Future trading

COMMODITY FUTURES MARKETS – HEDGING OPPORTUNITIES FOR ONTARIO GRAIN CORN AND SOYBEAN PRODUCERS

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PREFACE

Commodity futures markets provide a number of important economic functions to the agricultural sector. These include the distillation of market information into a mechanism whereby market prices are discovered, the shifting of price risk from farmers and agricultural business entities to speculators, and the facilitation of finance for inventories because of reduced market risk.

Because of these economic functions and because of increasing reliance by farmers on purchased inputs, the use of futures markets have become a topic of increasing importance in Canada in the past few years. This study was undertaken in an effort to provide information to Ontario grain producers on how they might incorporate futures markets into their marketing activities and on how effective using futures markets might be for reducing market risk and increasing producer returns.

The study was conducted under the Ontario Ministry of Agriculture and Food's contract for research in agricultural economics at the University of Guelph.

The author wishes to acknowledge the helpful comments and suggestions of Professors J.H. Clark, T.F. Funk, K.D. Meilke, R.G. Marshall and T.K. Warley as well as a number of students and grain industry personnel on earlier drafts of the paper. Thanks are also due to J.A. Kneeshaw, H.A. Hedley and J.B. Stackhouse for their assistance in compiling and computing the basic data and to Miss Debbie Reid for her perseverance in typing the manuscript and plotting many graphs. The author bears final responsibility for any errors in the manuscript.

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L. J. Martin

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(1.0) INTRODUCTION

The past decade has been a period of dramatically increased production of grain corn and soybeans in Ontario. With the increased production, there has been a corresponding interest in finding improved methods of marketing these crops in order to increase farmers' returns or to reduce their market risk. The latter has become particularly important as producers' use larger amounts of purchased inputs in the production process, thereby becoming less able to absorb losses when market prices turn downward.

One marketing institution in which Ontario producers have displayed considerable interest is the futures market. The futures market provides a mechanism, called hedging, which producers can use to reduce the risk of adverse market price changes.

This paper reports on a study undertaken to evaluate the returns and reductions in risk to Ontario corn and soybean producers who hedge grain using futures contracts. The objective of the report is not to suggest that all cash grain producers should hedge all of their production. Instead it is intended to show how farmers can use the futures market to provide price risk insurance.

The paper has three objectives. These are:

1) to describe the mechanics of futures trading,

2) to discuss the ways that producers can use futures markets in his farm business,

3) to analyze the effectiveness of hedging Ontario grain on the Chicago Board of Trade over the past decade.

Analysis undertaken for objective three was done using data from the past ten years which relate futures price movements in Chicago to cash price movements in Ontario. Ontario cash prices are represented by prices quoted at Chatham. The study is similar in form and intent to others undertaken for alternative commodities and locations. For example see [1], [3], [4].

(2.0) MECHANICS OF FUTURES TRADING[1/]

Futures trading takes place on commodity exchanges. There are several of these in North America, but the most important is the Chicago Board of Trade. The only exchange in Canada is the Winnipeg Grain Exchange. Trading on the Winnipeg exchange, at the time of this writing, includes neither corn nor soybeans. Only barley, rapeseed, flaxseed, oats, and rye are traded at Winnipeg along with live beef futures. Other North American Commodity Exchanges are located at Kansas City, Minneapolis, and New York. The list of commodities traded on futures markets is varied. The following commodities are presently traded in one or more of the North American Exchanges.

Grain: Wheat, corn, oats, barley, grain sorghums, rye.

Oilseeds: Soybeans, rapeseed, flaxseed.

Fats and Oils: Soybean oil, cottonseed oil.

Livestock Feeds: Soybean meal, fish meal, molasses.

[1/] Much of this section is based on other descriptions of futures trading in Hieronymus [3], [4].

Livestock and Product: Cattle, hogs, broilers, pork bellies, feeder cattle, skinned hams, fresh eggs, frozen eggs, boneless beef, turkeys.

Fibers: Cotton, grease wool.

Foods: Potatoes, apples, orange juice, sugar, coffee, cocoa, tomato paste, butter.

Forest Products: Plywood, lumber.

Metals: Silver, platinum, palladium, copper, tin, mercury, gold.

Other: Propane, foreign currency, U.S. silver coins.

(2.1) The Futures Contract

All trading in a commodity is done by use of a futures contract which defines the terms of the transaction. In other words the contract specifies the quantity of the commodity, its quality or grade, its value, the time of delivery or receipt, and the location of delivery or receipt. For example, if a person buys one December corn contract at $1.45, he has committed himself to taking delivery, if he later so elects, of 5,000 bu. of U.S. No. 2 yellow corn at a price of U.S. $1.45, in a public warehouse at Chicago during December. The high degree of specificity in the terms of the contract is necessary to establish uniformity among the lots traded and therefore to allow an individual to establish the value of his particular lot.

Delivery months vary from commodity to commodity. Less than twelve delivery months are established to insure

a high level of market liquidity.[1/] Delivery contracts for corn and soybeans have been established in the following months.

Corn	Soybeans
December	September
March	November
May	January
July	March
September	May
	July
	August

(2.2) Long and Short Positions

Long and short are terms used to describe a trader's position. In simple terms, a long position is used to describe the position of a trader who has bought and is holding a contract. Similarly a person who is holding stored grain is considered to be long. Thus, in our previous example when a person buys a December corn contract, he is long one contract or 5,000 bushels. By the same token, a farmer who has five thousand bushels of corn standing in a field or stored in a bin or country elevator is long 5,000 bushels of cash corn.

A short position is the opposite of a long position. Short means the trader has sold a contract or has sold cash grain. Thus, if a person has sold two November soybean contracts, he is short two November contracts or 10,000 bushels of soybeans for November delivery. Similarly if a country elevator manager sells 10,000 bushels of corn to a distiller for forward delivery, he has a short cash position.

[1/] Hieronymous [4] has explained this point in some detail.

In a futures market, profit or loss is made on the price changes that take place between a trader's decisions to take a long or short position. The simplest example is that of a speculator who, say in July, sees that the price of November soybeans is $2.95. If the speculator feels that the existing price is lower than the actual cash price will be in November, he will go long in November beans (i.e. buy one or more contracts) at $2.95. If he is correct and the November price subsequently increases to $3.05, he can then sell his contract at $3.05 for a gross profit of $.10 per bushel. On the other hand, if his assessment in July is wrong and the November price goes down, he will take a loss because of his decision to go long in November soybeans.

A second fact about long and short positions in a futures market is that for every long there is a short. In other words one person cannot buy a contract unless another person is willing to sell one.

(2.3) Offsetting Contracts and Open Interest

If the sole function of a futures market were to exchange title of grain, there would be no need to be concerned about offsetting contracts. However, since a futures market does have other functions, very few contracts ever mature. In other words, very few people who buy a futures contract intend to accept delivery and very few people who sell contracts intend to make delivery. Normally, less than 5 percent of the total grain futures contracts ever reach maturity.

