	Income from spread[a]	Income by hedging on July[a]	Gross income[a]
63-64	6	11	30	2.125	8.465	10.590
63-64	46	1[b]	36[b]	0.750	9.995	10.745
63-64	46	9[b]	36[b]	-.250	7.465	7.215
63-64	46	10[b]	36[b]	.125	3.215	3.340
64-65	1	9	36	-1.000	7.465	6.465
64-65	1	10	36	-0.625	3.215	2.590
64-65	51	9[b]	31[b]	1.875	9.340	11.215
65-66	49	10[b]	39[b]	5.000	12.715	17.715
66-67	51	8[b]	41[b]	1.125	20.875	22.000

[a]Income is given in dollars per bushel.

[b]Week of the following crop year.

and grain for export purposes. Estimates of domestic use come, essentially, from the sum of grain for human consumption, for livestock feed, and for seed. The export demand depends on the production and consumption of grains in other parts of the world.

In appraising the basis for a particular case, all factors of supply and demand must be considered simultaneously to be effective. Examination of a single factor or even one side of the two-fold problem could be risky. Predictions of a large crop, if examined alone, would indicate that the basis will be widening. Simultaneously, a much smaller than normal carry-over, increased livestock feeding, and drought in foreign grain producing

Table 13. Results of converting a spread into a hedge for soybean storage

Crop year	Week spread is placed	Week converted to hedge	Week hedge is lifted	Income spreading[a]	Income hedging[a]	Gross income[a]
63-64	5	6	26	.125	23.375	23.500
63-64	51	3[b]	31[b]	1.750	12.500	14.250
65-66	2	4	25	0.500	9.875	10.375
65-66	52	3[b]	13[b]	6.125	15.750	21.875
66-67	45	2[b]	31[b]	2.375	15.375	17.750

[a]Income is given in dollars per bushel.

[b]Week of the following crop year.

areas signal a narrowing basis as a final result. Factors may or may not be offsetting but they must be considered as a group to form a conglomerate net result.

The author feels that this type of an appraisal should be made when selecting the best strategy. An analysis must be made to determine the potential for a wider basis and the potential for a narrower basis. The strategy selected will be the one showing the "best" profit potential. To one firm, "best" may be the greatest dollar amount and also the biggest risk. To another firm, "best" may be a smaller, more certain profit. A warehouseman would generally find it unprofitable to store corn into a new crop year with a large crop predicted. The basis would be widening, usually. In a year when demand has increased or shows signs of doing so or carryover is negligible, a warehouseman may find this to be extremely profitable.

Weather conditions should also be observed. Late planting and/or little subsoil moisture tend to reduce the crop size. Certain temperature-moisture relationships are favorable while other situations are quite unfavorable. As a result of changes in these factors, the basis will change. At harvest time, weather varies the number of days required to harvest the crop. Favorable harvest conditions permit rapid work resulting in a huge movement of grain from the field to storage within a short time. This results in a widening of the basis because elevators are reluctant to bid aggressively when receiving grain so rapidly. When weather conditions slow up harvest progress, the basis may narrow as country elevators begin to bid up prices in order to have grain to meet commitments.

SUMMARY AND CONCLUSIONS

Merchandising Corn

Some general statements can be made concerning the mean gross storage incomes and standard deviations listed in Table 9. For all storage lengths considered the overall mean gross storage income for the five year period improved between when hedging is used and when it is not used for corn storage. The standard deviations are less for hedged inventories though. The net effect of hedging corn storage operations during these five crop years has been to increase gross storage earnings and decrease the variability of these revenues.

The information given in Table 14 shows the number of weeks each year when the average daily gross income for hedged storage exceeds the average daily gross income for unhedged storage. The most recent two years of the period studied (1966-1967 and 1967-1968) were profitable years for hedging corn storage. Tables 16 through 20 show that the basis during these years followed a path consistent with the theory of carrying charges.

The income generated from a buying hedge is shown in Table 11 for corn. The income ranges from positive to negative or from profit to loss. The results of these spot checks indicate that selling to arrive has not been as profitable as storing grain. At times, though, the buying hedge is quite profitable.

Use of a spread which is later turned into a hedge results in the profits as shown in Table 12. The corn spread used is the relation between the December and July contracts. The five year average spread for each week is shown in Table 27. This hedging strategy appears to have been

Table 14. Number of weeks when hedging is more profitable than not hedging for corn storage

Crop year	Days of storage 15	30	60	120	150
63-64	32	31	29	23	18
64-65	24	27	26	21	21
65-66	22	19	22	15	14
66-67	36	41	46	51	52
67-68	40[a]	37[b]	34[c]	27[d]	21[e]

[a]Out of 49 weeks considered.

[b]Out of 46 weeks considered.

[c]Out of 40 weeks considered.

[d]Out of 27 weeks considered.

[e]Out of 21 weeks considered.

very profitable in the spot checks made. Again the results are due to the fluctuations of the basis. This strategy depends on the December corn basis, the July corn basis, and the spread between these two delivery months.

Soybean Merchandising

Table 10 shows that, for the shorter lengths of storage, the selling hedge for soybean storage had decreased the gross average income and reduced the standard deviation of the income. In general, it shows that the storage of soybeans over the five year period has not been profitable. The storage space could have been utilized more profitably by storing corn.

Table 15. Number of weeks when hedging is more profitable than not hedging for soybean storage

Crop year	Days of storage 15	30	60	120	150
63-64	28	32	31	23	19
64-65	27	23	27	23	22
65-66	15	13	14	14	16
66-67	33	35	51	50	52
67-68	27[a]	26[b]	32[c]	26[d]	21[e]

[a]Out of 49 weeks considered.

[b]Out of 46 weeks considered.

[c]Out of 40 weeks considered.

[d]Out of 27 weeks considered.

[e]Out of 21 weeks considered.

Examination of Table 10 shows that storage of soybeans has been extremely profitable at times but quite costly in other situations.

The longer lengths of soybean storage are on the average less profitable than the shorter storage. This implies that a warehouseman storing soybeans should turn his inventory rapidly for increased profit over the long run. Certainly, there are situations as shown by Tables 35 through 39 when the longer periods of storage increase gross profits by taking full advantage of basis or cash price fluctuations.

Table 13 lists the results of the analysis made on the use of a spread to initiate a hedge. The spread used for soybeans is the November-May

spread. This strategy has been very profitable for each of the five years studied. In fact this method appears to show more promise than use of the selling hedge.

Implications of the Study

Referring again to Table 9, this information also gives some insight as to the most profitable length of storage to use for corn. Considering the relation of average daily gross income for different lengths of storage, the turning ratios must be evaluated. Four bushels of grain could be stored for fifteen days each in the same amount of space required to store one bushel for sixty days. This can be done by turning the inventory four times or once every fifteen days for a total of four turns in a sixty day period. Multiplying the five year average daily gross storage income for the fifteen day storage period by four gives the total gross income potential. To directly compare this product with the gross income for a sixty day storage period is not valid. Extra costs are also generated as a result of turning the inventory four times. More handling costs and more brokerage fees are involved. The additional commissions alone would cost one and a half cents. Handling costs vary with elevator, but would be a significant factor in reducing the net profit potential. Each elevator operator would need to analyze these additional expenses on the basis of his cost structure. A similar process is recommended for storing soybeans.

The author would recommend that a warehouseman be aware of what his basis is. The warehouseman should initially compare the basis on any given day with the basis which existed in previous years. The mere fact that the basis is wider than average does not imply a good profit from a selling

hedge. In fact the basis may continue to widen, netting a loss for the storage hedge. The warehouseman needs to include in his analysis the underlying reasons for the abnormal size of basis be it larger or smaller than average. He may then find that a similar situation prevailed in some earlier year. By studying the basis pattern for the earlier year and the underlying reasons for the movements, the hedger gains additional knowledge. The appraisal of the basis can be redone as the basis pattern deviates from that of a previous year.

As stated above in this study, hedging is not always done to reduce price risk. If the basis holds constant during the storage period, the net result is zero profit. All risk has been removed but no profit has been generated to cover the costs of storage and hedging. A hedger is expecting to profit from favorable changes in the basis. He may begin to select those days when favorable changes in the basis appear likely to place his hedge. At other times the warehouseman may choose to stay open. The determining element in the decision is the possibility of change in the basis. If a wider basis appears likely in the near future, a hedger would profit by initiating a buying hedge. A narrowing of the basis in the near future would be profitable with a selling hedge. As shown in this study, the fluctuations of the basis determine the profit or loss of a hedger.

Limitations

As discussed earlier, the price which a warehouseman received for grain he sells during the five year period under study was taken from the records of Farmers Grain Dealers. The implied assumption is that these bids are representative of the cash grain market. On any given day the bid

may be fractionally higher or lower than competitors are bidding. Farmers Grain Dealers Association is a cooperative and is limited to marketing only its members' grain. The members on the other hand are not restricted to marketing grain only through Farmers Grain Dealers Association. The member elevator would and should consider bids offered by other firms interested in buying grain. Unless Farmers Grain Dealers makes a competitive offer, they would buy no grain.

Each firm in the grain trade forms separate opinions as to the direction of price movement. Some firms may be optimistic, some pessimistic, and some neutral on any given day. At other times, cert in firms may or may not need grain to fulfill prior commitments. All of these factors enter into the make-up of the competitive quality of grain bids.

To increase the accuracy of the reconstruction of hedging opportunities, it would be necessary to compile all of the bids offered to a warehouseman on every day. From among these bids the one best offer which yields the highest net return would be used as the selling price for that single day. Not only would the bids of competing buyers need to be compared, but bids for different destination would have to be adjusted to show the net price to the warehouseman after transportation costs are deducted. The process of selecting the best bid from among the multiple possibilities of firm and destination would then be repeated for each day of the period under observation.

The price at which futures transactions are made in this study is the daily closing price for the contract on the Chicago Board of Trade. Additional income might be generated by hedging operations if the warehouseman were allowed some degree of flexibility in selecting the time of day to

place his orders in the futures market. No study conducted has reported a bias in the closing prices. Again, due to the competitive qualities of the grain trade, any possible bias existing on a given day would tend to average out over a period of any length. The closing price is used because it is reported in a consistent and accurate manner.

The central Iowa cash price used does not represent the bid of any single, particular country grain elevator. Instead it represents an unweighted average of the daily survey of country elevators as conducted by the Des Moines Register. Use of this figure removes the bias which may enter due to the market opinions of a particular warehouseman if a single elevator's records would have been used as a price source.

Most of the restraints introduced in the analysis of the hedging opportunities have been used to reduce the volume of data down to manageable size. In doing so the profitability of hedging operations has been reduced. Certainly a knowledgeable warehouseman would be able to increase the gross storage income as compared to income resulting from purely mechanical rules. Conversely, a warehouseman who does not possess the understanding for estimating changes in the basis would gain by following some such similar mechanical hedging strategy.

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APPENDIX A

Table 16. Weekly average central Iowa December corn basis in dollars per bushel

Week	63-64	64-65	65-66	66-67	67-68
1	0.17781	0.16425	0.11812	0.13075	0.13850
2	0.12325	0.15525	0.11800	0.12700	0.13925
3	0.18725	0.16974	0.11450	0.12325	0.13850
4	0.17950	0.18075	0.11725	0.14575	0.15050
5	0.18075	0.18938	0.12725	0.17075	0.14650
6	0.18750	0.17300	0.13200	0.19094	0.13750
7	0.17725	0.16725	0.13400	0.18625	0.16050
8	0.17000	0.16094	0.12937	0.19750	0.17500
9	0.16583	0.13850	0.14575	0.19525	0.17700
10	0.16475	0.11575	0.15100	0.18000	0.18250
11	0.14950	0.09750	0.11750	0.15475	0.16575
12	-[a]	-	-	-	-
13	-	-	-	-	-
14	0.12188	0.05100	0.08525	0.07688	0.26125
15	0.13450	0.05950	0.08800	0.07250	0.25025
16	0.13900	0.05850	0.08275	0.08925	0.23700
17	0.13200	0.06325	0.07500	0.09156	0.22975
18	0.12700	0.05975	0.06150	0.09250	0.24275
19	0.13475	0.06525	0.05950	0.09950	0.25000
20	0.13375	0.06650	0.06150	0.11550	0.25250
21	0.13750	0.06656	0.07375	0.11500	0.25312
22	0.14525	0.06625	0.09750	0.12500	0.25800
23	0.15400	0.05575	0.09950	0.15940	0.25200
24	0.14775	0.05275	0.07775	0.14600	0.24400
25	0.14650	0.04100	0.08325	0.15656	0.24675
26	0.11469	0.03725	0.08150	0.17350	0.22875
27	0.10875	0.04425	0.08219	0.19725	0.21575
28	0.09625	0.03281	0.07575	0.19025	0.19167

[a]Contract is not traded all or part of the week.

Table 16 (Continued)

Week	63-64	64-65	65-66	66-67	67-68
29	0.09450	0.02800	0.06925	0.19656	0.17225
30	0.06825	0.02950	0.06200	0.18550	0.15000
31	0.06550	0.02200	0.06175	0.16600	0.13150
32	0.07950	0.00850	0.06675	0.14450	0.14400
33	0.07175	0.00525	0.07000	0.12175	0.12750
34	0.06875	0.01325	0.08300	0.12150	0.11400
35	0.07375	0.01344	0.11250	0.12125	0.13969
36	0.08250	0.01825	0.11825	0.13375	0.13925
37	0.08400	0.03425	0.11900	0.11075	0.14350
38	0.08600	0.03525	0.15350	0.10400	0.14175
39	0.08450	0.04725	0.18675	0.10575	0.13675
40	0.08812	0.04750	0.17812	0.09344	0.11750
41	0.10325	0.07425	0.19750	0.10525	0.10850
42	0.11300	0.07725	0.21625	0.08500	0.10150
43	0.10900	0.07225	0.22425	0.08875	0.07975
44	0.09875	0.06125	0.20525	0.10475	0.08535
45	0.11475	0.08200	0.19700	0.11025	0.10350
46	0.11975	0.08625	0.20925	0.13350	0.09475
47	0.12550	0.07250	0.20025	0.12650	0.09725
48	0.12725	0.06025	0.17750	0.11225	0.09400
49	0.13300	0.06063	0.18469	0.09937	0.08344
50	0.14375	0.07050	0.17475	0.11781	0.07125
51	0.14525	0.06225	0.14375	0.13475	0.07325
52	0.14950	0.06281	0.13975	0.13925	0.09875

Table 17. Weekly average central Iowa March corn basis in dollars per bushel

Week	63-64	64-65	65-66	66-67	67-68
1	0.21312	0.20425	0.15896	0.18075	0.18975
2	0.16225	0.19500	0.16025	0.17675	0.19150
3	0.22450	0.20950	0.15600	0.17125	0.19150
4	0.21825	0.22175	0.16075	0.19750	0.20275
5	0.22125	0.22781	0.17050	0.22675	0.19625
6	0.22900	0.21375	0.17400	0.24688	0.18625
7	0.21675	0.21150	0.17375	0.24675	0.20425
8	0.21175	0.20375	0.17281	0.25844	0.21250
9	0.20833	0.18325	0.18175	0.25075	0.21425
10	0.20200	0.15625	0.18250	0.21700	0.22425
11	0.17775	0.13425	0.14050	0.19350	0.20575
12	0.16450	0.12844	0.12312	0.17750	0.19950
13	0.15750	0.13500	0.10625	0.16938	0.19312
14	0.14875	0.13100	0.13025	0.16000	0.19375
15	0.15050	0.12675	0.13800	0.16450	0.18550
16	0.15275	0.12650	0.14275	0.16175	0.16850
17	0.15200	0.13000	0.13750	0.15937	0.16525
18	0.14425	0.13725	0.13375	0.16275	0.16225
19	0.14225	0.14300	0.13350	0.15700	0.15875
20	0.12900	0.13400	0.12450	0.15650	0.15406
21	0.12719	0.12750	0.12656	0.14750	0.14937
22	0.13100	0.13575	0.13100	0.14800	0.15250
23	0.13200	0.14400	0.12700	0.15725	0.15625
24	0.12825	-[a]	-	0.15400	0.15600
25	-	-	-	-	-
26	-	0.10800	0.11400	-	-
27	0.12600	0.08150	0.11812	0.23950	0.25850
28	0.12950	0.07000	0.11325	0.23400	0.23625

[a]Contract is not traded part or all of the week.