The reason for this is that most traders close their position by offsetting contracts. Let us return to our soybean speculator above to understand how this is accomplished. The speculator, because he felt the November price was too low, bought a November contract at $2.95 in July and sold back a November contract at $3.05 later, say

in September for a profit of $.10 per bu. By first buying and then selling, his net position is zero. So there is no reason for the trader to make or take delivery in November. By trading offsetting contracts, the speculator has closed his interest in the market.

At a given point in time there will be a large number of futures traders who have not offset their futures positions -- in other words they have an open interest in the market. Thus, open interest is a measure of the total number of un-offset long contracts held by a trader, or all traders, in the market at a point in time.

(2.4) The Broker or Futures Commission Agent

All actual trading is done in pits on the floor of the commodity exchange. The number of people who participate in floor trading is limited to those having membership in the exchange. The number of members is also limited so that the average person who wants to trade in the futures market must do so through a futures commission merchant who has or has access to a seat on the exchange.

The commission merchant serves, in the first instance, as the trader's agent. A person who wants to trade futures contracts, say a farmer or country elevator operator, must go to the commission agent in order to initiate trading.

Many commission merchants also provide additional services, either in conjunction with the trading of accounts or on a subscription basis. These include; commodity analysis, account supervision and holding of margin deposits, and the provision of market information and advice to traders.

(2.5) Margin Requirements

Futures contracts are traded on margin deposits

which constitute a fairly small percentage (usually from 5 to 20 percent) of the total value of a contract. There are two parts to the margin requirement. These are called the initial requirement and the maintenance margin. The initial requirement is the minimum amount that the brokerage house is required by law to collect from a customer and deposit with the Exchange Clearing House to guarantee performance on the contract. The Clearing House keeps accounts for all member and non-member traders. All contracts pass through the Clearing House because it acts as a buyer to all sellers and a seller to all buyers. The broker also requires a maintenance margin which is generally 2/3 to 4/5 of the initial margin. The maintenance margin is the broker's insurance that the customer's margin will not fall below the minimum requirement. The broker can ask for additional maintenance margin any time the customer's position is threatened. However, he must require additional maintenance margin when the total margin is depleted below the minimum or initial requirement. If the customer does not deposit additional margin within a reasonable time, the broker is required by law to close out the customer's position in an amount sufficient to bring the margin deposit up to the minimum margin. This protects all traders in the market and ensures that contracts will be fulfilled either in physical commodity or an equivalent cash settlement.

When a position is closed, the margin deposit plus or minus the profits or losses on the trade are available to the customer. Profits showing on an open position may also be withdrawn if the customer wishes.

Let us illustrate how the margin works in an actual trade by citing an example using hypothetical margin requirements for soybeans.[1/] Assume that the margin

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1/ The margin requirements used in this example were those actually required in the early fall of 1972.

requirements are 12 cents per bushel for the initial requirement and 8 cents for the maintenance margin. This means that the initial margin deposit for a contract would be $600 with maintenance at $400. Assume that a customer buys a July contract at $3.74. Suppose, now, that the price drops to $3.70. There has been a four cent loss ($200) and the amount of the maintenance margin available to cover further losses is now only half as much as originally. If prices drop further, to $3.66, the customer has lost 8 cents per bushel or $400. At this point, the maintenance margin has been completely depleted and the customer would be required to deposit additional margin if he plans to maintain his long position. In this way the Clearing House, through the broker, always maintains at least 12 cents per bushel to guarantee performance on the contract.

(2.6) Commissions

It should be clearly understood that the margin requirement is not a commission. The margin deposit is only a guarantee of the trader's willingness to pay in case he loses money on the trade. If he trades an offsetting contract and closes his account, he will receive back his margin deposit plus or minus the profit or loss he takes on the trade.

However, commission agents do not perform these services free of charge. They charge a commission. The commission is charged on a round turn - i.e. offsetting contact-basis. The commissions for round turn corn and soybean transactions at the time of this writing are both $30.

(2.7) Types of Orders

When a customer goes to his commission agent to place an order, there are several alternative types of

orders for him to choose from. The simplest is a market order which instructs the broker to buy or sell immediately at the most advantageous price. The broker attempts to carry out the order at the most recently traded price. If no one is willing to trade at that price, the broker will bid a higher price if it is a buy order or offer a lower price if it is a sell order. Thus, the actual contract price may be slightly different than the current market price at the time the customer placed the order. An example may be illuminating here. Let us suppose that a man in Southwestern Ontario calls his broker at 10:15 a.m. and places a market order to buy one January soybean contract. The trading price on the floor of the exchange at that moment may be $3.61. Let us further suppose that the broker gets the order to his company's trader on the Exchange floor by 10:18. In the three minutes that have elapsed it may be necessary for the trader to raise the bid to buy the contract to $3.61 5/8 in order to induce someone else to sell a contract. Thus, the actual price of the contract is slightly higher than the price at the moment the order was made.

A second type of order is the limit order. In this case the customer recognizes that prices change very quickly and he wants to limit the price difference from the current trading price over which he is willing to trade. This can be illustrated by pursuing the above example. Let us assume that the customer is willing to buy a contract at $3.61 but not at $3.61 5/8. He therefore, might place a limit order to buy at $3.61 1/2 or less. In this case the order may or may not be filled.

A third type of order is the stop loss. In this case the customer is attempting to limit a possible loss or to protect an existing profit. It is used, if the customer has previously bought, to tell the broker to sell if the price goes below a certain price or, if he has previously sold, to buy if the price goes above a certain level. Again

pursuing our soybean example, we can illustrate how the stop loss can be used. Let us assume that the customer bought at $3.61 and the market subsequently begins to decline. For each point - i.e. each cent - decline in price the customer is losing one cent per bushel or $50 per contract. Now, let us assume that he is willing to risk a decline of five cents or $250 in hopes that the market will turn around and go back up, but he is not willing to risk more than $250. In other words, he would rather limit his possible loss to $250 and leave the market. In this case, he would put a stop loss order with his broker which, in effect, tells the broker to sell if the price reaches $356.

A slightly different example will illustrate how the stop loss can be used to protect an existing profit. Let us again assume that the customer originally bought at $3.61, but now he happily observes that the market has risen to $3.67, a six cent increase, or a potential profit of $300. Obviously, the customer would prefer to remain in the market if the price continues to rise, but if it starts to decline, he would prefer to protect at least part of his profit. He may decide to risk a one cent decline from $3.67 but no more than one cent. Thus, he can place a stop loss order with his broker to sell back his contract at $3.66, and a profit of $250 is assured.

There are other, more complex types of orders which a customer can place, but those cited above are sufficient to show that a person can make any order that the commission agent can understand and execute.