Table 17 (Continued)

Week	63-64	64-65	65-66	66-67	67-68
29	0.12725	0.06775	0.10500	0.24031	0.21625
30	0.10075	0.06975	0.10000	0.22850	0.19525
31	0.09950	0.06025	0.09900	0.20825	0.17825
32	0.11500	0.04475	0.10400	0.18625	0.19075
33	0.10850	0.04025	0.10800	0.16350	0.17500
34	0.10575	0.04750	0.12125	0.16450	0.16175
35	0.10687	0.05063	0.14219	0.16563	0.18656
36	0.11875	0.05450	0.14829	0.17700	0.18500
37	0.12150	0.07325	0.15800	0.15525	0.18925
38	0.12250	0.07300	0.19600	0.14650	0.18775
39	0.12200	0.08700	0.22775	0.14950	0.18450
40	0.12625	0.08562	0.21969	0.13687	0.16500
41	0.14225	0.10975	0.24600	0.14875	0.15525
42	0.15200	0.11300	0.26425	0.12850	0.14850
43	0.14300	0.11000	0.27175	0.13325	0.12250
44	0.13550	0.09975	0.25250	0.14675	0.13175
45	0.15375	0.12025	0.25150	0.15425	0.15125
46	0.15750	0.12500	0.25850	0.18150	0.15500
47	0.16375	0.11275	0.25125	0.17500	0.14825
48	0.17075	0.10250	0.22750	0.16125	0.14575
49	0.17300	0.10156	0.24531	0.14719	0.13344
50	0.18188	0.11025	0.23050	0.16594	0.12025
51	0.18375	0.10475	0.19125	0.18650	0.12150
52	0.18775	0.10281	0.19050	0.18950	0.14700

Table 18. Weekly average central Iowa May corn basis in dollars per bushel

Week	63-64	64-65	65-66	66-67	67-68
1	0.22719	0.22425	0.18792	0.20800	0.22075
2	0.17725	0.21725	0.18825	0.20100	0.22325
3	0.24500	0.23325	0.18300	0.19575	0.22550
4	0.24525	0.24825	0.18900	0.22850	0.23575
5	0.24950	0.25375	0.19925	0.25800	0.22675
6	0.25950	0.23875	0.20250	0.27969	0.21800
7	0.24475	0.23550	0.20475	0.28000	0.23525
8	0.23800	0.22812	0.20156	0.29031	0.24562
9	0.23833	0.20700	0.20775	0.28000	0.25075
10	0.22975	0.17875	0.21075	0.24175	0.26150
11	0.20075	0.15775	0.16675	0.21875	0.24325
12	0.18900	0.15250	0.14906	0.20225	0.23975
13	0.18281	0.15719	0.13094	0.19656	0.23156
14	0.17000	0.15200	0.15625	0.18750	0.23219
15	0.17150	0.14975	0.16100	0.19175	0.22375
16	0.17450	0.14950	0.16025	0.18775	0.20800
17	0.17200	0.15450	0.16125	0.18594	0.20200
18	0.16350	0.16150	0.15300	0.19225	0.20200
19	0.16425	0.16800	0.15225	0.18850	0.20175
20	0.15250	0.15875	0.14025	0.18900	0.19469
21	0.15188	0.15563	0.14625	0.18156	0.19094
22	0.15650	0.16100	0.15950	0.18325	0.19550
23	0.15600	0.16600	0.15475	0.19850	0.19200
24	0.15015	0.16875	0.13800	0.18575	0.18975
25	0.14100	0.16375	0.13775	0.18219	0.18375
26	0.13156	0.15750	0.13200	0.17575	0.16825
27	0.12525	0.15775	0.13031	0.18325	0.15375
28	0.12550	0.15125	0.13375	0.17125	0.12333
29	0.12725	0.14650	0.13025	0.16406	0.11150

Table 18 (Continued)

Week	63-64	64-65	65-66	66-67	67-68
30	0.11550	0.14525	0.12450	0.13000	0.09075
31	0.12000	0.14850	0.11900	0.11650	0.07050
32	0.14150	0.14700	0.13100	0.10675	0.08825
33	0.13550	-[a]	-	-	0.07775
34	-	-	-	-	-
35	-	0.07563	0.16281	0.13094	-
36	0.14250	0.07850	0.17375	0.20650	0.21475
37	0.14650	0.09800	0.18275	0.18475	0.21900
38	0.14700	0.09825	0.21700	0.17450	0.21700
39	0.14575	0.11300	0.24650	0.17925	0.21300
40	0.15063	0.11063	0.23562	0.16594	0.19500
41	0.16525	0.13150	0.26800	0.17800	0.18500
42	0.17500	0.13775	0.28550	0.15750	0.17775
43	0.16475	0.13500	0.29575	0.16275	0.15275
44	0.15875	0.12250	0.27350	0.17525	0.16100
45	0.17700	0.14450	0.27450	0.18275	0.18150
46	0.18350	0.15025	0.28625	0.21125	0.17575
47	0.18650	0.13825	0.27875	0.20450	0.18225
48	0.19050	0.12800	0.25925	0.19200	0.17975
49	0.19225	0.12688	0.27938	0.17594	0.16812
50	0.19844	0.13775	0.26375	0.19531	0.15325
51	0.20175	0.13175	0.21750	0.21725	0.15350
52	0.20925	0.13125	0.21950	0.22025	0.14875

[a]Contract is not traded all or part of the week.

Table 19. Weekly average central Iowa July corn basis in dollars per bushel

Week	63-64	64-65	65-66	66-67	67-68
1	0.23344	0.23638	0.20667	0.22725	0.24550
2	0.19100	0.23075	0.20650	0.21925	0.24775
3	0.25950	0.24900	0.20050	0.20875	0.25050
4	0.26300	0.26625	0.20674	0.24300	0.26400
5	0.26925	0.26875	0.21650	0.27225	0.25020
6	0.28000	0.25425	0.21525	0.29500	0.24575
7	0.26750	0.25125	0.21600	0.30175	0.26225
8	0.25825	0.24219	0.21781	0.30938	0.27187
9	0.25833	0.22000	0.22050	0.29950	0.27900
10	0.24825	0.19074	0.22450	0.25750	0.29025
11	0.21800	0.16850	0.17575	0.23300	0.27125
12	0.20750	0.16094	0.16125	0.21800	0.26900
13	0.20094	0.16625	0.14469	0.21188	0.26125
14	0.18938	0.16125	0.16600	0.20219	0.26250
15	0.19000	0.16025	0.16700	0.20450	0.25350
16	0.19200	0.15975	0.16700	0.20000	0.23775
17	0.18925	0.16675	0.16950	0.20125	0.23200
18	0.18075	0.15575	0.16375	0.21100	0.23050
19	0.18300	0.18025	0.16275	0.20925	0.22975
20	0.17225	0.17250	0.15300	0.21175	0.22469
21	0.17125	0.17094	0.15906	0.20687	0.22281
22	0.17775	0.17425	0.17625	0.21225	0.23275
23	0.17750	0.17675	0.17050	0.22350	0.22900
24	0.17050	0.17775	0.15725	0.21625	0.22525
25	0.16200	0.17000	0.15550	0.21500	0.22075
26	0.14812	0.16050	0.14575	0.21450	0.20350
27	0.14100	0.16875	0.14594	0.22125	0.18925
28	0.13775	0.16063	0.14400	0.20750	0.16083
29	0.13725	0.15575	0.13450	0.19938	0.14600

Table 19 (Continued)

Week	63-64	64-65	65-66	66-67	67-68
30	0.12350	0.15625	0.12725	0.16900	0.12400
31	0.12675	0.15650	0.12225	0.15600	0.10300
32	0.14775	0.15000	0.13225	0.13875	0.11300
33	0.13500	0.15200	0.13000	0.11950	0.09900
34	0.13350	0.15100	0.12875	0.12625	0.08050
35	0.12937	0.15156	0.13156	0.12063	0.10156
36	0.13525	0.14325	0.13775	0.12400	0.09925
37	0.13700	0.14550	0.13425	0.11600	0.10050
38	0.14375	0.15225	0.14525	0.11300	0.10650
39	0.14675	0.15850	0.14875	0.10925	0.10675
40	0.15125	0.15062	0.14812	0.11219	0.10167
41	0.16500	0.16800	0.16350	0.12675	0.09625
42	0.16350	-[a]	-	-	-
43	-	-	-	-	-
44	-	0.13875	0.28575	0.19625	0.14650
45	0.19375	0.16025	0.28250	0.20425	0.20400
46	0.20150	0.16600	0.30150	0.23575	0.20325
47	0.20350	0.15225	0.29675	0.22800	0.21250
48	0.20450	0.14375	0.27975	0.21650	0.20975
49	0.20275	0.14344	0.30500	0.19844	0.19750
50	0.20875	0.15650	0.28525	0.21625	0.18025
51	0.21150	0.15100	0.23875	0.24050	0.18125
52	0.22225	0.15094	0.23975	0.24325	0.20925

[a]Contract is not traded all or part of the week.

Table 20. Weekly average central Iowa September corn basis in dollars per bushel

Week	63-64	64-65	65-66	66-67	67-68
1	0.20719	0.21063	0.17708	0.18800	0.24300
2	0.16150	0.20125	0.18325	0.17650	0.24325
3	0.23225	0.22175	0.17775	0.15450	0.25325
4	0.24350	0.24100	0.17825	0.18775	0.26725
5	0.25025	0.24625	0.19000	0.21125	0.25250
6	0.26025	0.23475	0.18650	0.23125	0.25500
7	0.25050	0.22325	0.18100	0.25025	0.27375
8	0.24500	0.21562	0.17969	0.26188	0.27937
9	0.24542	0.19425	0.17950	0.24575	0.28600
10	0.23500	0.16325	0.18600	0.19674	0.30200
11	0.20275	0.13600	0.13825	0.17400	0.27950
12	0.19500	0.12344	0.12250	0.15900	0.28300
13	0.18750	0.12344	0.10656	0.15406	0.27500
14	0.17656	0.12125	0.12650	0.14875	0.27312
15	0.17550	0.12300	0.12700	0.14925	0.26775
16	0.17675	0.12325	0.13150	0.15325	0.25125
17	0.17225	0.13325	0.13275	0.15687	0.24275
18	0.16375	0.14225	0.12375	0.16375	0.24675
19	0.16950	0.14625	0.12475	0.16900	0.24850
20	0.16350	0.14250	0.11675	0.18575	0.24375
21	0.16500	0.14625	0.12437	0.18937	0.24187
22	0.17275	0.14400	0.14000	0.19875	0.25425
23	0.17700	0.13500	0.14075	0.21825	0.24950
24	0.17025	0.13650	0.12825	0.21575	0.24375
25	0.16800	0.12750	0.13075	0.21750	0.24175
26	0.14187	0.11725	0.12600	0.22125	0.22450
27	0.13275	0.12400	0.12469	0.23250	0.20950
28	0.12875	0.111888	0.11650	0.22300	0.18250
29	0.12950	0.10650	0.10725	0.21719	0.16475

Table 20 (Continued)

Week	63-64	64-65	65-66	66-67	67-68
30	0.10850	0.10775	0.10175	0.18875	0.14375
31	0.11000	0.10650	0.09375	0.17475	0.12325
32	0.12625	0.09475	0.09725	0.15225	0.13175
33	0.10600	0.08650	0.10025	0.13050	0.11775
34	0.10250	0.08775	0.10925	0.13600	0.10175
35	0.10656	0.09281	0.12406	0.13281	0.12469
36	0.11150	0.09475	0.13350	0.13925	0.12250
37	0.10950	0.10875	0.13125	0.12700	0.12475
38	0.11325	0.10750	0.15025	0.11875	0.12975
39	0.11825	0.11400	0.17300	0.11650	0.13050
40	0.11938	0.10906	0.17125	0.11187	0.11417
41	0.13425	0.13775	0.17925	0.11700	0.10350
42	0.14275	0.13750	0.19350	0.10300	0.09600
43	0.13675	0.12575	0.19800	0.11575	0.08850
44	0.13325	0.10725	0.19050	0.12475	0.08775
45	0.14175	0.11525	0.19025	0.12600	0.10450
46	0.13675	0.12125	0.19700	0.15000	0.10900
47	0.14250	0.11525	0.18025	0.14825	0.11075
48	0.14900	0.11425	0.16000	0.13975	0.10650
49	0.15475	0.11438	0.15406	0.12750	0.09687
50	0.16469	0.12650	0.14525	0.14469	0.09075
51	-[a]	-	-	-	-
52	-	-	-	-	-

[a]Contract is not traded all or part of the week.