(2.8) Initiating Contracts - an Addendum

Now that we have discussed the mechanics of futures trading, it may be helpful to address a question which often arises when people investigate the futures market for the first time. The question is, who can initiate a futures

contract? Or more precisely, how can a grain futures contract be initiated by a person who never really intends to deliver or accept delivery of any volume of the grain? The answer lies in the concept of offsetting contracts. Let us suppose, for instance, that we have two potential soybean speculators - one a taxi driver in Toronto, the other a doctor in London. Obviously these two people probably have no interest in ever seeing a bushel of soybeans. However, they both may have a few hundred dollars (enough to cover the margin requirements) which they would like to risk in the futures market because they feel that they can forecast future movements in soybean prices. Assume that on July 12 both observe that January soybeans are trading for $3.45. The taxi driver may have information which makes him believe that the $3.45 price is too high, so he places an order with his Toronto broker to sell January beans. Likewise, the London doctor has information which makes him believe that the current price is too low, so he places an order with his London broker to buy January beans. For the sake of simplicity, let us further assume that the doctor buys the taxi driver's contract. Perhaps a week later on July 19 the trading price for January soybeans has fallen to $3.35 - in other words, the taxi driver was right and the doctor was wrong! The taxi driver is now satisfied with his profit and decides to buy back his contract for a profit of $500 (minus the $30 commission fee) and the doctor (unhappily) decides that he should accept his loss, so he places an order to sell back his contract and live with his loss of $500 (plus the $30 commission fee). Again, it so happens that the doctor sells his contract to the taxi driver. Since both traders have offset their contracts, neither has any open interest. In other words, a contract for 5,000 bushels of soybeans has been bought and sold by two people with no soybeans actually trading hands. In principal, all January contracts traded could be handled in a similar way so that no soybeans are ever delivered. Thus, it is not nccessary that traders have an interest in the commodity being traded. All that is necessary is that they have a small amount of risk capital

available and that they have an interest in forecasting future prices.

This example also illustrates another very important aspect of futures trading. That is, for every profit made on a futures contract a loss of identical magnitude is taken. Thus, futures trading in the aggregate is a zero sum game - i.e. there are no net profits and no net losses (except for the loss of commission fees).

(3.0) WHO TRADES FUTURES CONTRACTS?

People who trade futures contracts can be categorized into two groups - speculators and hedgers. Speculators are people who are willing to risk capital on changes in market prices. They buy contracts in hopes that the price will go up, or sell them in hopes that the price will go down.

Speculators come from all walks of life. The only prerequisite necessary for becoming a speculator is the possession of a small amount of capital and enough nerve to risk it on the futures market.

It is interesting to compare a futures market speculator with a man who owns cash grain with the expectation that cash prices will go up in the future. Let us assume that a speculator has purchased two contracts (i.e. 10,000 bu.) of July beans in hopes that the July price will rise. Now, let us assume that a farmer has 10,000 bu. of beans in storage. He is hoping that the cash price will increase. Clearly, the two positions are exactly the same. The man holding beans is speculating as surely as a man holding futures contracts.

Our discussion in this and the preceding sections has avoided the central focus of this paper - namely how

grain producers, and grain middlemen can harness the futures market by, in fact, making use of futures speculators to shift price risk from themselves to speculators. Farmers and businessmen who utilize this mechanism fall into the second group of futures traders who trade with the objective of hedging. The remainder of the paper will turn to this important question.

A hedge can be characterised in the following manner. If a producer has a cash position in a grain and he wants to protect an existing price, he can hedge by taking a futures position which is equal and opposite to his cash position. Let us illustrate the concept with a very simple example of a farmer who has 5,000 bu. of corn in storage on January 7 when the cash price is $1.40 and the July futures price is $1.27. The farmer decides that he wants to store his corn for sale on June 23, but he would like to avoid the risk of a market price decline between January and June - i.e. he wants to protect the existing price of $1.40. He can do this by taking an equal and opposite position in the futures market - i.e. he sells (goes short) one contract of July corn at the current futures price of $1.27. His cash and futures positions on January 7 are, therefore, as follows:[1/]

Date	Cash Position	Futures Position
January 7	long 5,000 bu. of corn Cash price $1.40	short 1 contract of July corn July futures price $1.27

In other words he has a position in the futures market which is equal but opposite to that in the cash market and he wants to protect the price of $1.40.

[1/] This example is purely hypothetical and is merely being used to illustrate the concept of hedging.

Now on June 23 the farmer would like to sell his corn, but he finds that the cash price has dropped to $1.30. He may feel that the cash price will continue to fall, so he decides to sell his corn. When he sells the cash corn, he simultaneously buys a July contract to complete the hedge. Assuming that the July futures price has fallen to $1.17, his position on June 25 is therefore:

Date	Cash Position	Futures Position
June 25	short 5,000 bu. of corn Cash price $1.30	short 1 contract of July corn July futures price $1.17

By selling his corn and buying back the futures contract he has closed out both his cash and futures positions by again making equal but opposite transactions. Furthermore, he has locked in the January price of $1.40 since, even though his cash corn price is now ten cents less, he has made a profit of $.10 per bushel (less the $30 commission fee) on his futures transactions. Thus he has accomplished his objective of avoiding a price decline by hedging.

This is an example of a, so-called, perfect hedge because the gain on futures just offset the loss on cash grain. However, in reality it is considerably less than perfect since it did not insure the grain producer a return to his costs of storage from January to June. In fact, this kind of example rarely takes place in the market -- and because it doesn't, the hedger has a chance of not only assuring himself of a price for his hedged grain, but also to assure himself of a return to his storage activity. This assurance can be obtained through the relationship over time between cash and futures prices -- a relationship known as the basis. As we shall see below, the basis is predictable within a range of prices and certainly more predictable than cash prices. It is the

predictability of basis which allows hedging to be used as insurance against price risk.

This example does, in fact, illustrate how the futures contract can be used to reduce the producer's price risk. In most cases, when a hedger trades a contract, it is traded to a speculator who, as we saw earlier, is risking capital on a price change. The hedger, since he has a long position in one market and a short position in the other can profit in one or the other if prices change. His only risk is in the movement of cash price in relation to futures price. Thus, at least a portion of the price risk is shifted from the hedger to the speculator.

(4.0) THE CONCEPT OF BASIS

Understanding and forecasting basis is necessary for successful hedging. Basis fundamentally is a measure of the relationship between cash and the near or dominant futures price at the delivery point at a given time. If we say the March corn basis at Chicago is 3 under, we mean that the Chicago cash price is three cents lower than the March futures price.

Basis can also be calculated for alternative points in space and time - i.e. for alternative market centres and for alternative delivery months. Basis can, therefore, be defined as the difference between cash price on a given day at a specific point and the futures price at Chicago on the same day for a given delivery month.

For example, if the cash price of soybeans on December 1 at Chatham is $3.31, the January futures price on that date, is $3.37, and the March futures price the same date is $3.40, then the December 1 basis at Chatham is six under January and nine under March.

Based on the example above, we can see that there are essentially two elements of basis - i.e. basis over time, which refers to changes in the absolute level of basis over time from one harvest period to the next, and basis over space which refers to the expected price relationship between spatially separated markets. It is the simultaneous understanding of these two relationships which are necessary for successful hedging. They are discussed below.