Table 21. Daily average revenue in cents per bushel for corn storage by weeks of the crop year October 1, 1963 to October 1, 1964

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
1	1.434	-1.535	1.184	-1.160	6.809	3.840	10.277	6.340	10.621	10.715
2	-6.110	-9.560	-4.410	-9.060	2.065	-2.160	6.140	1.940	5.715	4.140
3	0.665	2.140	2.290	1.040	8.140	8.340	14.090	13.540	13.440	13.440
4	1.190	2.140	3.890	4.140	6.990	6.740	13.840	13.540	13.540	11.640
5	0.240	-0.160	5.115	6.240	7.415	7.240	13.140	12.840	14.015	11.890
6	2.315	-0.560	8.515	6.240	8.565	5.640	14.090	12.140	14.565	9.640
7	3.665	3.440	7.340	6.440	7.690	5.340	12.365	13.040	12.940	9.340
8	4.040	5.840	7.015	6.340	7.790	4.740	11.790	12.640	12.040	10.090
9	4.715	6.507	6.757	7.340	7.673	5.840	13.507	12.340	11.465	9.507
10	6.415	6.640	5.465	5.940	7.315	5.540	12.090	11.140	9.865	6.740
11	3.215	1.940	3.015	2.740	5.890	3.940	8.990	7.440	6.690	1.740
12	2.390	2.340	1.840	1.640	4.815	4.240	7.615	6.090	6.765	0.840
13	1.059	1.340	1.752	0.715	4.778	3.340	6.121	3.715	7.090	0.715
14	0.028	1.090	1.059	-0.410	4.746	3.965	5.309	4.590	5.475	1.778
15	0.340	0.640	1.740	-1.060	5.840	4.740	5.090	4.140	5.240	1.440
16	0.715	-0.160	2.215	-0.260	7.090	6.440	4.540	2.190	4.840	1.340
17	1.340	-0.960	2.840	1.040	6.290	6.840	3.690	-0.360	4.175	3.390
18	1.115	-1.760	2.840	2.040	4.505	5.740	2.940	-1.060	3.015	3.790
19	1.165	-0.060	2.865	2.740	4.490	6.640	4.915	0.040	3.040	5.140
20	.540	1.440	2.865	3.440	3.215	7.640	4.290	1.190	1.190	5.690
21	1.121	3.090	3.745	5.090	5.278	6.965	4.309	1.965	1.215	5.090
22	1.665	2.940	5.240	6.440	5.265	6.340	4.540	1.540	0.690	1.990
23	2.965	2.640	4.915	6.740	4.990	4.840	4.590	2.440	0.340	1.140
24	3.430	2.940	3.205	4.940	4.140	3.990	3.790	3.390	0.390	0.440
25	3.690	4.140	2.240	4.340	2.765	1.840	2.915	2.490	-1.885	-3.260
26	2.559	4.715	1.027	4.965	0.935	1.215	-0.129	3.527	-6.129	-4.785
27	0.890	3.140	0.565	3.340	0.415	0.490	-1.635	1.340	-8.260	-8.760

Table 21 (Continued)

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
28	0.690	1.215	1.490	2.040	-0.585	-0.760	-3.835	-1.710	-7.460	-6.660
29	0.640	0.540	0.965	0.440	-1.310	-4.360	-5.610	-3.760	-6.910	-6.760
30	-0.410	0.490	-0.535	-1.160	-2.210	-6.960	-7.660	-4.660	-8.710	-5.060
31	0.390	-0.760	-0.535	-2.010	-1.535	-6.860	-9.210	-6.860	-5.835	-2.560
32	2.015	-1.260	0.840	-1.860	0.940	-4.810	-9.685	-7.560	-2.265	3.540
33	0.615	-0.760	-0.185	-1.110	-1.660	-3.560	-11.960	-10.360	-0.960	3.940
34	0.140	0.390	-1.010	-1.960	-2.410	-4.160	-10.210	-7.860	-1.885	2.940
35	-1.066	0.715	-2.098	-4.035	-2.504	-3.035	-8.973	-7.035	-2.472	2.215
36	-0.135	0.440	-1.598	-5.160	-1.960	-0.110	-7.485	-3.960	-1.885	1.740
37	-0.485	-1.560	-1.785	-4.460	-2.735	0.390	-4.935	-0.560	-0.585	4.040
38	-0.585	-3.510	-0.360	-2.760	-2.660	2.790	-0.210	5.140	-1.160	4.540
39	-0.435	-2.360	-0.410	-1.460	-3.985	2.040	0.540	6.040	-1.560	4.840
40	-0.941	-0.910	-0.535	-1.597	-4.223	0.340	0.184	5.965	-1.848	5.215
41	1.665	0.340	0.440	1.850	-4.085	1.790	1.440	7.640	-0.210	8.840
42	2.065	-2.860	1.190	5.790	-3.710	3.240	1.390	8.140	0.640	9.140
43	1.315	-5.110	0.190	5.740	-3.485	2.540	1.515	9.340	-1.685	8.740
44	0.340	-4.010	-0.635	7.090	-7.660	-0.360	0.240	9.040	-1.685	8.740
45	1.090	1.140	-1.185	5.790	-7.060	-4.060	1.750	8.240	1.165	10.090
46	0.190	1.240	-1.035	3.340	-6.135	-3.360	1.340	7.940	2.715	11.640
47	0.290	02.360	-1.860	0.790	-3.910	-3.160	1.940	7.840	4.115	11.740
48	-0.460	-3.660	-2.285	-1.260	-3.360	-2.760	2.515	4.740	4.740	10.140
49	0.290	04.535	-1.085	-.460	-0.660	0.540	1.440	3.040	4.140	9.190
50	0.152	-5.060	-3.191	-4.910	4.277	2.965	2.934	3.965	4.434	8.590
51	-0.460	-7.060	-3.635	-6.960	6.790	6.140	3.865	5.890	5.565	9.840
52	0.515	-4.410	-3.585	-5.460	6.440	7.540	5.640	10.040	6.490	12.290

Table 22. Daily average revenue in cents per bushel for corn storage by week of the crop year October 1, 1964 to October 1, 1965

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
1	1.715	-2.560	-0.047	-1.410	7.265	7.340	7.940	12.790	7.840	13.548
2	-1.535	-4.060	1.065	2.840	6.490	7.640	6.890	11.990	8.814	13.840
3	-1.185	-1.060	6.365	6.840	7.840	8.940	7.890	13.040	10.690	13.590
4	-0.460	3.440	10.340	13.340	8.565	11.640	10.215	17.040	12.140	16.140
5	2.215	6.715	10.496	13.215	8.590	12.090	10.965	18.027	12.684	16.340
6	0.865	7.640	8.790	11.140	6.840	11.440	9.265	16.340	10.965	14.890
7	1.790	10.240	7.615	7.940	6.940	9.340	9.090	14.440	10.140	13.140
8	4.027	7.965	6.934	5.715	4.934	5.465	8.121	12.902	9.965	11.340
9	5.640	5.940	5.515	5.640	2.665	3.440	7.765	10.240	7.415	7.740
10	2.340	1.740	2.165	1.940	0.565	2.590	4.690	6.840	4.565	2.990
11	-0.160	-0.860	-0.435	0.340	-0.060	3.140	2.740	4.740	2.390	0.740
12	0.153	0.215	-1.754	0.215	-0.129	3.965	1.559	3.778	0.996	0.590
13	0.121	0.590	-0.910	1.840	1.277	5.715	1.934	5.090	0.715	-0.285
14	-0.535	0.540	-1.460	0.340	0.890	5.840	1.565	5.240	-0.635	-3.560
15	-1.735	-0.160	-3.185	-2.460	-0.110	3.690	1.540	3.340	-0.885	-6.010
16	-1.785	0.440	-2.585	-0.960	-0.360	3.640	1.490	0.190	-0.565	-5.560
17	-1.560	-0.960	-1.210	1.090	0.965	4.740	1.340	-0.160	0.640	-3.810
18	-2.135	-3.260	0.690	2.740	1.640	4.590	2.990	-0.160	1.040	-3.660
19	-0.935	-1.460	2.265	3.840	2.265	4.640	3.040	-1.760	-0.460	-6.660
20	-0.810	0.990	1.565	4.440	1.240	5.140	1.490	-4.960	-2.485	-5.760
21	-0.254	2.965	0.590	3.153	2.809	5.215	1.402	-6.597	-1.910	-6.035
22	0.915	3.340	0.665	2.840	3.215	3.390	1.440	-6.460	-3.335	-8.860
23	2.265	3.740	1.990	3.540	3.190	2.640	0.865	-5.110	-5.135	-10.760
24	2.040	2.190	2.440	3.890	3.440	2.190	0.540	-4.160	-3.735	-9.860
25	0.940	1.040	1.665	2.540	2.515	1.240	-1.535	-8.560	-7.485	-13.460
26	1.140	1.340	1.290	2.040	1.240	0.640	-5.860	-9.060	-10.460	-16.860

Table 22 (Continued)

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
27	1.340	2.590	1.621	2.740	2.565	0.840	-3.935	-8.160	-9.760	-15.760
28	0.496	1.215	0.665	0.153	1.496	-3.097	-6.566	-11.785	-10.191	-14.910
29	0.190	0.540	-0.735	-0.760	0.890	-4.260	-7.810	-14.060	-8.885	-14.660
30	1.115	0.490	-0.910	-1.460	-0.435	-5.210	-6.510	-14.060	-9.960	-14.860
31	1.390	-0.760	-1.360	-1.310	-0.860	-5.210	-8.660	-15.060	-11.310	-11.160
32	0.565	-1.260	-1.060	-1.260	-2.560	-8.260	-12.960	-18.360	-11.785	-8.660
33	1.015	-0.760	-0.385	-0.660	-4.685	-10.810	-13.660	-17.760	-9.910	-7.160
34	0.640	0.390	-1.310	-2.010	-4.285	-9.060	-12.285	-14.560	-7.635	-4.710
35	0.121	0.715	-2.097	-2.785	-3.379	-7.972	-10.410	-13.160	-6.441	-1.535
36	-0.035	0.440	-1.735	-3.660	-3.310	-6.460	-10.710	-13.760	-5.560	0.040
37	-0.035	-1.560	-0.560	-3.360	-2.785	-8.060	-10.010	-9.960	-5.385	-0.360
38	0.715	-3.510	-1.035	-6.060	-5.060	-9.760	-9.310	-7.960	-6.385	-1.560
39	0.440	-2.360	-1.835	-8.310	-3.335	-6.960	-5.485	-5.060	-4.760	-1.010
40	-0.441	-0.910	-2.160	-7.285	-5.129	-8.660	-4.379	-3.098	-4.566	0.902
41	2.115	0.340	0.940	-3.210	-2.835	-6.660	-0.660	2.540	-3.560	2.190
42	0.690	-2.860	1.050	-0.560	-2.735	-7.060	0.315	5.640	-3.735	-0.260
43	-0.535	-5.110	-1.010	-2.085	-7.560	-7.560	4.840	-3.935	-4.810	-4.810
44	-2.110	-4.010	-4.585	-4.760	-6.660	-11.160	-3.735	3.540	-4.435	-4.210
45	-1.185	1.140	-0.385	-0.860	-6.185	-9.360	-1.585	5.490	-1.585	-0.760
46	-1.460	1.240	-0.635	-1.560	-5.535	-7.160	-0.610	7.190	0.765	2.640
47	-3.785	-2.360	-3.010	-5.060	-4.910	-6.360	-3.260	3.790	1.265	2.590
48	-1.310	-3.660	-4.435	-8.160	-6.185	-8.960	-4.785	-1.360	0.690	0.740
49	-3.129	-4.535	-2.973	-6.410	-7.379	-5.285	-4.816	-3.472	-0.219	2.090
50	-2.960	-5.060	-5.010	-8.260	-6.110	-2.160	-3.610	-2.460	0.915	4.240
51	-4.585	-7.060	-8.135	-10.860	-6.185	-0.060	-3.185	-2.560	0.790	3.990
52	-2.285	-4.410	-7.910	-9.285	-3.316	1.215	-2.410	0.152	0.184	2.653

Table 23. Daily average revenue in cents per bushel for corn storage by week of the crop year October 1, 1965 to October 1, 1966

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
1	-0.056	-1.077	-1.139	-0.493	3.923	9.632	5.694	8.965	5.611	9.882
2	-2.560	-2.660	-0.035	0.740	4.865	13.540	6.840	10.140	7.615	11.440
3	-2.685	-1.960	-1.935	2.840	3.815	14.940	5.510	10.740	6.315	10.040
4	-1.035	0.940	-1.435	5.840	2.565	13.840	6.040	12.240	6.490	10.390
5	0.890	1.740	0.315	9.140	3.265	13.190	7.540	13.190	8.015	11.340
6	-0.185	3.440	3.890	8.990	4.315	13.290	7.190	10.390	7.940	11.340
7	0.240	5.740	5.640	11.040	3.190	12.090	7.365	11.090	7.315	15.640
8	0.371	8.465	6.215	13.965	2.153	9.090	6.934	12.027	8.559	18.278
9	4.490	6.690	6.615	13.190	3.215	4.390	8.540	8.690	8.065	15.590
10	6.165	6.590	4.965	10.040	3.440	1.690	8.140	6.240	6.740	16.040
11	2.915	4.440	0.265	3.790	0.290	-3.160	3.940	1.540	-3.780	13.540
12	0.934	5.340	-0.941	2.590	-0.848	-3.035	2.496	0.590	-5.441	11.215
13	-2.347	2.590	-2.535	1.965	-0.660	-1.722	0.590	2.215	-7.066	10.465
14	-0.660	1.840	-1.885	-0.960	3.315	-1.310	2.590	5.040	-4.985	11.490
15	0.340	-0.010	-1.235	-4.860	3.790	-2.060	3.090	5.790	-4.685	15.540
16	1.140	0.640	-0.735	-7.510	3.165	-1.160	1.815	6.040	-3.360	17.540
17	-1.160	-2.660	-0.360	-7.310	3.540	-0.710	1.015	8.740	-1.010	14.840
18	-1.660	-4.860	-0.110	-6.160	2.740	-0.660	2.090	8.840	-2.010	15.340
19	-1.660	-7.910	1.290	-3.760	1.965	-3.060	1.890	8.540	-1.810	10.940
20	-1.660	-6.610	1.740	-2.310	0.940	-1.110	1.865	10.490	-8.110	10.740
21	-0.879	-3.660	2.434	0.590	2.902	1.715	2.465	17.590	-5.066	13.215
22	1.690	-1.640	3.115	4.240	3.540	2.990	1.865	23.240	-1.435	15.290
23	2.915	2.790	2.740	4.990	3.140	3.340	0.890	21.340	-0.835	14.640
24	1.690	2.540	1.390	4.440	2.140	2.690	-0.385	20.040	-2.960	13.240
25	0.940	1.840	0.565	0.390	1.740	2.540	-0.485	14.840	-3.785	11.240
26	0.465	2.990	0.090	1.990	0.515	6.940	-2.485	14.540	-7.735	9.340

Table 23 (Continued)

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
27	0.621	2.840	-0.535	2.090	1.184	8.277	-4.973	13.215	-9.285	9.715
28	0.315	-0.510	0.665	-0.260	-0.285	6.840	-3.510	11.990	-12.435	6.440
29	-0.085	-1.010	-0.735	-1.810	-1.910	9.040	-4.010	10.040	-13.335	3.440
30	-1.035	-0.660	-0.910	-1.760	-7.635	10.240	-4.610	8.640	-10.885	8.040
31	-1.510	-0.660	-1.360	0.040	-8.385	9.540	-5.235	9.740	-7.135	17.040
32	-0.960	-1.110	-1.060	4.240	-7.885	11.490	-8.810	7.340	-5.910	15.640
33	-0.635	-0.960	-0.385	6.490	-7.535	13.640	-10.160	8.040	-6.110	12.690
34	-0.710	-0.060	-1.310	6.340	-6.110	19.240	-11.710	5.940	-5.085	11.290
35	-1.160	3.965	-2.097	8.965	-2.870	17.965	-9.754	3.090	-2.441	11.090
36	0.365	7.290	-4.260	12.140	-0.910	17.240	-5.810	8.540	-0.385	14.440
37	-0.560	6.340	-4.635	9.940	-1.635	14.340	-1.885	16.140	0.315	10.090
38	-1.185	4.440	-2.585	7.140	1.015	9.340	2.815	12.540	4.165	7.840
39	-0.310	6.040	-0.335	7.590	5.015	6.140	6.165	8.490	7.340	5.540
40	-0.566	4.465	-0.335	12.965	6.215	6.402	4.559	5.527	6.465	2.465
41	0.240	2.990	1.765	10.940	8.815	2.940	7.665	3.040	9.640	-1.010
42	1.690	2.740	5.140	6.740	10.665	0.140	10.965	3.990	11.565	0.190
43	2.565	9.740	4.840	7.940	12.040	2.740	11.690	2.590	10.790	1.590
44	2.890	9.040	5.565	3.240	6.490	-1.960	9.940	1.790	8.365	-1.660
45	4.815	4.840	5.665	-0.160	3.065	-3.260	9.715	-0.160	8.265	-3.360
46	4.740	-0.340	9.140	-4.210	2.015	-9.160	10.290	-7.860	8.965	-8.210
47	4.540	-2.760	9.090	-4.960	-1.560	-12.860	10.165	-8.910	8.165	-8.060
48	3.715	-3.360	6.790	-4.960	-0.110	-7.560	7.890	-4.910	7.690	-4.710
49	6.621	-3.285	8.278	-4.535	3.621	-1.035	8.371	-5.472	11.059	-9.535
50	6.440	-0.910	4.415	-3.160	4.815	5.540	6.115	-3.810	11.140	-7.810
51	3.515	-0.860	-2.310	-3.560	1.515	3.590	2.315	-2.510	9.965	-6.960
52	3.515	0.540	-4.285	-2.460	-2.360	1.740	2.265	-1.960	10.165	-3.760

Table 24. Daily average revenue in cents per bushel for corn storage by week of the crop year October 1, 1966 to October 1, 1967

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
1	0.015	0.140	-7.610	-4.260	3.923	2.490	1.065	-1.210	10.040	-1.360
2	-3.985	-0.560	-6.435	-2.460	4.865	5.140	1.565	2.190	10.665	0.540
3	-5.935	-1.360	-2.985	4.340	3.815	2.340	2.475	-2.660	9.190	0.840
4	-6.110	-2.860	1.915	10.240	2.565	3.790	7.615	-3.110	11.190	1.340
5	-2.060	-2.260	4.215	6.790	3.265	3.940	14.015	-3.760	15.765	-0.260
6	3.496	5.590	8.152	5.152	4.315	2.715	16.121	-0.410	20.121	1.652
7	5.765	11.140	8.165	4.840	3.190	0.440	16.990	0.640	20.115	1.640
8	7.090	10.215	9.934	7.090	2.153	3.715	20.402	2.715	20.402	1.090
9	8.165	5.290	10.065	5.040	3.215	2.440	18.465	2.040	18.390	-2.860
10	4.490	-1.110	6.190	-2.010	3.440	-3.660	13.115	-3.460	13.290	-11.060
11	2.965	-0.560	3.765	-0.460	0.290	-3.760	10.990	-4.460	6.115	-12.410
12	2.390	1.240	1.590	-0.860	0.240	-3.810	11.715	-3.610	3.440	-13.710
13	1.590	-1.222	1.028	-4.285	-0.066	-4.097	11.840	-2.910	2.434	-16.597
14	0.653	-0.160	0.590	-4.972	-0.848	-3.785	9.590	-5.160	0.903	-19.785
15	1.015	-1.060	0.890	-2.610	0.940	-2.410	9.765	-6.360	1.215	-20.010
16	0.615	-1.060	-1.035	0.090	1.940	-4.160	7.665	-7.860	2.640	-15.560
17	0.965	-4.597	-2.660	-3.223	3.715	-6.972	6.340	-9.597	3.496	-16.972
18	1.475	-1.060	-0.760	-2.010	7.440	-6.460	4.515	-11.310	4.215	-16.560
19	-0.260	1.440	-0.835	-0.360	7.065	-2.160	4.065	-12.310	1.840	-18.610
20	-1.285	1.990	-0.835	1.290	8.140	1.140	5.090	-12.710	-0.335	-17.160
21	-1.910	-0.973	-0.223	0.277	9.527	-1.785	5.059	-18.223	0.527	-20.723
22	-1.560	-3.360	0.740	-3.360	9.565	-1.160	6.765	-17.110	1.240	-22.110
23	0.165	-1.810	3.890	-4.910	9.365	-0.360	9.490	-15.410	4.115	-20.110
24	-0.060	-0.110	6.565	-6.360	9.890	-2.210	9.465	-15.660	2.540	-21.810
25	0.559	-1.160	6.215	-3.535	11.496	-1.410	7.371	-18.097	-0.566	-25.348
26	1.415	-4.810	6.440	-2.760	11.840	-1.160	4.615	-20.760	4.665	-22.360

Table 24 (Continued)

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
27	5.465	-6.860	9.265	-2.560	11.515	-3.960	8.615	-20.960	2.965	-28.110
28	5.115	-2.460	9.265	1.740	9.190	-3.160	7.890	-19.410	-1.335	-29.910
29	5.184	2.340	7.715	4.715	7.778	-2.910	8.715	-14.847	1.184	-23.785
30	3.265	4.440	4.040	5.240	7.990	-2.510	7.240	-13.960	2.640	-18.910
31	4.215	3.540	5.090	1.890	5.190	-7.310	1.540	-21.260	3.815	-18.260
32	1.690	1.750	4.515	1.140	2.140	-12.410	0.865	-20.910	1.940	-17.310
33	-0.910	0.740	1.315	-1.110	-0.935	-15.760	-2.960	-23.560	-2.885	-21.110
34	2.115	-0.810	1.640	-2.910	0.090	-15.610	-8.210	-30.510	-2.160	-22.310
35	2.809	-0.535	-0.316	-7.910	0.684	-15.035	-6.660	-29.285	-0.598	-21.785
36	1.940	-1.760	3.215	-7.510	1.740	-14.610	-3.085	-25.260	1.290	-20.260
37	0.915	-0.660	0.615	-7.910	0.240	-13.210	-2.410	-19.860	-0.535	-17.110
38	-1.035	-4.860	-1.110	-11.110	-2.132	-17.360	-1.610	-16.110	-1.735	-17.260
39	0.940	-4.910	-2.110	-13.560	-1.035	-17.310	-4.210	-19.560	-1.085	-17.110
40	-0.910	-6.723	-2.566	-13.598	-1.691	-16.910	-5.098	-19.348	-0.566	-14.785
41	-1.135	-5.310	-1.185	-7.360	-0.610	-12.160	-2.835	-14.510	0.240	-10.660
42	-3.185	-8.310	-1.960	-7.610	-2.410	-12.360	-3.535	-13.360	-2.135	-12.360
43	-2.260	-7.360	-0.585	-5.360	-4.185	-12.610	-2.910	-9.760	-0.703	-9.328
44	-0.410	-1.960	-2.585	-6.210	-4.810	-11.210	-1.535	-6.660	5.625	-0.450
45	0.340	0.290	-0.860	-4.860	-1.335	-6.160	-0.860	-4.860	5.900	1.850
46	2.840	2.840	2.290	-2.310	-6.535	-12.560	3.665	-0.460	8.825	4.750
47	-0.235	-2.110	1.515	-2.660	-6.910	-13.010	2.865	-1.160	10.000	4.750
48	-0.660	-3.460	0.315	-3.060	-5.935	-9.960	1.140	-3.060	10.325	3.300
49	-1.035	-4.098	-2.348	-5.598	-4.504	-7.473	-0.535	-4.660	10.969	1.875
50	0.559	-2.035	-4.441	-6.723	-0.160	-1.535	7.531	4.937	13.937	6.125
51	2.540	1.390	0.790	-0.560	0.390	1.590	9.325	7.950	16.575	8.000
52	2.340	2.740	-2.835	-4.110	-0.310	0.190	9.250	9.250	19.925	10.050

Table 25. Daily average revenue in cents per bushel for corn storage by week of the crop year October 1, 1967 to October 1, 1968

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
1	-1.785	-1.910	-6.510	-8.110	0.665	0.140	10.975	10.200	17.475	11.150
2	1.240	1.140	-4.310	-5.060	2.390	1.690	12.925	10.350	17.175	9.700
3	-2.910	-4.310	-1.460	-1.710	2.740	2.590	14.900	8.550	17.475	8.250
4	-5.310	-6.810	2.790	3.590	4.415	4.690	17.975	11.650	18.175	8.700
5	-3.585	-4.460	1.565	3.890	3.165	3.490	17.525	10.300	16.425	7.100
6	-1.560	-0.010	-0.635	1.690	3.415	5.290	17.700	11.550	15.425	7.050
7	3.790	6.090	2.115	3.940	6.165	8.590	18.925	14.950	16.750	6.500
8	4.777	7.965	4.340	5.652	6.184	8.027	19.500	14.062	19.031	7.500
9	2.190	4.290	4.965	6.490	6.290	6.540	20.600	12.550	19.875	7.150
10	3.815	3.790	6.515	7.090	10.961	10.486	20.800	11.300	21.500	6.900
11	3.515	1.490	4.140	3.340	11.350	9.550	18.625	6.800	19.775	2.450
12	3.490	3.090	4.315	3.790	10.525	9.850	17.875	6.400	20.625	0.750
13	2.840	4.278	5.059	5.465	11.437	10.687	12.844	4.125	18.531	-2.625
14	3.262	4.278	4.684	5.590	12.875	11.687	17.375	4.250	18.406	-2.813
15	2.265	2.540	3.565	2.940	13.500	9.300	17.425	3.150	18.525	-2.700
16	2.365	1.840	2.822	1.172	14.325	6.550	16.125	0.650	16.975	-5.100
17	1.890	1.540	7.475	6.350	14.650	7.550	15.550	-0.350	17.100	-5.100
18	1.240	0.440	6.700	6.750	15.700	6.600	16.950	-1.100	17.950	-5.050
19	1.847	0.722	7.875	6.600	15.850	7.600	16.300	-5.550	16.775	-5.600
20	6.281	5.625	8.844	6.687	14.812	7.437	15.250	-7.688	19.594	-6.500
21	5.625	6.375	9.905	6.875	13.844	6.000	15.812	-6.437	19.906	-6.000
22	6.775	6.750	11.900	6.250	15.700	5.950	17.050	-4.650	-[a]	-
23	8.100	7.400	13.600	7.550	14.675	4.600	17.575	-5.100	-	-
24	9.575	6.950	13.825	6.300	13.925	3.100	17.550	-5.700	-	-
25	10.725	5.050	14.275	6.350	12.925	1.850	16.700	-5.950	-	-
26	11.225	6.150	12.225	6.950	10.875	-1.500	17.100	-7.150	-	-

[a]Sale date after October 1, 1968.

Table 25 (Continued)

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
27	10.225	6.000	10.225	6.000	10.850	-0.400	16.025	-6.750	-	-
28	8.375	5.333	8.792	4.417	8.000	-1.000	-	-	-	-
29	6.725	6.450	6.475	3.300	7.000	-1.200	-	-	-	-
30	4.125	4.250	3.925	0.450	6.125	-3.900	-	-	-	-
31	3.125	2.050	1.450	-0.600	4.675	-5.800	-	-	-	-
32	3.175	1.100	1.750	-3.000	4.350	-9.750	-	-	-	-
33	1.425	-0.650	1.075	-4.650	2.975	-11.100	-	-	-	-
34	-0.800	-1.700	0.300	-4.450	1.775	-10.300	-	-	-	-
35	0.562	-1.875	2.531	-2.500	4.563	-8.187	-	-	-	-
36	0.950	-2.600	2.275	-2.650	5.075	-7.400	-	-	-	-
37	2.125	-1.550	4.750	-3.300	5.750	-7.250	-	-	-	-
38	3.000	0.650	4.425	-5.100	4.900	-5.150	-	-	-	-
39	3.025	1.750	4.100	-4.850	8.225	-3.350	-	-	-	-
40	3.417	0.833	3.000	-3.917	5.125	-4.250	-	-	-	-
41	2.575	-1.750	1.975	-3.450	-	-	-	-	-	-
42	0.425	-5.550	2.225	-3.900	-	-	-	-	-	-
43	0.325	-4.250	2.025	-3.350	-	-	-	-	-	-
44	0.400	-0.050	1.750	-0.150	-	-	-	-	-	-
45	3.075	3.050	4.475	2.300	-	-	-	-	-	-
46	4.075	3.200	4.200	3.100	-	-	-	-	-	-
47	4.050	2.750	-	-	-	-	-	-	-	-
48	4.650	2.550	-	-	-	-	-	-	-	-
49	3.525	3.312	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-
51	-	-	-	-	-	-	-	-	-	-
52	-	-	-	-	-	-	-	-	-	-

Table 26. Weekly average December-July corn spread in dollars per bushel

Week	63-64	64-65	65-66	66-67	67-68
1	0.05563	0.07213	0.08854	0.09650	0.10700
2	0.06775	0.07550	0.08850	0.09225	0.10850
3	0.07225	0.07925	0.08600	0.08550	0.11200
4	0.08350	0.08550	0.08950	0.09725	0.11350
5	0.08850	0.07937	0.08925	0.10150	0.10375
6	0.09250	0.08125	0.08325	0.10406	0.10825
7	0.09025	0.08400	0.08200	0.11550	0.10175
8	0.08825	0.08125	0.08844	0.11187	0.09687
9	0.09250	0.08150	0.07475	0.10425	0.10200
10	0.08350	0.07500	0.07350	0.07750	0.10775
11	0.06850	0.07100	0.05825	0.07825	0.10550
12	-[a]	-	-	-	-
13	-	-	-	-	-
14	0.06750	0.11025	0.08075	0.12531	0.00125
15	0.05550	0.10075	0.07900	0.13200	0.00325
16	0.05300	0.10125	0.08425	0.11075	0.00075
17	0.05725	0.10350	0.09450	0.10969	0.00225
18	0.05375	0.11600	0.10225	0.11850	-0.01225
19	0.04825	0.11500	0.10325	0.10975	-0.02025
20	0.03850	0.10600	0.09150	0.09625	-0.02781
21	0.03375	0.10437	0.08531	0.09188	-0.03031
22	0.03250	0.10800	0.07875	0.08725	-0.02525
23	0.02350	0.12100	0.07100	0.07400	-0.02300
24	0.02275	0.12500	0.07950	0.07025	-0.01875
25	0.01550	0.12900	0.07225	0.05844	-0.02600
26	0.03344	0.12325	0.06425	0.04075	-0.02525
27	0.03225	0.12450	0.06375	0.02400	-0.02650
28	0.04150	0.12781	0.06825	0.01725	-0.03083

[a]Contract is not traded all or part of the week.

Table 26 (Continued)

Week	63-64	64-65	65-66	66-67	67-68
29	0.04275	0.12775	0.06525	0.00281	-0.02625
30	0.05525	0.12575	0.06525	-0.01650	-0.02600
31	0.06125	0.13450	0.06050	-0.01000	-0.02850
32	0.06825	0.14150	0.06550	-0.00575	-0.03100
33	0.06325	0.14675	0.06000	-0.00225	-0.02850
34	0.06475	0.13775	0.04575	0.00475	-0.03350
35	0.05562	0.13813	0.01906	-0.00063	-0.03812
36	0.05275	0.12500	0.01950	-0.00975	-0.04000
37	0.05300	0.11125	0.01525	0.00525	-0.04300
38	0.05775	0.11700	-0.00825	0.00900	-0.03525
39	0.06225	0.11125	-0.03800	0.00350	-0.03000
40	0.06313	0.10313	-0.03000	0.01875	-0.01583
41	0.06175	0.09375	-0.03400	0.02150	-0.01225
42	0.05050	-[a]	-	-	-
43	-	-	-	-	-
44	-	0.07750	0.08050	0.09150	0.06115
45	0.07900	0.07825	0.08550	0.09400	0.10050
46	0.08175	0.07975	0.09225	0.10225	0.10850
47	0.07800	0.07975	0.09650	0.10150	0.11525
48	0.07725	0.08350	0.10225	0.10425	0.11575
49	0.06975	0.08281	0.12031	0.09906	0.11406
50	0.06500	0.08600	0.11050	0.09844	0.10900
51	0.06625	0.08875	0.09500	0.10575	0.10800
52	0.07275	0.08812	0.10000	0.10400	0.11050

Table 27. Five year weekly average December-July corn spread

Week	Spread[a]	Week	Spread[a]
1	8.396	27	4.360
2	6.697	28	4.480
3	8.700	29	4.246
4	9.385	30	4.075
5	9.247	31	4.355
6	9.386	32	4.770
7	9.470	33	4.785
8	9.334	34	4.391
9	9.100	35	3.481
10	8.345	36	2.950
11	7.630	37	2.835
12	-[b]	38	2.805
13	-[b]	39	2.180
14	7.701	40	2.784
15	7.410	41	2.615
16	7.000	42	-[b]
17	7.344	43	-[b]
18	7.565	44	-[b]
19	7.120	45	8.745
20	6.089	46	9.290
21	5.700	47	9.420
22	5.625	48	9.660
23	5.330	49	9.720
24	5.575	50	9.379
25	4.984	51	9.275
26	4.729	52	9.507

[a]In cents per bushel.