(4.1) Cash-Futures Price Relations - Basis Over Time

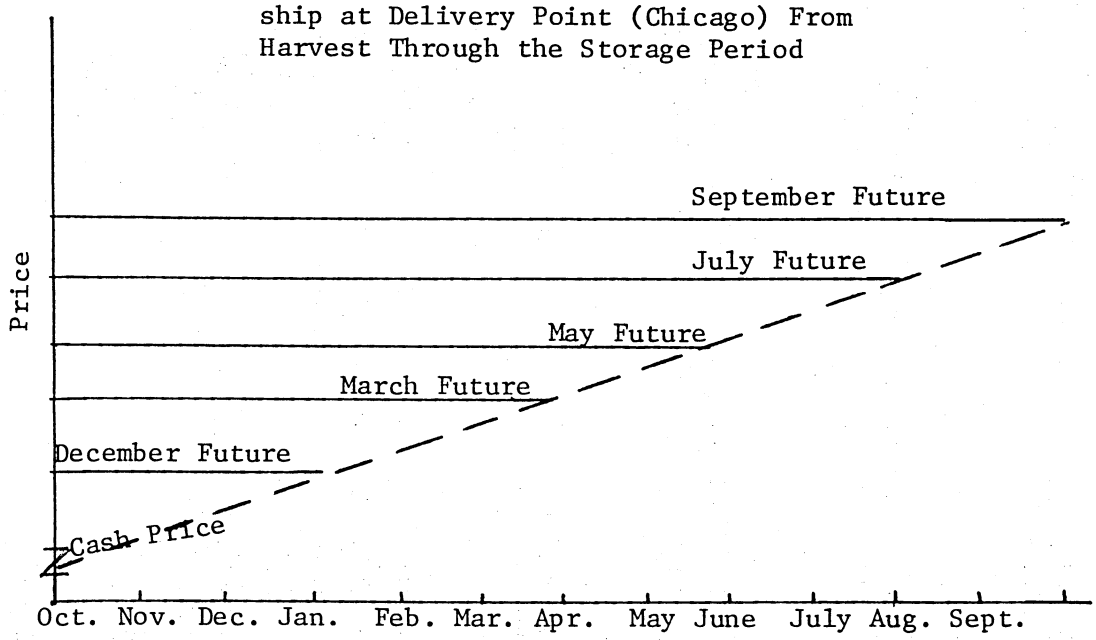
If we were to look only at cash-futures prices at the delivery point - i.e. Chicago - we would expect that on the last day of trading for a given delivery month, the cash price of the commodity would very nearly equal the price of that contract. Until the end of the delivery month, the Chicago cash price would be expected to be less than the futures price. The reason for this is referred to as the theory of the carrying charge. The theory of the carrying charge refers to the difference over time in the charges for carrying (holding) stored grain and the charges for carrying a futures contract. For a futures contract, the carrying charge is simply the interest on margin requirement. Carrying charges for stored grain can consist of depreciation, insurance, interest, taxes, repair and maintenance costs, perhaps commercial storage charges, and risk of product deterioration. In short, carrying charges for stored grain are all the costs of storing grain from one point in time to another.

Clearly, over a period of several months, carrying charges for stored grain will be greater than carrying charges for futures contracts - and, therefore,(according to the theory of the carrying charge) the price of grain at the delivery point would be expected to be less than the trading price of a given futures delivery month by the amount of storage costs until the delivery month. In other words,

the cash price of corn in January should be less than the January price of July futures by the cost of storing corn from January to July.[1/] This relationship also holds for other points in time and other delivery months.

Given the carrying charge concept, we can represent the expected basis relationship over time from harvest through the storage period at delivery point schematically as in Figure 1. Figure 1 illustrates that if futures prices remained constant, then the Chicago basis would narrow - i.e. the cash price would rise in relation to the futures price as time moves toward contract maturity.

Figure 1--Expected Cash and Futures Price Relationship at Delivery Point (Chicago) From Harvest Through the Storage Period



1/ Hieronymus [3] has shown that this relationship holds by charting Chicago cash and futures prices over a period of seven years. Actual storage costs vary from year to year as a function of the supply and demand of grains and the supply and demand of storage.

The difference between cash and a given futures delivery price, at a point in time, is the cost of storing corn from that time until the close of trading for the delivery month. In other words the May basis is greater in January than in April because it costs more to store from January to May than it does to store from April to May.

(4.2) Actual Chicago Basis Pattern

To illustrate how Chicago basis actually changes over time, crop year 1968 soybean cash and futures prices are presented in Appendix Table 1 and charted in Figure 2.

Appendix Table 1 bears out the theoretical relationship depicted in Figure 1. At harvest time cash price was substantially under all futures delivery months. The range was from a minimum of 4 1/2 cents under January on October 30 to a maximum of 17 3/4 cents under July on November 7. After harvest the basis for all months gradually narrowed until cash and futures prices equated a few weeks before contract maturity and then became inverted for the final few days of trading. Cash equated with January futures in mid-December, with March in mid-February, with May in early April, and with July about the first of May. Cash prices normally close higher than futures for the last few days of trading for a number of reasons. These include the relationship of grain on track with grain in warehouses. (1968 was somewhat unique in that cash price was higher than futures for several weeks).

Figure 2A indicates graphically how cash and May futures moved from October 3 to May 15. Figure 2B indicates how the May basis changed over the same period. Figure 2B is simply the level of basis, as defined earlier - i.e. cash price minus May futures - each week during the period

Figure 2A--1968 Cash and May Futures Prices for Soybeans at Chicago

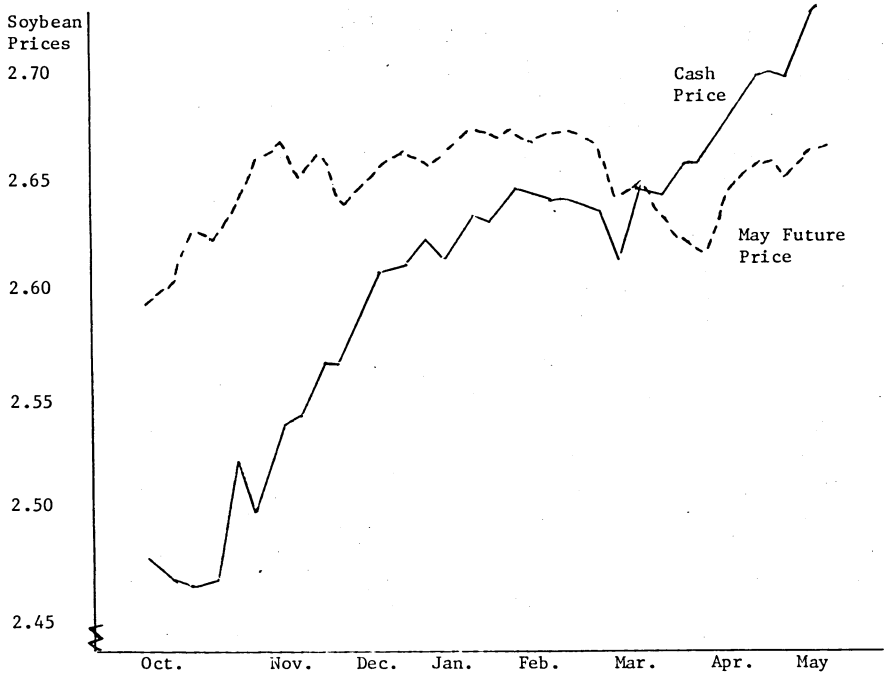
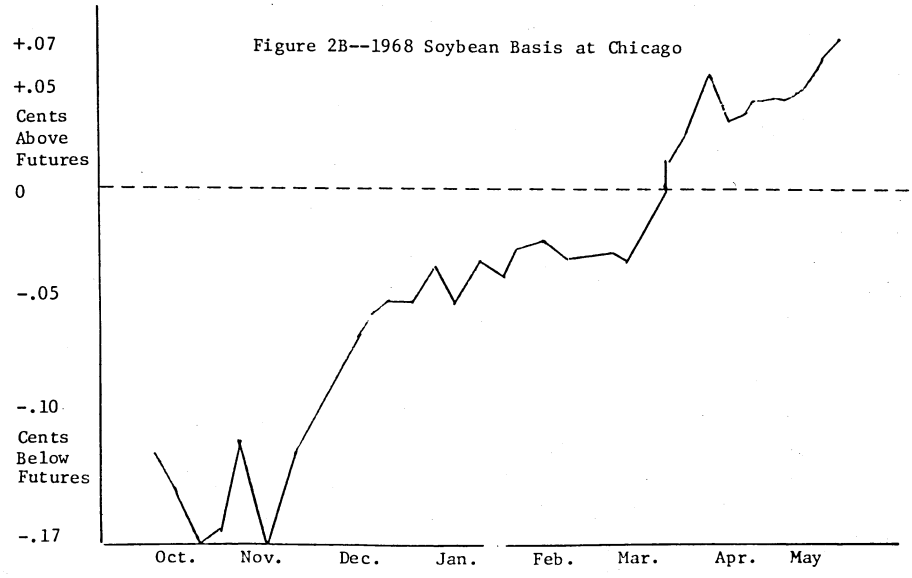