[b]Contract is not traded all or part of the week.

APPENDIX B

Table 28. Weekly average central Iowa January soybean basis in dollars per bushel

Week	63-64	64-65	65-66	66-67	67-68
1	0.25438	0.23700	0.18812	0.20900	0.20750
2	0.29075	0.23450	0.21250	0.17700	0.20475
3	0.29750	0.24950	0.19550	0.16925	0.22300
4	0.27700	0.26225	0.17800	0.16825	0.25500
5	0.25200	0.24219	0.19400	0.16325	0.24900
6	0.24450	0.24100	0.19875	0.14281	0.23725
7	0.23050	0.22450	0.18400	0.13425	0.20875
8	0.18700	0.22531	0.17275	0.13156	0.19500
9	0.19667	0.21900	0.17313	0.13150	0.19225
10	0.17550	0.20150	0.17000	0.13750	0.17775
11	0.19275	0.19725	0.16900	0.13350	0.16225
12	0.18025	0.18312	0.18063	0.13625	0.14925
13	0.14719	0.20187	0.18438	0.14969	0.14594
14	0.13906	0.19125	0.20675	0.15125	0.15156
15	0.14375	0.18675	0.21500	0.15625	0.14875
16	0.13850	-[a]	-	-	-
17	-	-	-	-	-
18	-	-0.28025	0.08525	0.07708	0.13175
19	0.04000	-0.21975	0.00850	0.09100	0.16800
20	0.05675	-0.17250	0.02350	0.10675	0.16500
21	0.04687	-0.19656	0.08031	0.08906	0.17750
22	0.03900	-0.20850	0.11075	0.11500	0.18375
23	0.02475	-0.23025	0.07950	0.11025	0.18425
24	0.03600	-0.16490	0.04475	0.12625	0.19125
25	0.00475	-0.15850	0.01375	0.13562	0.17475
26	-0.00750	-0.21550	0.04500	0.15550	0.15000
27	0.01425	-0.22800	0.06781	0.14850	0.14350
28	0.03825	-0.19375	0.06325	0.14900	0.12292

[a]Contract is not traded all or part of the week.

Table 28 (Continued)

Week	63-64	64-65	65-66	66-67	67-68
29	0.02350	-0.20475	0.05475	0.13750	0.11250
30	0.03025	-0.13175	0.01325	0.14550	0.10575
31	0.05725	-0.14000	0.02025	0.15400	0.09475
32	0.08525	-0.12825	-0.00975	0.14000	0.08525
33	0.12050	-0.12075	-0.07625	0.14025	0.08925
34	0.12300	-0.11000	-0.10200	0.15025	0.09775
35	0.11844	-0.17750	-0.12656	0.15917	0.11531
36	0.12500	-0.21250	-0.11250	0.16900	0.12175
37	0.11425	-0.19725	-0.18850	0.11175	0.10650
38	0.11000	-0.26525	-0.28750	0.09750	0.11750
39	0.10700	-0.23275	-0.36725	0.10125	0.11075
40	0.11750	-0.15688	-0.27531	0.07344	0.08156
41	0.12475	-0.16175	-0.09775	0.08450	0.07500
42	0.11150	-0.08475	-0.02650	0.09025	0.06450
43	0.10775	-0.03900	-0.01800	0.12800	0.05200
44	0.11275	-0.06525	-0.07775	0.13600	0.02150
45	0.16025	-0.00300	-0.21275	0.14750	0.01825
46	0.17250	0.00625	-0.36000	0.15075	0.01675
47	0.19100	0.03675	-0.33950	0.09325	0.00475
48	0.21375	-0.02000	-0.29850	0.09275	0.00375
49	0.21200	-0.07094	-0.15187	0.14844	0.02500
50	0.21844	0.00250	0.24800	0.16531	0.05225
51	0.25050	-0.10825	0.23025	0.15175	0.07650
52	0.23800	-0.04094	0.22800	0.19075	0.12975

Table 29. Weekly average central Iowa March soybean basis in dollars per bushel

Week	63-64	64-65	65-66	66-67	67-68
1	0.28938	0.26775	0.22625	0.25675	0.24275
2	0.31825	0.26100	0.24925	0.21950	0.24025
3	0.32600	0.28025	0.23225	0.20400	0.25875
4	0.30800	0.29150	0.21400	0.20550	0.29300
5	0.29350	0.27156	0.23025	0.20525	0.28700
6	0.28050	0.27050	0.23500	0.16844	0.27725
7	0.26500	0.24825	0.21600	0.13875	0.25050
8	0.22600	0.25469	0.20150	0.11969	0.23844
9	0.23500	0.24750	0.20156	0.11075	0.23500
10	0.20725	0.23100	0.19100	0.10450	0.22025
11	0.22100	0.22475	0.20000	0.10300	0.20700
12	0.21525	0.21156	0.21031	0.10525	0.19700
13	0.18437	0.23062	0.21719	0.10969	0.19375
14	0.18000	0.22200	0.23500	0.11375	0.20125
15	0.17900	0.21850	0.23900	0.11775	0.19400
16	0.17525	0.22525	0.24350	0.14075	0.18100
17	0.16625	0.23250	0.23825	0.15063	0.16675
18	0.13725	0.23100	0.22650	0.14958	0.16250
19	0.12000	0.24825	0.22625	0.17150	0.15350
20	0.11125	0.21825	0.22100	0.17925	0.15188
21	0.10687	0.21719	0.21875	0.16938	0.16469
22	0.09850	0.21200	0.19600	0.17350	0.16100
23	0.12950	0.19800	0.17600	0.16550	0.17050
24	0.15325	-[a]	-	0.17125	0.16125
25	-	-	-	-	-
26	-	-0.02725	0.14500	-	-
27	0.10475	-0.19500	0.09844	0.17775	0.17650
28	0.04375	-0.16094	0.09450	0.18200	0.15667

[a]Contract is not traded all or part of the week.

Table 29 (Continued)

Week	63-64	64-65	65-66	66-67	67-68
29	0.04500	-0.17200	0.08575	0.16844	0.14525
30	0.06025	-0.09925	0.04400	0.17950	0.13850
31	0.08675	-0.10750	0.05325	0.18875	0.12775
32	0.11475	-0.10725	0.02250	0.17275	0.11850
33	0.15050	-0.08750	-0.04300	0.17350	0.12375
34	0.15425	-0.07625	-0.06925	0.18450	0.13125
35	0.14906	-0.14344	-0.09437	0.18625	0.14875
36	0.15775	-0.17750	-0.08150	0.20475	0.15550
37	0.14725	-0.16425	-0.15925	0.14825	0.13925
38	0.14225	-0.23075	-0.25700	0.12900	0.15000
39	0.14000	-0.19800	-0.33825	0.13100	0.14450
40	0.14937	-0.12594	-0.24531	0.10500	0.11844
41	0.15850	-0.12475	-0.06525	0.11500	0.11100
42	0.14150	-0.04850	0.00150	0.12025	0.09975
43	0.13700	-0.00625	0.01375	0.15775	0.08600
44	0.14525	-0.02975	-0.04475	0.16650	0.05375
45	0.19250	0.03275	-0.17875	0.17825	0.04975
46	0.20450	0.04050	-0.32200	0.18075	0.05125
47	0.21025	0.07150	-0.30025	0.12350	0.03475
48	0.24925	0.01625	-0.25500	0.12325	0.03375
49	0.24350	-0.03531	-0.10344	0.17844	0.05875
50	0.25031	0.03850	0.29850	0.19687	0.08525
51	0.28150	-0.07325	0.27725	0.18300	0.11125
52	0.26700	-0.00500	0.27825	0.22125	0.16175

Table 30. Weekly average central Iowa May soybean basis in dollars per bushel

Week	63-64	64-65	65-66	66-67	67-68
1	0.31687	0.28388	0.25312	0.28575	0.26875
2	0.35125	0.27850	0.27500	0.24250	0.26525
3	0.35600	0.29800	0.25500	0.22600	0.28325
4	0.34100	0.31200	0.23600	0.23475	0.31925
5	0.33050	0.29156	0.25300	0.23325	0.31175
6	0.32300	0.28675	0.25775	0.19250	0.30775
7	0.30750	0.25700	0.23825	0.16000	0.28075
8	0.26350	0.26187	0.22450	0.11950	0.27500
9	0.26750	0.25625	0.22406	0.11950	0.27425
10	0.24050	0.24025	0.21900	0.10575	0.26025
11	0.25900	0.23250	0.22325	0.10325	0.24600
12	0.25875	0.22438	0.23656	0.09825	0.23800
13	0.23656	0.24500	0.24125	0.09438	0.23375
14	0.22062	0.23875	0.25700	0.10406	0.24156
15	0.21225	0.23425	0.25200	0.10600	0.23325
16	0.20700	0.25025	0.26100	0.13350	0.21725
17	0.19675	0.26475	0.25875	0.12437	0.20275
18	0.16075	0.26500	0.23825	0.12000	0.19575
19	0.13475	0.27775	0.24725	0.14950	0.18550
20	0.12475	0.25700	0.24725	0.16575	0.18813
21	0.11906	0.25625	0.24656	0.15625	0.20281
22	0.11550	0.25475	0.23025	0.17375	0.20350
23	0.12975	0.23900	0.21325	0.16650	0.20450
24	0.13275	0.22060	0.18175	0.16800	0.20675
25	0.11000	0.21550	0.17200	0.18188	0.19100
26	0.10594	0.21350	0.17575	0.18600	0.17075
27	0.11375	0.21125	0.17344	0.17950	0.16300
28	0.12925	0.19625	0.17575	0.18475	0.15250
29					

Table 30 (Continued)

Week	63-64	64-65	65-66	66-67	67-68
30	0.14050	0.18600	0.17750	0.16375	0.14475
31	0.15550	0.16350	0.18575	0.16125	0.13875
32	0.17100	0.17700	0.18250	0.16575	0.13525
33	0.17800	-[a]	-	-	0.15550
34	-	-	-	-	-
35	-	-0.11875	-0.08812	0.18000	-
36	0.18125	-0.15500	-0.05575	0.22075	0.17450
37	0.17175	-0.14025	-0.13225	0.16375	0.15850
38	0.16825	-0.20650	-0.23550	0.14900	0.17025
39	0.16600	-0.17675	-0.32050	0.15175	0.16575
40	0.17531	-0.10344	-0.22875	0.12813	0.14250
41	0.18275	-0.11050	-0.04900	0.14000	0.13625
42	0.16750	-0.04050	0.02100	0.14775	0.12550
43	0.16075	-0.00275	0.03475	0.18300	0.11125
44	0.16975	-0.00475	-0.02385	0.19275	0.07625
45	0.21625	0.05800	-0.15925	0.20675	0.07275
46	0.22650	0.06575	-0.30175	0.20950	0.07550
47	0.23925	0.09800	-0.28150	0.14825	0.05750
48	0.27050	0.04025	-0.22775	0.14475	0.05575
49	0.26450	-0.01063	-0.07000	0.20031	0.08156
50	0.27187	0.06325	0.33125	0.22125	0.10850
51	0.30200	-0.05000	0.30325	0.20425	0.13575
52	0.28900	0.01906	0.31000	0.24350	0.18625

[a]Contract is not traded all or part of the week.

Table 31. Weekly average central Iowa July soybean basis in dollars per bushel

Week	63-64	64-65	65-66	66-67	67-68
1	0.33250	0.28300	0.26521	0.30300	0.28100
2	0.36050	0.27250	0.28700	0.25300	0.27550
3	0.37250	0.29200	0.26400	0.23500	0.29400
4	0.35600	0.31075	0.24150	0.24875	0.33100
5	0.34650	0.29062	0.25850	0.24375	0.32550
6	0.33900	0.28275	0.26375	0.20031	0.32150
7	0.32100	0.24175	0.24150	0.16750	0.29650
8	0.28100	0.25469	0.22725	0.14000	0.29625
9	0.28167	0.24875	0.22781	0.13200	0.29950
10	0.25100	0.22850	0.22450	0.10725	0.28100
1	0.26450	0.21800	0.23275	0.10550	0.26625
12	0.21500	0.20812	0.24750	0.09750	0.25975
13	0.18344	0.22281	0.24969	0.08875	0.25344
14	0.20156	0.22550	0.26400	0.09844	0.26219
15	0.23275	0.21600	0.25525	0.09650	0.25300
16	0.22500	0.23950	0.26500	0.12650	0.23475
17	0.21250	0.26425	0.26625	0.11094	0.21625
18	0.17400	0.26850	0.24150	0.10083	0.20975
19	0.14250	0.29225	0.25275	0.13600	0.20175
20	0.13275	0.26550	0.25775	0.14525	0.20344
21	0.12656	0.26000	0.25687	0.13844	0.21875
22	0.12575	0.26800	0.24300	0.16500	0.22600
23	0.12575	0.25175	0.22425	0.16425	0.23075
24	0.12450	0.23410	0.19175	0.17275	0.23625
25	0.09275	0.22450	0.18875	0.18187	0.22075
26	0.07219	0.21775	0.19225	0.18875	0.20175
27	0.08250	0.22000	0.19062	0.17925	0.19475
28	0.10100	0.20125	0.19700	0.18125	0.18333
29	0.09950	0.19575	0.20425	0.16469	0.17525

Table 31 (Continued)

Week	63-64	64-65	65-66	66-67	67-68
30	0.09550	0.20625	0.21375	0.16674	0.17375
31	0.11850	0.18050	0.22900	0.17075	0.16750
32	0.13725	0.18925	0.20900	0.16475	0.15600
33	0.16500	0.18600	0.17625	0.15675	0.16150
34	0.15975	0.20050	0.17500	0.16125	0.15800
35	0.14750	0.19094	0.16844	0.16500	0.16594
36	0.15500	0.17850	0.17125	0.17525	0.17550
37	0.14375	0.17675	0.17250	0.16475	0.16850
38	0.14225	0.18150	0.16850	0.16475	0.16325
39	0.13675	0.19500	0.17075	0.15675	0.16400
40	0.13250	0.21625	0.19750	0.15844	0.16156
41	0.14200	0.24150	0.18475	0.18550	0.15375
42	0.15825	-[a]	-	-	-
43	-	-	-	-	-
44	-	0.01000	-0.01500	0.21375	0.12650
45	0.23000	0.07100	-0.14300	0.21750	0.07375
46	0.23825	0.07825	-0.28450	0.22250	0.07750
47	0.24800	0.11000	-0.26600	0.16250	0.06150
48	0.28125	0.05050	-0.21300	0.15400	0.05950
49	0.27175	-0.00062	-0.04844	0.20656	0.08531
50	0.27594	0.07250	0.35725	0.22906	0.11100
51	0.30350	-0.04175	0.32725	0.21300	0.13775
52	0.28800	0.02344	0.33025	0.25400	0.18825

[a]Contract is not traded all or part of the week.