Figure 2B--1968 Soybean Basis at Chicago



(4.3) Price Relationships Over Space and Basis in Space

The second element of basis is the relationship of prices over space. The expected relationship between spatially separated markets refers to the law of one price, which states that cash price at two points will be different by the transfer cost between the two markets. If prices differ by more than transfer costs in a competitive market merchant middlemen will be able to profit by buying in one market and selling in the other. Buying and selling, which is called arbitrage, would continue until prices are bid up in the low price market or forced down in the high price market to the point where they are again different by the cost of transportation. When this difference is reached, it is no longer profitable to buy and sell and trade stops. Another way to view this relationship is to say that when prices differ by more than transfer costs, the price differential is a signal to middlemen that a local shortage or surplus exists and that there is a need to even out supplies between markets.

A second factor concerning spatial price differences is the relationship between surplus regions and deficit regions. In the case of two isolated regions, one a surplus region and the other a deficit region, prices in the deficit region are usually higher (by approximately the transfer costs) than those in the surplus region. If the deficit region price is greater by more than transportation costs, arbitrage will take place to cause trade between the two regions until prices again differ only by transfer charges. For example, if Kent county is a surplus corn producing area and Huron is a deficit area, Kent will tend to ship corn to Huron until prices differ by the transfer cost between the two. Clearly, at equilibrium, the Huron price will be higher than the Kent price. If livestock producers in Huron need more corn for feeding, they will bid prices up such that the differential is greater than transportation costs. This will induce middlemen to buy in Kent and sell in Huron until prices are forced back to

equilibrium.

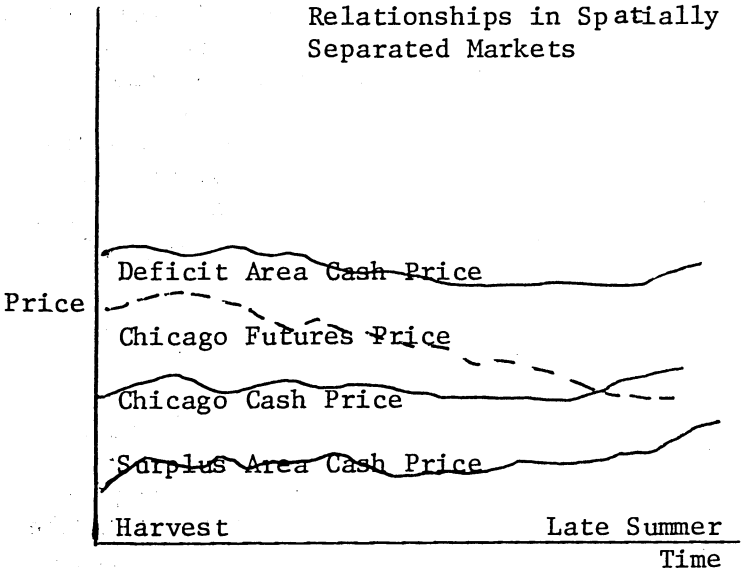
A third factor which affects the spatial nature of prices is the existence of multiple destinations from the surplus area. This can be illustrated by dropping the implied assumption in the example above that Huron is the only destination for Kent corn. In reality, Kent county ships corn all over Ontario and into Quebec. In this case, price differentials at a point in time are based on the best (highest price) market for Kent corn at the time. Thus, if Huron is the best market, Kent prices will tend to be less than Huron prices by transportation costs between the two counties, while if Montreal is the best market, Kent prices will tend to be under Montreal prices by the transport cost to Montreal. In the latter case, Kent-Huron prices could differ by less than transport costs.

The conclusion of this discussion is that, while the exact margin between prices at two geographically separated points may vary from time to time, prices do vary with a high degree of correlation since arbitrage is continually taking place between all points. Thus if Montreal prices are rising, so will Kent and Huron prices. Similarly, prices in Ontario are related to prices in the U.S. by the same mechanism with the additional considerations of tariff and currency exchange rates between the two countries.

We can relate the above discussion to the concept of basis over space. If cash grain prices tend to be rising in Chicago, they will also be rising in Ontario - or any other point. As a generalization, the actual level of prices at a given point will depend on whether that point is located in a surplus or deficit area. If the point is in a deficit area, say for example the South-eastern U.S., prices will tend to be higher than Chicago prices by the cost of shipping from Chicago to the South-east. If the point is in a surplus area, say for example Eastern Iowa, Iowa prices will tend to be lower than Chicago

prices by the cost of shipping from Iowa to Chicago. This expected relationship is shown graphically in Figure 3 for a year when prices are declining. Clearly, this means that while cash prices vary in concert spatially, the basis

Figure 3--Expected Cash and Futures Price Relationships in Spatially Separated Markets



between cash and futures prices varies at different points. However, since, as was shown above, basis narrows over the storage period at Chicago, and since cash prices tend to move together, a generalization can be made about the cash -futures price relationship at all points. Cash prices rise in relation to futures price during the post-harvest season. In other words, basis at a surplus point will tend to be under futures price by the cost of storage until contract maturity, plus the cost of transportation from the surplus point to Chicago. Cash price at a deficit point will tend to be above futures price by the cost of transportation from Chicago to the deficit point minus the cost of storage to contract maturity.

It is this known basis pattern plus the predictability of basis at a given point which allows, as will be shown below, the successful use of hedging.

(4.4) Corn Basis Patterns in Southwestern Ontario

Corn basis patterns for Southwestern Ontario are presented below in Figures 4 through 7 for the July futures contracts. These graphs are slightly different than the one represented in Figure 3 with actual cash and futures prices since they show only the basis above or below futures price. Thus, in Figure 4, the July 1962 basis on December 13 was six cents above. In all cases basis patterns are for Chatham and are computed in terms of Canadian dollars - i.e. the Chicago price has been adjusted to Canadian units by the weekly currency exchange rate. All prices from which Figures 4 through 7 were derived as well as prices for the December futures are contained in Appendix Table 2.

Figure 4 indicates that Chatham basis generally followed the expected behaviour for the 1962 and 1963 crops although the 1962 pattern was somewhat erratic. In both cases, harvest basis was slightly above future price. Basis then increased through the fall and, in both years, experienced a fairly substantial increase around the first of January. From January to approximately the first of May, basis stayed fairly constant for both years, and then increased substantially until the end of July trading. From 1964 through 1968, the corn basis followed a similar pattern with obvious year to year and month to month variations. One trend that developed over these years was a gradual over-all diminution of basis as time passed - i.e. Ontario cash prices fell slightly in relation to futures price over the ten year period. This conclusion is amplified by examining basis patterns in Figures 6 and 7 for the 1969 to 1971 crops. In 1969, Ontario harvest price was substantially below futures price at harvest and