Table 32. Weekly average central Iowa August soybean basis in dollars per bushel

Week	63-64	64-65	65-66	66-67	67-68
1	0.30437	0.22588	0.24062	0.25950	0.26535
2	0.32900	0.21500	0.26250	0.21325	0.25650
3	0.33100	0.23300	0.23325	0.19225	0.27550
4	0.31000	0.25650	0.20775	0.21200	0.31250
5	0.29600	0.23000	0.22175	0.20975	0.30925
6	0.27850	0.22300	0.22500	0.16344	0.30475
7	0.27500	0.17525	0.20475	0.12575	0.28400
8	0.24475	0.18844	0.18725	0.10688	0.29562
9	0.24667	0.18650	0.18688	0.09925	0.29700
10	0.21200	0.16475	0.18125	0.07525	0.27675
11	0.22500	0.15175	0.19475	0.07625	0.25950
12	0.21500	0.13875	0.20750	0.06900	0.25350
13	0.18375	0.16906	0.21312	0.05969	0.24938
14	0.17531	0.16475	0.22675	0.06875	0.25594
15	0.19050	0.15100	0.21150	0.06600	0.24500
16	0.18100	0.15425	0.22450	0.09450	0.22300
17	0.16625	0.18450	0.22625	0.07969	0.20400
18	0.13925	0.19250	0.20225	0.06750	0.20025
19	0.11000	0.22650	0.21050	0.10125	0.19200
20	0.10600	0.21450	0.21525	0.11900	0.19406
21	0.09062	0.19625	0.21625	0.11188	0.20844
22	0.08925	0.20100	0.21350	0.14350	0.21775
23	0.09575	0.17800	0.19150	0.14675	0.22200
24	0.07775	0.15885	0.15975	0.15500	0.23025
25	0.05375	0.15575	0.15550	0.16500	0.21925
26	0.02719	0.14750	0.15525	0.17200	0.20100
27	0.04050	0.15850	0.15906	0.16700	0.19750
28	0.06075	0.14906	0.16850	0.16925	0.18375
29	0.05850	0.13825	0.18600	0.15344	0.17150

Table 32 (Continued)

Week	63-64	64-65	65-66	66-67	67-68
30	0.05750	0.15425	0.19350	0.15550	0.16650
31	0.08975	0.13125	0.20050	0.16450	0.15700
32	0.11150	0.14200	0.17800	0.15625	0.14425
33	0.14225	0.13900	0.13600	0.14875	0.14650
34	0.14000	0.14925	0.13825	0.15600	0.14375
35	0.12781	0.12281	0.14031	0.15542	0.15344
36	0.12650	0.12775	0.15500	0.17025	0.16475
37	0.11825	0.08375	0.15125	0.13850	0.16200
38	0.11825	0.07625	0.10525	0.13400	0.16375
39	0.11950	0.09375	0.09925	0.13175	0.16625
40	0.11969	0.11906	0.14562	0.11563	0.15656
41	0.12900	0.13300	0.15050	0.13400	0.14625
42	0.13175	0.16450	0.14075	0.14375	0.13125
43	0.14225	0.18050	0.14175	0.16425	0.13050
44	0.15850	0.18025	0.14325	0.18250	0.12275
45	0.18200	0.21850	0.13350	0.18150	0.12725
46	0.19075	-[a]	-	-	0.13150
47	-	-	-	-	-
48	-	0.09075	0.10100	0.16650	-
49	0.23100	-0.03031	-0.08562	0.19125	0.06000
50	0.23625	0.04375	0.31875	0.21125	0.08200
51	0.25400	-0.07125	0.29325	0.18975	0.11150
52	0.23750	0.00406	0.29375	0.23375	0.15450

[a]Contract is not traded all or part of the week.

Table 33. Weekly average central Iowa September soybean basis in dollars per bushel

Week	63-64	64-65	65-66	66-67	67-68
1	-[a]	0.08338	0.17604	0.14350	0.21800
2	-	0.02950	0.18750	0.11425	0.21225
3	-	0.03475	0.16075	0.09275	0.24125
4	0.17000	0.07400	0.13575	0.13775	0.28150
5	0.03075	0.02062	0.14125	0.12775	0.28150
6	0.04750	0.00750	0.13600	0.09156	0.27000
7	0.00900	-0.07825	0.12400	0.06275	0.24500
8	0.04800	-0.08219	0.12275	0.04250	0.25906
9	0.06333	-0.08375	0.12406	0.03400	0.26900
10	0.07125	-0.09800	0.12225	0.00950	0.24700
11	0.06225	-0.09450	0.13875	0.02675	0.22550
12	0.02575	-0.12063	0.15656	0.03025	0.21400
13	-0.06125	-0.04375	0.16906	0.01781	0.20813
14	-0.04656	-0.04100	0.15400	0.03969	0.21563
15	-0.00300	-0.09250	0.10950	0.03400	0.19650
16	0.01050	-0.13325	0.09300	0.06400	0.17125
17	0.02300	-0.16525	0.10250	0.04719	0.15225
18	0.04725	-0.20050	0.08200	0.03458	0.15675
19	0.02625	-0.15875	0.05825	0.07525	0.15650
20	0.03700	-0.11800	0.06550	0.08800	0.15469
21	0.03031	-0.13812	0.10656	0.07531	0.16781
22	0.02325	-0.14575	0.11525	0.10525	0.17550
23	0.00625	-0.16825	0.08925	0.09600	0.17400
24	0.01575	-0.12190	0.05550	0.11200	0.17975
25	-0.01400	-0.12575	0.03050	0.12250	0.15725
26	-0.02906	-0.16825	0.05275	0.13725	0.13450
27	-0.00600	-0.17900	0.07500	0.12950	0.13125
28	0.00675	-0.14750	0.07675	0.13325	0.11458
29	-0.00325	-0.16050	0.07275	0.12406	0.09800

[a]Contract is not traded all or part of the week.

Table 33 (Continued)

Week	63-64	64-65	65-66	66-67	67-68
30	0.00950	-0.10525	0.04650	0.13150	0.09250
31	0.03500	-0.11450	0.04425	0.13625	0.08350
32	0.06275	-0.10000	0.01625	0.12200	0.07150
33	0.09625	-0.10175	-0.05050	0.11875	0.07725
34	0.09750	-0.09075	-0.06025	0.12875	0.08450
35	0.09156	-0.14531	-0.05187	0.13833	0.10000
36	0.10025	-0.17600	-0.03425	0.15050	0.11000
37	0.08625	-0.17050	-0.09100	0.09475	0.09725
38	0.08125	-0.21575	-0.15600	0.08175	0.10400
39	0.07825	-0.19275	-0.22725	0.08525	0.09900
40	0.08531	-0.12969	-0.17156	0.05688	0.07813
41	0.09175	-0.13150	-0.01825	0.06225	0.06650
42	0.08400	-0.06675	0.03725	0.07025	0.05425
43	0.08125	-0.02725	0.03825	0.11075	0.04400
44	0.08625	-0.05000	0.02675	0.12425	0.02250
45	0.13175	0.00175	-0.07275	0.13450	0.01700
46	0.14125	0.00050	-0.17000	0.14700	0.02050
47	0.15250	0.03575	-0.10875	0.12650	0.03950
48	0.17475	-0.00150	-0.11800	0.14500	0.05075
49	0.17125	-0.03531	-0.07688	0.18313	0.05625
50	0.18062	0.03500	0.30225	0.19250	0.07600
51	-[a]	-	-	-	-
52	-	-	-	-	-

Table 34. Weekly average central Iowa November soybean basis in dollars per bushel

Week	63-64	64-65	65-66	66-67	67-68
1	0.20812	0.21063	0.14812	0.16000	0.17450
2	0.25125	0.20725	0.17350	0.13550	0.17275
3	0.25250	0.31200	0.15800	0.13875	0.19050
4	0.23075	0.22175	0.14325	0.13250	0.21450
5	0.20950	0.19781	0.15300	0.14225	0.20925
6	0.20450	0.20375	0.16000	0.13406	0.19725
7	0.19450	-[a]	-	-	-
8	-	-	-	-	-
9	-	-0.10000	0.09656	0.10050	0.19000
10	0.08050	-0.17525	0.08950	-0.03750	0.22150
11	0.02400	-0.16625	0.09750	-0.00875	0.19675
12	-0.01975	-0.20125	0.11188	0.00475	0.18425
13	-0.13125	-0.10562	0.11906	-0.01000	0.17844
14	-0.10125	-0.10175	0.09550	0.01188	0.18625
15	-0.04875	-0.17350	0.03575	0.00400	0.16650
16	-0.02750	-0.25200	0.02400	0.03475	0.14125
17	-0.00950	-0.27775	0.03800	0.01813	0.12125
18	0.02450	-0.31175	0.01675	0.00667	0.13475
19	0.00475	-0.25600	-0.01450	0.05375	0.13350
20	0.02050	-0.20725	-0.00825	0.07150	0.13094
21	0.01062	-0.23281	0.04875	0.05281	0.14156
22	0.00225	-0.24400	0.07700	0.08075	0.14725
23	-0.01200	-0.26950	0.04750	0.07600	0.14650
24	-0.00100	-0.19890	0.01225	0.09225	0.15425
25	-0.03300	-0.19500	-0.02325	0.10219	0.13750
26	-0.04031	-0.25125	0.01050	0.12100	0.11300
27	-0.01850	-0.26400	0.03031	0.11325	0.10725
28	-0.00725	-0.22938	0.02275	0.11325	0.08750

[a]Contract is not traded all or part of the week.

Table 34 (Continued)

Week	63-64	64-65	65-66	66-67	67-68
29	-0.01625	-0.24100	0.01500	0.10125	0.07550
30	-0.00375	-0.16950	-0.02675	0.10950	0.06800
31	0.01975	-0.17700	-0.02000	0.11675	0.05675
32	0.04925	-0.16600	-0.04950	0.10325	0.04775
33	0.08325	-0.15675	-0.11550	0.10275	0.05175
34	0.08275	-0.14700	-0.14150	0.11350	0.06075
35	0.08875	-0.21625	-0.16750	0.12292	0.07875
36	0.08550	-0.24900	-0.14025	0.13300	0.08475
37	0.07550	-0.23300	-0.22775	0.07674	0.06875
38	0.07125	-0.30175	-0.32575	0.06100	0.07900
39	0.06850	-0.27025	-0.40575	0.06375	0.07150
40	0.07625	-0.19531	-0.31687	0.03375	0.04250
41	0.08525	-0.19650	-0.13600	0.04500	0.03600
42	0.07100	-0.12075	-0.06350	0.05275	0.02600
43	0.06925	-0.07675	-0.05625	0.09100	0.01600
44	0.07375	-0.10250	-0.11650	0.09900	-0.00825
45	0.12075	-0.03950	-0.25325	0.11050	-0.01300
46	0.13275	-0.03000	-0.40100	0.11250	-0.01525
47	0.14900	0.00125	-0.38050	0.05650	-0.02975
48	0.17400	-0.05575	-0.34250	0.05850	-0.03350
49	0.17125	-0.10719	-0.20625	0.11500	-0.01062
50	0.18000	-0.03425	0.19525	0.13469	0.01750
51	0.20900	-0.14400	0.17975	0.12150	0.04200
52	0.20250	-0.07969	0.13725	0.16250	0.09700

Table 35. Daily average revenue in cents per bushel for soybean storage by weeks of the crop year October 1, 1963 to October 1, 1964

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
1	3.125	-2.312	3.125	13.125	11.594	14.500	22.594	-3.500	14.906	-16.687
2	5.100	1.500	8.775	-5.200	16.375	5.900	26.050	-8.300	18.825	-26.800
3	6.975	19.800	10.200	3.550	18.925	18.400	24.075	-1.400	23.575	-11.600
4	5.150	19.200	10.300	2.050	14.750	13.700	20.800	-4.400	22.550	-13.000
5	3.125	-6.900	8.875	-4.400	16.725	-4.600	19.450	-18.500	20.850	-24.300
6	4.675	-14.750	10.525	0.500	17.425	-7.550	17.950	-24.500	20.725	-29.550
7	7.450	-13.450	9.075	4.500	18.025	-4.550	14.350	-26.000	19.750	-28.350
8	3.562	3.900	6.000	12.500	14.750	4.100	10.050	-20.200	15.950	-15.100
9	2.700	11.917	8.833	14.750	15.250	4.833	14.500	-16.500	16.000	-13.417
10	-1.850	18.650	6.825	13.950	11.450	4.800	11.725	-14.800	12.500	-14.900
11	-1.063	13.450	8.800	4.800	9.300	2.200	13.000	-16.450	12.225	-18.800
12	-0.900	6.000	10.050	-2.550	8.125	-4.900	8.125	-23.400	8.275	-26.100
13	-2.125	-3.937	9.250	-10.125	15.125	-16.438	5.438	-33.812	3.938	-36.312
14	4.406	-5.125	9.656	-6.688	12.500	-14.813	7.969	-28.938	0.969	-31.625
15	5.450	-7.850	10.150	-6.600	12.550	-12.950	11.125	-25.550	1.350	-29.150
16	7.550	-3.600	8.675	-6.800	8.025	-17.450	10.325	-25.200	-0.475	-25.200
17	8.350	2.250	5.375	-0.100	6.700	-12.700	7.525	-22.350	-13.725	-21.100
18	5.975	3.400	0.200	0.000	2.225	-11.450	2.450	-19.300	-10.700	-14.150
19	3.150	-1.400	4.425	-2.950	-1.025	-15.900	-3.150	-24.050	-12.875	-16.300
20	-0.125	1.300	3.350	-4.750	-4.600	-19.350	-5.700	-22.100	-15.200	-3.500
21	-2.781	-0.500	2.875	-2.563	-3.906	-20.625	-8.375	-19.563	-17.125	0.750
22	-4.000	0.150	0.025	-8.600	-1.100	-18.800	-9.150	-17.700	-17.750	-0.900
23	3.650	-4.400	-0.325	-11.000	-0.475	-19.600	-14.225	-19.300	-20.075	2.150
24	4.200	-0.500	-0.325	-9.050	-1.350	-14.800	-14.825	-12.900	-16.550	4.650
25	-0.525	-6.100	-3.350	-11.000	-3.900	-16.050	-16.050	-10.900	-21.625	0.700
26	-2.781	-5.187	-5.375	-10.063	-5.187	-13.500	-21.375	-2.125	-24.781	-0.813

Table 35 (Continued)