TABLE 4

Weekly July Basis for Corn at Chatham - 1962, 1963 and 1964 Crop

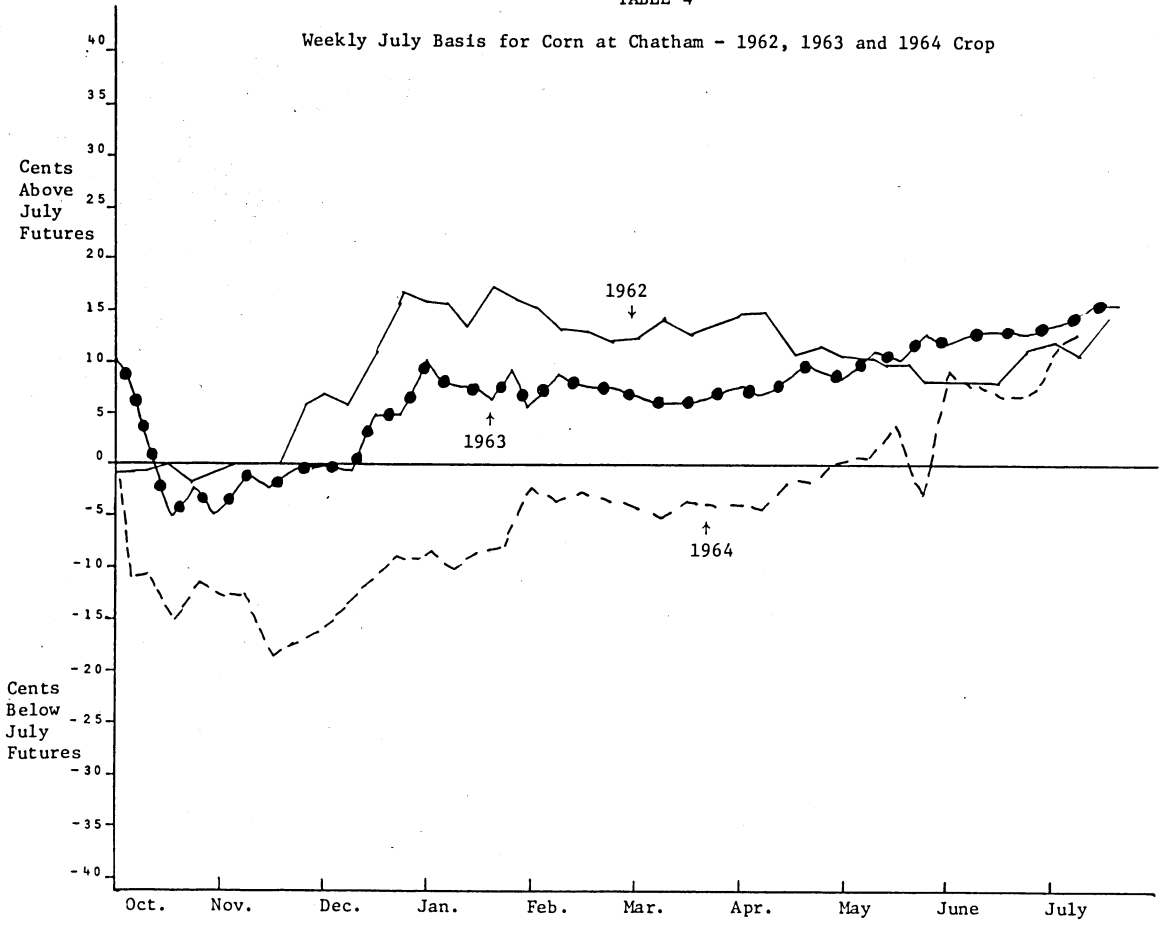


FIGURE 5

Weekly July Basis for Corn at Chatham - 1965, 1966 and 1967

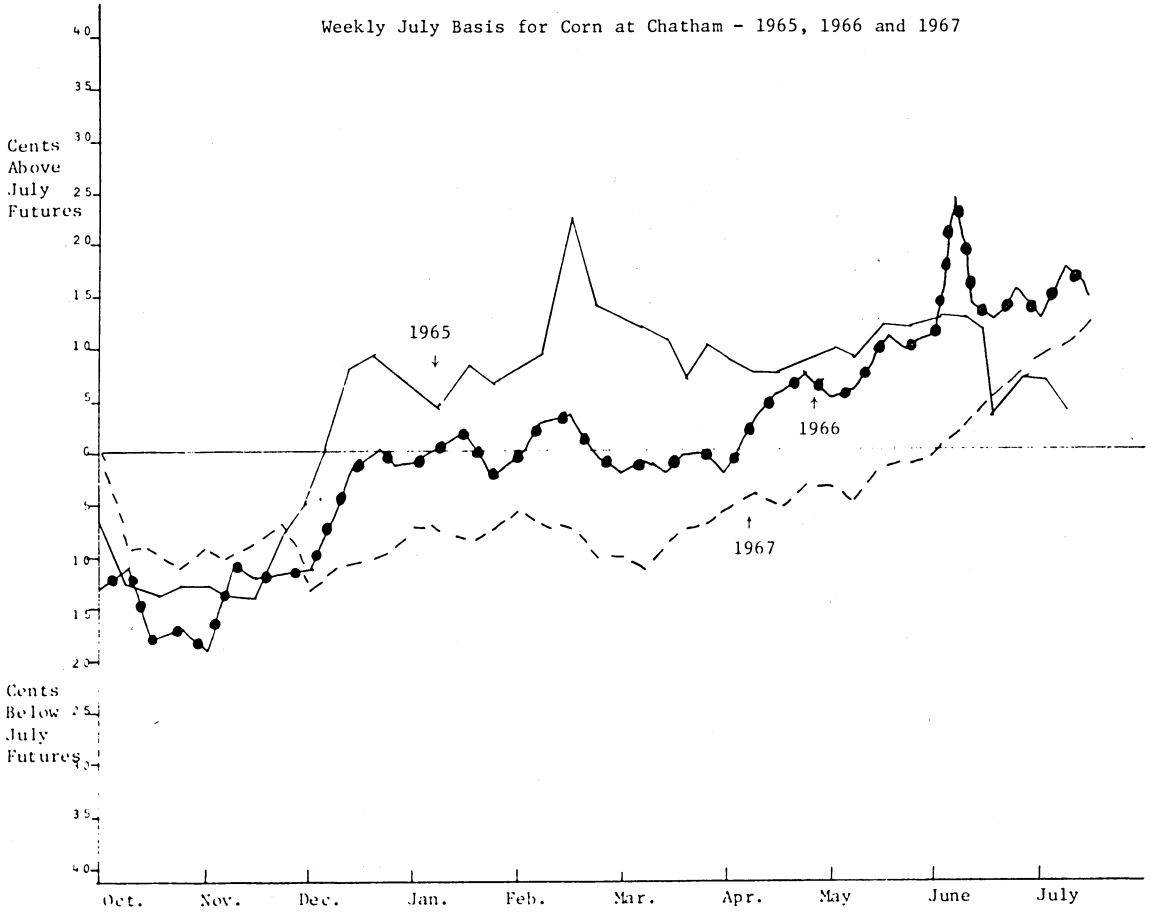


FIGURE 6

Weekly July Basis for Corn at Chatham - 1968, 1969 and 1970 Crop

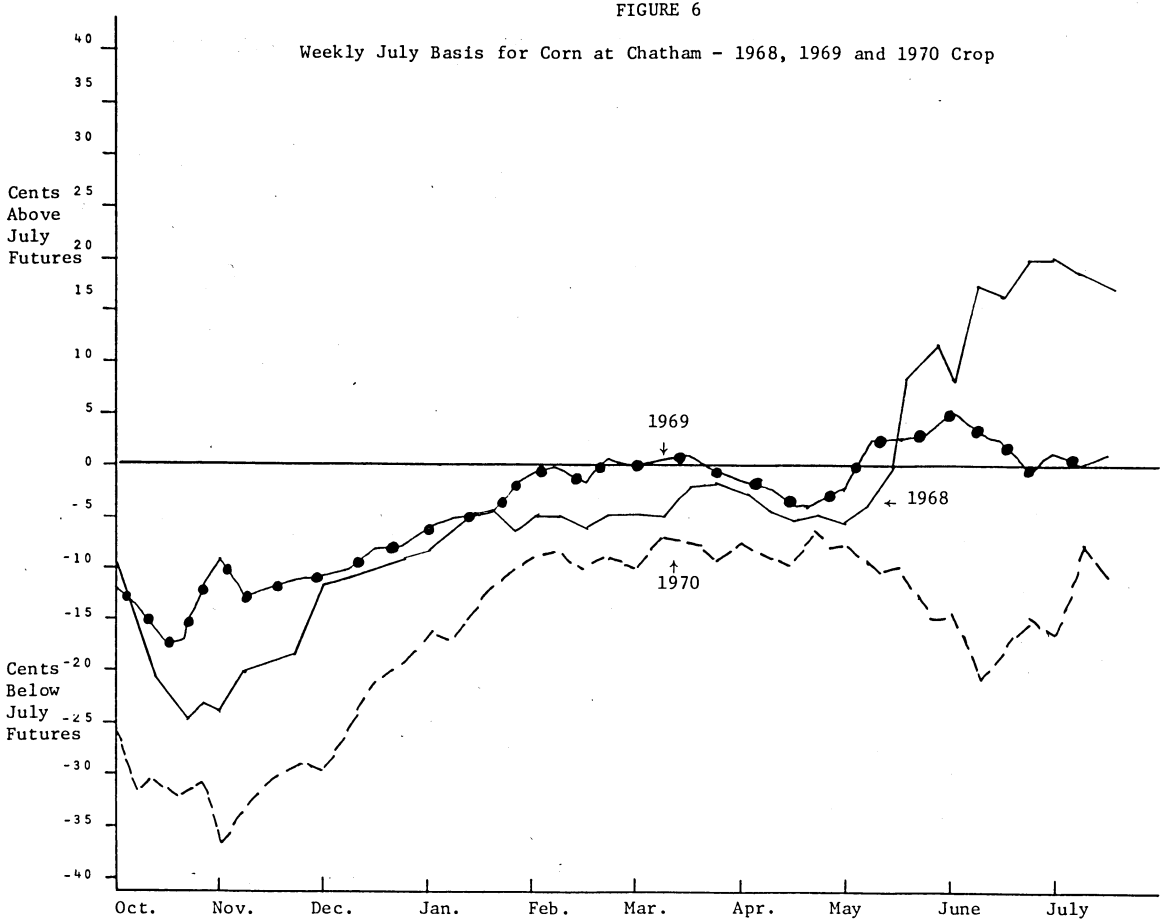
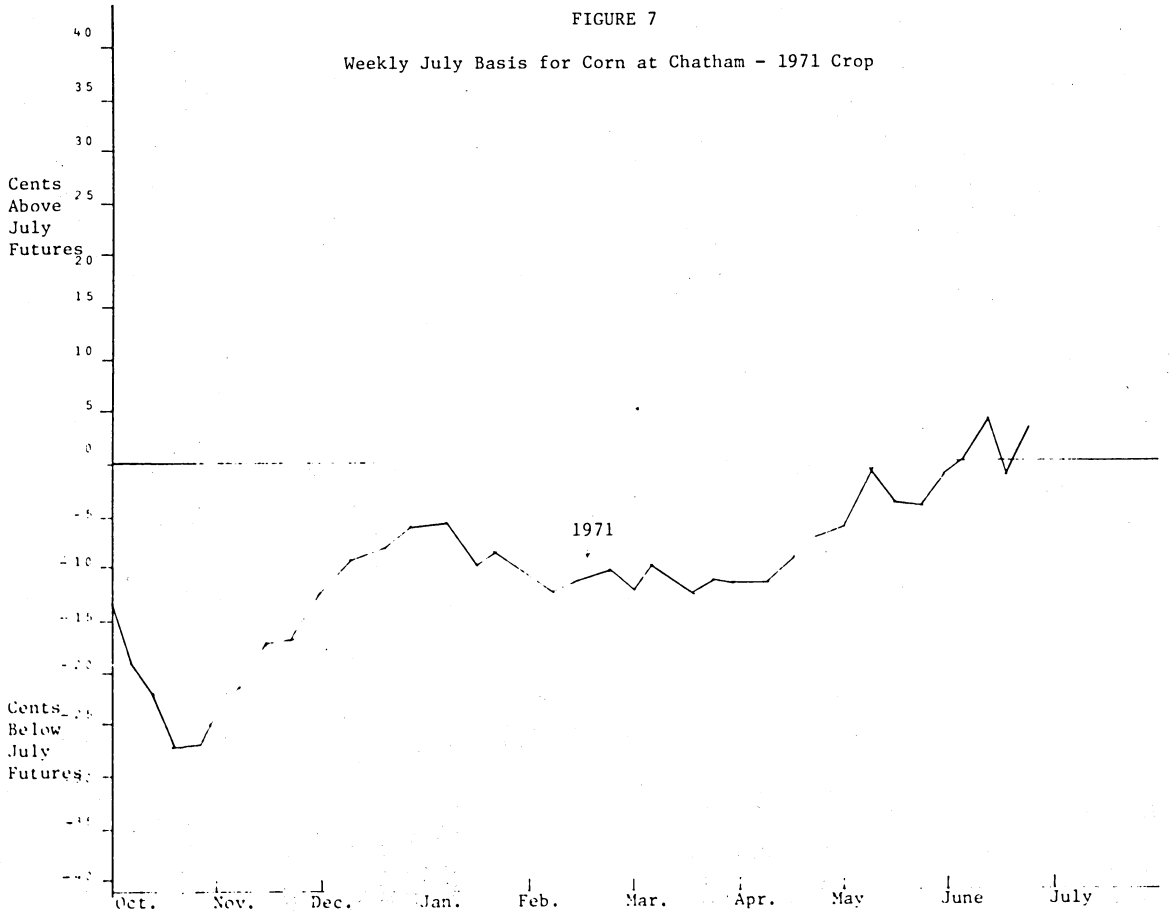