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
27	-2.025	-5.400	-6.975	-16.100	-3.875	-11.350	-20.700	6.250	-20.525	0.700
28	-1.300	-3.250	-3.650	-9.450	-2.050	-6.550	-18.525	9.300	-18.950	10.200
29	-1.500	-4.100	-3.250	-7.600	-3.075	-8.200	-20.450	12.400	-17.625	17.750
30	-3.000	-9.400	-4.100	-5.050	-4.800	-7.500	-16.950	15.400	-17.275	27.450
31	-1.900	-4.750	-1.525	-3.900	-4.700	-6.800	-16.225	12.800	-15.375	31.000
32	0.525	-1.700	1.300	-1.800	-4.150	-4.750	-15.400	11.850	-15.375	31.950
33	2.865	5.950	4.375	6.350	-2.875	3.500	-10.350	18.400	-11.650	37.100
34	2.600	2.500	3.825	4.550	-3.975	1.950	-9.950	21.300	-10.500	36.200
35	2.281	1.500	2.000	1.625	-4.500	2.750	-7.625	26.375	-10.656	25.313
36	3.375	2.000	1.275	-0.600	-7.150	2.700	-7.575	32.800	-7.575	26.250
37	2.175	3.200	-1.400	-1.600	-6.050	5.750	-9.325	35.900	-8.500	36.150
38	1.625	2.000	-3.075	-1.450	-8.525	9.400	-12.425	36.800	-10.850	41.750
39	-0.550	-1.300	-4.900	-1.050	-12.575	18.900	-13.150	31.850	-11.250	44.300
40	-0.938	-3.250	-5.938	-2.813	-10.000	16.375	-11.219	33.062	-10.781	46.687
41	-1.550	-1.950	-6.650	2.550	-10.075	20.000	-10.300	28.350	-10.125	44.900
42	-3.575	1.100	-8.675	3.400	-11.375	25.850	-9.425	27.700	-7.250	43.550
43	-3.535	2.200	-6.350	8.400	-9.200	21.400	-8.850	36.850	-5.825	50.250
44	-3.700	5.350	-7.325	10.150	-12.175	19.350	-10.100	43.350	-4.275	51.600
45	-3.900	2.900	-6.225	20.700	-7.850	14.250	-6.100	45.900	0.250	49.900
46	-0.350	7.700	-4.150	20.400	-4.575	21.350	-5.200	50.150	3.325	43.450
47	-0.700	6.250	-2.250	18.900	-2.725	21.350	-4.950	43.800	4.575	41.300
48	-1.925	16.600	0.375	21.250	1.700	29.100	3.525	38.950	6.850	45.450
49	-0.725	15.200	2.350	15.500	0.475	32.550	4.825	44.350	5.925	56.700
50	-0.219	14.000	-1.187	11.875	-0.813	31.937	5.625	42.250	6.625	39.812
51	1.975	6.300	0.750	-4.900	1.025	16.650	9.675	32.150	10.550	29.550
52	4.050	4.150	1.475	2.500	0.525	17.750	8.825	27.450	10.150	22.350

Table 36. Daily average revenue in cents per bushel for soybean storage by weeks of the crop year October 1, 1964 to October 1, 1965

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
1	1.363	-4.650	3.125	6.300	1.725	8.275	8.713	24.725	10.538	12.575
2	2.825	4.400	2.825	21.950	4.000	18.350	7.425	36.250	10.700	15.650
3	3.525	6.200	2.700	21.650	2.500	25.100	9.150	30.950	13.350	13.500
4	6.575	19.900	2.200	23.250	4.050	32.500	11.550	36.150	15.975	27.850
5	3.562	19.000	0.531	15.500	1.812	30.000	10.219	22.000	14.156	22.437
6	2.700	17.800	1.375	15.450	0.675	29.250	10.250	15.450	14.400	21.300
7	-1.850	6.350	0.875	-3.750	0.275	12.950	8.350	2.750	9.275	19.050
8	-1.063	-0.875	3.000	-5.625	7.344	12.812	8.812	-2.375	9.469	11.125
9	-0.900	-1.000	1.400	2.850	4.600	10.700	9.050	-9.200	5.875	-0.700
10	-2.125	-13.950	-1.500	2.850	4.825	11.300	7.525	-3.850	-0.150	-7.850
11	0.125	-8.850	-3.100	9.200	3.925	9.300	6.725	3.500	0.825	-11.300
12	-1.844	-1.938	-4.781	10.062	5.312	1.375	6.656	-0.500	-1.844	-11.563
13	-1.813	13.812	-3.062	16.250	5.219	15.500	8.344	15.937	0.844	-1.625
14	-3.150	17.000	0.800	14.150	3.675	20.650	6.925	19.500	-2.950	-7.900
15	-3.800	10.850	2.325	10.250	2.900	12.600	4.175	2.900	-6.550	-21.150
16	-3.450	1.000	3.725	4.900	4.550	1.850	2.225	-11.650	-13.775	-30.300
17	1.850	-5.650	4.250	1.200	7.100	-1.650	2.925	-22.100	-14.675	-27.940
18	3.575	-3.950	5.975	-10.050	7.850	-15.100	3.925	-22.950	-9.850	-22.600
19	6.025	4.100	8.425	-2.300	9.800	-12.100	6.775	-18.900	-13.175	-23.100
20	2.825	7.500	5.500	7.150	8.150	-9.850	2.025	-21.400	0.450	-4.950
21	4.125	-3.125	5.219	5.250	9.875	-15.750	-1.594	-28.562	-15.687	-23.875
22	5.975	-5.650	4.825	-0.650	10.950	-18.100	-15.050	-32.900	-35.800	-46.350
23	4.050	-0.100	4.250	-0.950	10.075	-9.250	-16.000	-30.350	-42.825	-51.700
24	1.635	10.010	3.310	-1.990	8.685	-1.290	-3.340	-12.540	-32.540	-41.390
25	0.900	5.550	3.450	-7.250	8.625	-1.150	-7.925	-17.800	-31.175	-38.200
26	1.700	-0.250	3.750	-15.900	6.500	3.000	-5.700	-12.850	-36.400	-44.600

Table 36 (Continued)

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
27	2.375	-10.950	5.450	-19.550	5.125	-7.650	-16.250	-25.100	-37.700	-45.700
28	1.094	-12.625	4.250	-18.625	0.250	-13.188	-33.188	-44.688	-34.719	-39.375
29	1.450	-17.150	4.500	-11.250	-4.075	-18.800	-40.450	-52.350	-33.850	-39.500
30	3.575	-7.250	5.525	1.550	0.925	-11.150	-29.925	-40.000	-26.375	-28.800
31	2.150	-7.400	4.175	5.000	-2.700	-8.050	-29.450	-33.000	-27.100	-17.900
32	3.850	5.350	4.025	15.750	-3.225	-7.750	-28.025	-28.800	-26.550	-13.950
33	3.500	12.350	2.200	16.800	-7.325	-11.550	-26.950	-24.400	-27.000	-12.650
34	6.175	15.600	0.550	9.000	-8.900	-9.750	-26.325	-17.800	-26.550	-8.900
35	4.594	13.000	-4.531	-3.312	-14.437	-18.125	-31.146	-25.375	-36.125	-14.438
36	1.750	8.650	-1.575	11.400	-13.400	-14.750	-34.925	-28.900	-39.850	-11.250
37	-1.325	-0.900	-7.225	-8.050	-7.175	-7.800	-32.425	-19.600	-37.300	-3.400
38	-4.850	-13.150	-9.250	-19.550	-18.850	-19.850	-39.950	-26.200	-44.200	-11.550
39	-4.975	-15.500	-11.125	-23.950	-9.175	-7.900	-38.050	-26.350	-39.575	-8.600
40	-3.813	-3.313	-10.844	-15.937	-16.719	-15.688	-30.875	-14.750	-32.469	7.500
41	-2.975	-4.300	-13.625	-15.650	-35.975	-34.400	-33.575	-12.900	-32.525	9.400
42	-3.350	-5.350	-3.225	-2.400	-27.275	-27.250	-27.025	0.000	-23.850	10.650
43	-4.475	-9.600	8.325	4.700	-19.875	-24.900	-23.150	6.700	-17.000	4.250
44	-5.475	-9.250	-4.150	-2.450	-21.575	-20.900	-24.350	10.100	-16.950	11.000
45	3.625	5.300	15.750	18.700	-15.150	-13.100	-16.850	16.000	-9.225	19.100
46	11.100	15.600	1.075	2.850	-14.400	-9.800	-15.475	23.000	-8.975	22.850
47	4.425	9.050	-16.200	-16.500	-10.425	-3.600	-12.900	27.300	-4.450	25.750
48	14.125	16.300	-20.775	-21.950	-15.375	-10.300	-17.375	15.950	-10.650	20.850
49	-1.250	0.625	-22.875	-22.312	-20.094	-8.812	-20.500	6.750	-17.281	19.813
50	-20.325	-22.050	-15.000	-14.200	-12.900	1.050	-10.150	17.200	-9.900	28.600
51	-30.075	-33.100	-25.600	-26.750	-25.125	-13.400	-20.175	5.750	-21.825	19.700
52	-20.219	-22.187	-19.344	-17.875	-19.031	-4.400	-18.031	14.125	-14.313	30.625

Table 37. Daily average revenue in cents per bushel for soybean storage by weeks of the crop year October 1, 1965 to October 1, 1966

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
1	3.187	5.458	3.000	10.583	2.229	19.208	10.521	41.458	9.833	55.500
2	6.150	8.350	8.150	13.800	2.700	27.700	13.275	44.100	13.400	62.700
3	4.500	7.200	6.300	15.750	0.900	34.700	9.300	44.950	12.225	64.500
4	2.350	8.400	4.650	18.150	0.000	34.500	7.375	45.700	10.250	69.800
5	6.300	9.300	5.100	17.200	2.450	32.250	8.475	50.300	11.575	67.250
6	6.625	12.550	4.950	16.150	4.375	37.150	9.775	51.950	11.475	76.950
7	5.250	13.650	1.475	12.000	1.325	35.800	8.275	48.650	9.550	92.250
8	2.975	11.800	-1.275	17.800	0.900	31.550	16.875	52.800	9.050	114.600
9	2.375	6.750	-1.469	21.375	2.688	19.625	8.594	51.500	6.719	99.812
10	0.925	2.350	-1.900	20.600	4.650	19.750	8.400	54.000	8.625	93.450
11	-1.450	7.000	-1.450	17.550	6.725	21.050	9.125	53.250	11.100	90.600
12	-1.000	16.500	2.531	21.500	8.781	22.813	10.406	59.188	12.313	83.938
13	-0.844	20.313	1.438	26.625	8.719	25.938	10.000	74.437	13.188	86.563
14	2.375	14.550	3.650	21.100	11.625	19.600	12.200	88.200	15.025	94.250
15	4.125	7.600	5.200	7.550	10.000	14.600	12.150	95.550	15.200	109.300
16	4.350	9.150	8.750	1.200	10.025	14.050	10.525	75.900	24.900	98.700
17	3.975	9.500	10.025	5.100	9.675	16.000	11.225	76.250	28.775	97.750
18	3.950	2.350	10.400	5.100	6.600	22.100	11.900	67.740	23.550	85.900
19	7.025	-5.900	9.275	1.250	9.475	14.350	12.875	61.250	6.225	41.900
20	8.300	-1.500	10.650	1.400	9.900	18.550	13.875	76.050	19.425	13.600
21	9.562	6.625	9.812	11.000	10.750	29.500	15.625	102.500	7.000	15.625
22	7.475	10.750	6.900	15.950	10.350	36.350	29.225	104.550	9.050	16.150
23	7.075	6.750	5.025	14.600	8.400	38.450	26.700	98.300	9.575	12.500
24	3.500	6.150	1.075	17.875	5.100	33.550	22.150	85.950	9.425	16.900
25	1.075	6.550	1.625	15.100	3.800	45.700	-4.250	50.350	11.850	14.200
26	1.275	11.400	2.475	20.050	4.750	66.800	-17.875	20.450	-8.775	12.250

Table 37 (Continued)

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
27	0.344	13.250	13.656	20.125	5.406	82.625	-14.464	7.813	-6.125	11.875
28	1.575	10.950	5.525	2-.300	3.875	66.950	-10.650	2.450	-8.550	11.400
29	1.750	8.150	6.525	24.800	7.125	64.450	-13.500	-1.600	-3.650	10.300
30	12.175	6.700	7.100	15.750	10.925	52.800	-13.700	-2.100	-7.225	3.350
31	8.725	13.300	8.000	28.950	11.700	46.050	-11.725	2.500	-7.475	8.500
32	7.000	18.300	6.300	45.250	9.925	55.800	-14.775	-4.400	-11.175	5.700
33	3.350	11.250	3.950	64.000	6.875	68.500	-20.750	-6.250	-20.700	-2.800
34	2.600	17.650	1.675	48.650	-2.325	73.700	-24.975	-6.900	-23.000	-9.600
35	2.281	26.938	3.281	41.063	11.188	64.063	-21.687	-12.000	-25.531	-19.000
36	3.225	52.700	7.125	40.800	14.875	60.500	-19.600	-9.650	-24.325	-16.350
37	1.675	36.550	6.700	22.150	-3.775	29.100	-28.550	-18.900	-26.800	-31.800
38	3.025	13.250	2.500	9.000	-35.200	-31.300	-38.625	-36.600	-38.350	-49.200
39	1.550	-11.400	2.675	3.900	-58.575	-68.900	-49.300	-62.500	-47.275	-73.600
40	6.125	-8.563	6.562	32.875	-43.563	-60.625	-40.813	-55.750	-40.281	-68.875
41	6.900	-2.150	13.375	25.050	-29.650	-60.950	-22.325	-53.600	-22.200	-64.650
42	6.575	17.550	22.700	28.300	-19.100	-53.500	-15.750	-51.450	-14.600	-59.300
43	6.475	44.900	15.100	20.400	-15.500	-38.200	-13.025	-47.500	-13.875	-50.850
44	11.700	30.950	-14.950	-28.200	-21.300	-49.500	-16.700	-52.250	-18.800	-56.500
45	-5.725	13.400	-48.700	-65.700	-34.750	-65.400	-30.925	-70.050	-31.575	-74.750
46	-28.500	-19.400	-52.925	-86.100	-49.175	-80.350	-47.850	-93.800	-45.725	-95.000
47	-39.100	-55.900	-54.100	-82.750	-42.775	-70.100	-45.700	-86.450	-44.125	-88.150
48	-52.625	-69.700	-47.000	-72.400	-38.275	-63.850	-40.250	-78.200	-39.125	-81.700
49	-32.375	-62.875	-30.625	-54.375	-24.844	-51.437	-25.844	-66.937	-23.375	-72.375
50	3.025	-13.650	9.950	-6.900	15.275	1.550	15.625	-15.750	17.450	-21.950
51	4.175	-4.400	8.425	-1.200	11.725	6.900	10.400	-8.700	15.450	-16.600
52	3.775	8.400	5.050	5.750	9.400	6.000	15.525	-7.900	16.200	-10.600

Table 38. Daily average revenue in cents per bushel for soybean storage by weeks of the crop year October 1, 1966 to October 1, 1967

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
1	6.425	7.300	2.675	12.200	8.325	8.100	12.575	-5.550	16.625	-6.800
2	4.000	2.700	8.750	9.550	4.575	2.650	8.000	-8.100	11.825	-6.150
3	5.200	0.750	7.775	6.750	4.825	-4.300	6.250	-14.100	8.125	-11.950
4	-0.075	10.300	7.300	13.850	8.375	0.350	7.800	-9.650	8.625	-8.150
5	8.375	10.550	6.025	11.800	7.850	0.950	8.450	-11.700	8.850	-8.000
6	5.250	10.437	0.740	5.125	1.875	-5.750	4.687	-11.625	4.656	-9.000
7	4.025	8.350	0.800	1.200	-1.800	-12.150	2.200	-14.250	1.275	-15.500
8	2.688	5.625	0.281	-2.812	-3.281	-11.437	0.563	-13.187	-2.719	-18.250
9	0.075	1.900	-0.175	-4.100	-4.075	-10.800	-1.175	-13.050	-5.700	-20.050
10	0.950	-2.800	-0.650	-9.350	-4.350	-12.750	-5.475	-16.150	-6.050	-22.200
11	0.500	-5.550	-2.450	-8.750	-4.625	-12.700	-5.300	-18.450	-8.900	-28.300
12	0.300	-4.400	-3.650	-9.800	-5.850	-13.700	-5.675	-14.700	-10.450	-26.200
13	0.000	-5.000	-4.687	-11.700	-6.344	-12.062	-6.188	-13.500	-12.313	-26.375
14	-1.125	-1.312	-4.375	-7.562	-5.594	-9.625	-6.438	-14.000	-11.125	-22.812
15	-1.275	-1.150	-2.975	-5.300	-5.750	-8.800	-8.675	-13.950	-8.225	-17.200
16	-1.575	-2.600	-1.175	0.550	-2.950	-4.600	-5.375	-8.400	-4.175	-8.500
17	-0.562	-4.125	0.844	-1.812	-3.150	-8.562	-7.125	-14.500	-9.000	-13.125
18	-0.125	-3.333	-0.667	-1.833	-3.042	-10.917	-9.958	-17.333	-14.083	-21.083
19	2.000	2.400	-0.725	-0.200	0.450	-4.500	-7.225	-12.700	-11.000	-15.850
20	3.125	5.650	0.775	1.550	2.350	-0.100	-6.400	-13.050	-4.325	-14.550
21	2.500	3.188	-0.531	-1.062	0.650	-1.312	-6.594	-13.125	-8.250	-22.062
22	1.600	0.550	1.050	-1.950	2.250	0.650	-0.825	-8.500	-7.025	-22.400
23	1.000	-2.250	0.700	-2.800	0.450	-1.500	-1.550	-7.400	-9.175	-24.750
24	0.700	-2.250	1.125	-6.500	1.450	-3.600	-4.275	-13.000	-9.650	-28.400
25	1.875	0.688	3.438	-3.000	2.594	0.875	-6.687	-14.687	-10.344	-26.562
26	2.300	2.200	3.775	0.750	3.725	2.500	1.450	-10.600	-6.375	-22.850

Table 38 (Continued)

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
27	2.375	-1.500	4.450	0.800	1.775	-2.400	-1.325	-17.600	-5.450	-21.950
28	3.650	-1.500	4.500	5.000	-0.200	-2.650	-3.925	-19.300	-3.000	-17.650
29	3.094	-0.063	0.906	3.375	-1.750	-2.063	-6.063	-19.125	-2.188	-17.563
30	3.100	2.700	0.425	3.250	0.800	-4.150	-6.775	-20.050	-0.075	-15.200
31	3.600	7.650	1.550	4.800	-0.200	-5.550	-9.200	-22.800	1.625	-12.700
32	1.100	5.050	1.225	3.800	-2.250	-8.050	-8.175	-22.250	1.175	-12.000
33	-0.575	2.350	-0.200	-0.350	-3.400	-11.800	-6.900	-20.950	1.000	-13.100
34	0.600	-0.500	-1.575	-4.700	-1.975	-9.250	-3.625	-20.750	2.000	-17.050
35	1.083	1.333	-2.208	-4.000	4.708	-2.333	-0.667	-19.083	3.458	-16.417
36	2.275	-1.250	3.450	-4.600	2.650	-5.500	1.925	-18.400	4.725	-14.400
37	-0.175	-2.350	-2.675	-9.400	-6.850	-10.750	02.975	-17.150	-0.550	-10.250
38	-2.425	-4.250	-3.950	-10.100	-10.350	-13.250	-3.375	-15.150	-2.875	-10.600
39	-0.400	-2.500	-5.125	-11.750	-5.100	-13.250	-2.975	-13.200	-2.700	-8.650
40	-4.781	-8.125	-6.219	-8.875	-10.156	-17.812	-5.531	-13.750	-4.937	-9.000
41	-3.775	-6.050	-5.125	-1.800	-10.600	-15.700	-4.450	-12.100	-4.000	-6.850
42	-3.875	-7.550	-4.125	1.100	-11.500	-16.250	-3.125	-9.650	-3.800	-6.500
43	-1.475	-1.750	-4.400	0.300	-9.775	-15.100	1.300	-1.050	-0.025	-2.900
44	1.075	5.300	-6.825	-3.500	-10.450	-15.350	0.950	0.050	0.300	-1.150
45	2.300	9.400	0.475	0.150	-7.125	-10.800	1.900	2.900	2.650	1.050
46	-0.775	3.200	-1.975	-6.350	-5.000	-8.850	2.600	2.050	3.200	-0.250
47	-6.600	-8.000	-9.450	-13.100	-8.500	-12.500	-3.150	-4.250	-0.250	-4.550
48	-4.725	-5.950	-10.925	-14.050	-6.025	-10.950	-3.500	-4.300	0.175	-5.100
49	-1.062	-5.250	-6.906	-11.375	0.500	-5.312	2.094	-0.062	6.656	0.750
50	-1.656	-6.563	-7.812	-12.437	2.812	-1.813	3.781	2.625	9.031	3.875
51	-3.950	-5.850	-6.350	-11.150	2.350	-0.900	2.300	1.850	7.400	3.000
52	-1.475	-1.150	-0.925	-1.150	6.050	6.700	5.725	8.550	11.725	10.950

Table 39. Daily average revenue in cents per bushel for soybean storage by weeks of the crop year October 1, 1967 to October 1, 1968

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
1	-3.425	-4.100	2.475	3.250	7.725	6.950	10.700	11.100	13.475	12.300
2	-1.225	-3.450	4.325	3.150	7.975	5.750	11.975	9.500	11.475	10.150
3	1.875	1.550	7.675	6.400	10.775	12.400	14.700	12.750	13.725	11.800
4	6.475	7.950	11.725	10.700	13.775	16.700	18.900	16.400	17.050	13.050
5	8.750	8.650	12.075	12.300	12.775	16.450	18.150	16.200	15.750	12.100
6	9.100	7.400	10.700	10.400	12.050	15.050	18.150	14.650	16.375	9.750
7	7.100	5.000	7.850	5.950	9.450	10.850	14.675	11.300	15.000	2.900
8	6.688	7.312	6.969	6.125	8.188	11.250	12.625	11.000	14.625	4.187
9	6.200	7.750	7.400	9.700	7.825	10.550	14.300	10.150	15.875	5.400
10	4.725	5.200	6.650	10.100	6.125	8.440	11.975	6.750	14.450	5.150
11	3.650	2.050	4.825	7.600	4.650	6.000	9.925	3.250	14.100	3.200
12	3.100	4.000	4.000	6.500	4.700	3.800	10.075	1.700	14.125	2.900
13	2.687	6.625	3.844	6.438	6.531	5.036	10.312	-1.062	13.156	2.562
14	4.469	7.875	4.625	7.938	9.406	7.938	11.781	-0.250	13.000	3.438
15	3.475	6.300	3.575	5.200	9.025	4.400	10.675	-0.550	10.750	0.800
16	2.625	2.850	2.300	0.800	8.450	1.600	9.950	-3.050	10.825	-1.250
17	1.175	0.750	0.325	-0.650	7.200	0.850	6.800	-3.450	10.450	0.200
18	0.425	-0.700	1.075	-1.450	6.625	-0.050	8.525	-3.650	9.750	-3.950
19	-0.450	-1.900	0.800	-2.150	6.000	0.000	7.775	-3.450	7.125	-6.950
20	-1.437	-1.750	3.438	-0.812	4.719	-0.125	7.219	-4.875	2.344	-9.500
21	1.187	0.125	5.781	-0.313	5.094	0.500	6.406	-4.125	1.656	-10.000
22	1.725	-0.250	6.725	1.250	6.925	0.300	8.025	-2.250	-[a]	-
23	4.275	1.000	7.425	1.600	7.025	-1.750	11.350	0.000	-	-
24	6.125	0.800	7.650	2.000	6.825	-2.100	12.525	0.250	-	-
25	5.475	2.350	6.475	3.250	6.300	-1.650	9.850	-2.150	-	-
26	4.050	1.800	3.675	2.400	5.525	-6.000	1.175	-6.600	-	-

[a]Sale date after October 1, 1968.

Table 39 (Continued)

Week	Stored 15 days		Stored 30 days		Stored 60 days		Stored 120 days		Stored 150 days	
	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open	Hedged	Open
27	3.275	3.300	1.250	2.750	4.625	-3.800	-1.925	-7.800	-[a]	-
28	2.500	1.833	2.667	0.333	4.458	-4.333	-	-	-	-
29	1.975	2.550	1.400	-0.750	3.975	-2.950	-	-	-	-
30	-0.250	1.450	0.875	-2.550	2.075	-2.750	-	-	-	-
31	1.050	-0.300	0.650	-3.050	4.400	-2.200	-	-	-	-
32	-0.525	-2.750	0.475	-6.800	2.750	-3.550	-	-	-	-
33	-0.350	-3.050	1.650	-6.800	1.425	-4.050	-	-	-	-
34	-0.300	-2.350	1.425	-4.650	0.650	-2.850	-	-	-	-
35	1.312	-3.250	3.063	-1.812	3.719	0.125	-	-	-	-
36	3.100	-3.000	4.200	0.850	6.225	4.500	-	-	-	-
37	2.225	-1.550	4.700	1.250	3.800	0.950	-	-	-	-
38	2.800	2.650	4.950	4.950	1.875	1.450	-	-	-	-
39	1.475	5.450	4.200	5.100	1.975	0.300	-	-	-	-
40	4.156	4.375	1.219	2.500	-1.750	-4.250	-	-	-	-
41	3.175	4.200	1.375	3.550	-	-	-	-	-	-
42	1.100	0.700	0.075	3.900	-	-	-	-	-	-
43	-1.175	-0.200	-1.150	2.350	-	-	-	-	-	-
44	-3.025	0.250	-4.600	-1.750	-	-	-	-	-	-
45	-3.650	3.700	-6.400	-4.400	-	-	-	-	-	-
46	-3.500	1.650	-7.525	-7.400	-	-	-	-	-	-
47	-2.900	-4.450	-	-	-	-	-	-	-	-
48	-8.450	-8.400	-	-	-	-	-	-	-	-
49	-7.063	-8.000	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-
51	-	-	-	-	-	-	-	-	-	-
52	-	-	-	-	-	-	-	-	-	-

Table 40. Weekly average November-May soybean spread

Week	63-64	64-65	65-66	66-67	67-68
1	-0.10875	-0.07325	-0.10500	-0.12575	-0.09425
2	-0.10000	-0.07125	-0.10150	-0.10700	-0.09250
3	-0.10350	-0.08500	-0.09700	-0.08725	-0.09275
4	-0.11025	-0.09025	-0.09275	-0.10225	-0.10475
5	-0.12100	-0.09375	-0.10000	-0.09100	-0.10250
6	-0.11850	-0.08300	-0.09775	-0.05844	-0.11050
7	-0.11300	-[a]	-	-	-
8	-	-	-	-	-
9	-	-0.35625	-0.12750	-0.01900	-0.08425
10	-0.16000	-0.41550	-0.12950	-0.14325	-0.03875
11	-0.23500	-0.39875	-0.12575	-0.11200	-0.04925
12	-0.27850	-0.42563	-0.12469	-0.09350	-0.05375
13	-0.36781	-0.35062	-0.12219	-0.10438	-0.05531
14	-0.32188	-0.34050	-0.16150	-0.09219	-0.05531
15	-0.26100	-0.40775	-0.21625	-0.10200	-0.06675
16	-0.23450	-0.50225	-0.23700	-0.09875	-0.07600
17	-0.20625	-0.54250	-0.22075	-0.10625	-0.08150
18	-0.13625	-0.57675	-0.22150	-0.11333	-0.06100
19	-0.13000	-0.53375	-0.26175	-0.09575	-0.05200
20	-0.10425	-0.46425	-0.25550	-0.09425	-0.05719
21	-0.10844	-0.48906	-0.19781	-0.10344	-0.06 25
22	-0.11325	-0.49875	-0.15325	-0.09300	-0.05625
23	-0.14175	-0.50850	-0.16575	-0.09050	-0.05800
24	-0.13375	-0.41950	-0.16950	-0.07575	-0.05250
25	-0.14300	-0.41050	-0.19525	-0.07969	-0.05350
26	-0.14625	-0.46475	-0.16525	-0.06500	-0.05775
27	-0.13225	-0.47525	-0.14313	-0.06625	-0.05575
28	-0.13650	-0.42562	-0.15300	-0.07150	-0.06500

[a]Contract is not sold during part or all of the week.

Table 40 (Continued)

Week	63-64	64-65	65-66	66-67	67-68
29	-0.15825	-0.42900	-0.15800	-0.07656	-0.07025
30	-0.14425	-0.35550	-0.20425	-0.05425	-0.07675
31	-0.13575	-0.34050	-0.20575	-0.04450	-0.08200
32	-0.12175	-0.34300	-0.23200	-0.06250	-0.08750
33	-0.09475	-[a]	-	-	-0.10375
34	-	-	-	-	-
35	-	-0.09750	-0.07938	-0.05708	-
36	-0.09575	-0.09400	-0.08450	-0.08775	-0.08975
37	-0.09625	-0.09275	-0.09550	-0.08700	-0.08975
38	-0.09700	-0.09525	-0.09025	-0.08800	-0.09125
39	-0.09750	-0.09350	-0.08525	-0.08800	-0.09425
40	-0.09906	-0.09187	-0.08812	-0.09438	-0.10000
41	-0.09750	-0.08600	-0.08700	-0.09500	-0.10025
42	-0.09650	-0.08025	-0.08450	-0.09500	-0.09950
43	-0.09150	-0.07400	-0.09100	-0.09200	-0.09525
44	-0.09600	-0.09775	-0.09265	-0.09375	-0.08450
45	-0.09550	-0.09750	-0.09400	-0.09625	-0.08575
46	-0.09375	-0.09575	-0.09925	-0.09700	-0.09075
47	-0.09025	-0.09675	-0.09900	-0.09175	-0.08725
48	-0.09650	-0.09600	-0.11475	-0.08625	-0.08925
49	-0.09325	-0.09656	-0.13625	-0.08531	-0.09219
50	-0.09187	-0.09750	-0.13600	-0.13600	-0.09100
51	-0.09300	-0.09400	-0.12350	-0.08275	-0.09375
52	-0.08650	-0.09875	-0.17275	-0.08100	-0.08925

Table 41. Five year weekly average November-May soybean spread

Week	Spread[a]	Week	Spread[a]
1	10.140	27	17.453
2	9.445	28	17.032
3	9.400	29	17.841
4	10.005	30	16.700
5	10.165	31	16.170
6	9.364	32	16.935
7	-[b]	33	-[b]
8	-[b]	34	-[b]
9	-[b]	35	-[b]
10	17.740	36	9.035
11	18.415	37	9.225
12	19.521	38	9.235
13	20.006	39	9.170
14	19.428	40	9.469
15	21.075	41	9.315
16	22.970	42	9.115
17	23.145	43	8.875
18	22.177	44	9.293
19	21.465	45	9.380
20	19.509	46	9.530
21	19.200	47	9.300
22	18.290	48	9.655
23	19.290	49	10.071
24	17.020	50	10.059
25	17.639	51	9.740
26	17.980	52	10.565

[a]Given in cents per bushel.

[b]Contract is not traded during all or part of the week.

Table 42. Relationship between weeks and months of each crop year

Month	Week of 1963/1964	Week of 1964/1965	Week of 1965/1966	Week of 1966/1967	Week of 1967/1968
October	1-5	1-4	1-4	1-4	1-4
November	6-9	5-8	5-8	5-8	5-8
December	10-13	9-13	9-13	9-13	9-13
January	14-18	14-17	14-17	14-17	14-17
February	19-22	18-21	18-21	18-21	18-21
March	23-26	22-25	22-25	22-26	22-26
April	27-30	26-30	26-30	27-30	27-30
May	31-35	31-34	31-34	31-34	31-35
June	36-39	35-38	35-38	35-39	36-39
July	40-44	39-43	39-43	40-43	40-43
August	45-48	44-47	44-47	44-47	44-48
September	49-52	48-52	48-52	48-52	49-52