FIGURE 7

Weekly July Basis for Corn at Chatham - 1971 Crop



then moved very close to futures during late winter and early summer before closing slightly higher than futures prices in late summer. In 1970 and 1971, however, Chatham cash prices remained under the July future for most of the year. Thus, it is possible to make the following generalizations about the Chatham corn basis. First, Chatham basis has tended to exhibit behaviour consistent with basis theory - i.e. cash prices have risen in relation to futures after harvest. Second, while the general behaviour is consistent, there are considerable year to year fluctuations. These are in part a function of supply of and demand for storage relative to supply and demand for corn, but also related to a trend toward relatively lower Chatham cash prices. A further view of the latter can be seen by examining basis for a specific date. These are presented below for the July basis at the beginning of each June.

June 1963	7.9¢	June 1968	0.4
1964	12.1	1969	8.3
1965	9.0	1970	5.0
1966	13.2	1971	-15.0
1967	10.7	1972	-1.0

These figures indicate that Chatham cash price was substantially higher than futures for all crop years from 1962 through 1967 and then dropped off to small positive or substantial negative bases. They also indicate that a general downward trend in basis has occurred over the period.

This change in basis pattern is a very interesting development, and, as we shall see below, it has important implications for hedging opportunities in Ontario. It may be useful to attempt to understand why it has occurred. There are probably two major factors which have brought it about. First, the fact that Ontario has substantially increased its corn production over the period being analyzed would have an important effect. Grain corn production increased from 33.3 million in 1962 to 102.2 million bu. in

1970 [8]. This indicates that the supply function for Ontario corn has shifted and the Province is approaching a self sufficiency level of production. This is in line with the discussion of price relationships between surplus and deficit areas presented in section 4.3. Specific examples can illustrate this effect. Ontario cash prices for the 1962 and 1963 crops were substantially above futures prices. Production in these two years was 33.3 and 36.0 million bushels respectively. 1964 production increased to 59.3 million bushels or about 40 percent above 1963 production. Concurrently, the cash prices were closer to futures prices for the 1964 crop which reflected the strain on marketing facilities used by the increased production. Small production increases occurred again in 1965 and 1966, but basis recovered to near the levels of 1962 and 1963 which was probably due, in part, to adjustments of marketing infra-structure. Then in 1967 and 1968 substantial increases in production (by about 7.5 and 7.3 million bushels respectively) occurred and again, basis generally narrowed for the two years.

The second, and perhaps more important, factor affecting the Chatham basis is pricing policies for Western Canada feedgrains by the Canadian Wheat Board. Until 1969, Western feedgrains, particularly barley, were priced at a level which made them marginally competitive with U.S. and Ontario corn. Since 1969, Western feedgrains have, at times, been priced well below corn in an effort to increase sales in Eastern Canada. Thus, the lower Western feedgrain prices could be responsible for maintaining the relatively lower price of Ontario corn. The best example of this can be seen in the 1969 basis when, despite a substantial decrease in the 1969 corn crop (from 78.5 million bushels in 1968 to only 69.8 million bushels in 1969), Chatham corn price failed to return to its previous level above futures prices. In fact the basis pattern in 1969 was actually lower than in 1968 (see Figure 6). Since 1969, basis patterns have changed to a point where cash prices were actually below futures prices during most of the year.

However, corn production increased significantly in both years, so that it is not possible to pinpoint the effects of the two factors on basis. However, one thing is clear. There has apparently been a structural change in the market for Ontario corn as a result of Canadian Wheat Board policies (although this may not be a long term adjustment) and Ontario corn production. This has altered the Chatham cash corn prices from a pattern normally above futures prices to a pattern somewhat below futures prices.

It may be useful at this point to examine, in addition to basis, some properties of absolute price relationships. These are shown in Appendix Table 2. There are three characteristics of some importance for our analysis. First, futures prices and cash prices generally move in the same direction. If cash prices are increasing, futures prices are also increasing, although some unrelated fluctuations do occur. Also, while general trends move together, cash prices normally fluctuate more than futures - an observation which is consistent with basis theory.

Second, cash price generally increases from harvest to late summer. This is particularly true in Ontario over the past decade because of the constant increases in corn production which have put a strain on storage facilities in the Province at harvest time and forced down harvest prices. It should be noted from the Appendix, however, that while this is generally true, in at least three years, cash prices in early to mid summer were lower than prices at the previous harvest.

Third, cash prices at harvest were almost always lower than prices in the preceding spring and summer. This generalization is true for the same reason - i.e. the large increases in corn in the distribution system at harvest time relative to available storage facilities. These price declines are what the futures market allows producers to hedge against.

(4.5) Basis Patterns for Soybeans in Southern Ontario

Basis patterns for soybeans in relation to July futures are presented in Figures 8 to 11 for the 1962 through 1971 crops. As in the case of corn, futures prices were adjusted to Canadian dollars before each year's basis pattern was calculated.

In general, the soybean basis pattern conformed very closely to that expected from basis theory over the ten year period, although there was considerable year to year variation.

In each year, Ontario price was below futures price by a substantial margin in the harvest period from early October to early November. Basis then tended to remain below or rise slightly through the winter and rise substantially in the spring and early summer.

There seems to have been little marked change in the basis pattern for soybeans in Ontario during the period. Only two trends of any significance appear over the period. First, Ontario cash prices seem to have fallen slightly in relation to futures prices. This trend appears to have been strongest during the 1966 to 1969 crop years but somewhat diminished for the 1970 and 1971 crops. The second, and more important trend is that harvest cash prices were farther under futures prices in the later years of the period. This, in part, is caused by the fact that harvest storage was increasingly scarce, and expensive, in the later years because of increases in corn production. Perhaps more important is the fact that Ontario produces only a fraction of the soybeans it uses. As a result, Ontario processors necessarily incur higher costs to assemble large volumes of high quality domestic beans than the corresponding costs for imported U.S. beans [5]. Thus, domestic prices have been lower than U.S. prices during the entire decade.

FIGURE 8

Weekly July Basis for Soybeans - 1962, 1963 and 1964 Crop

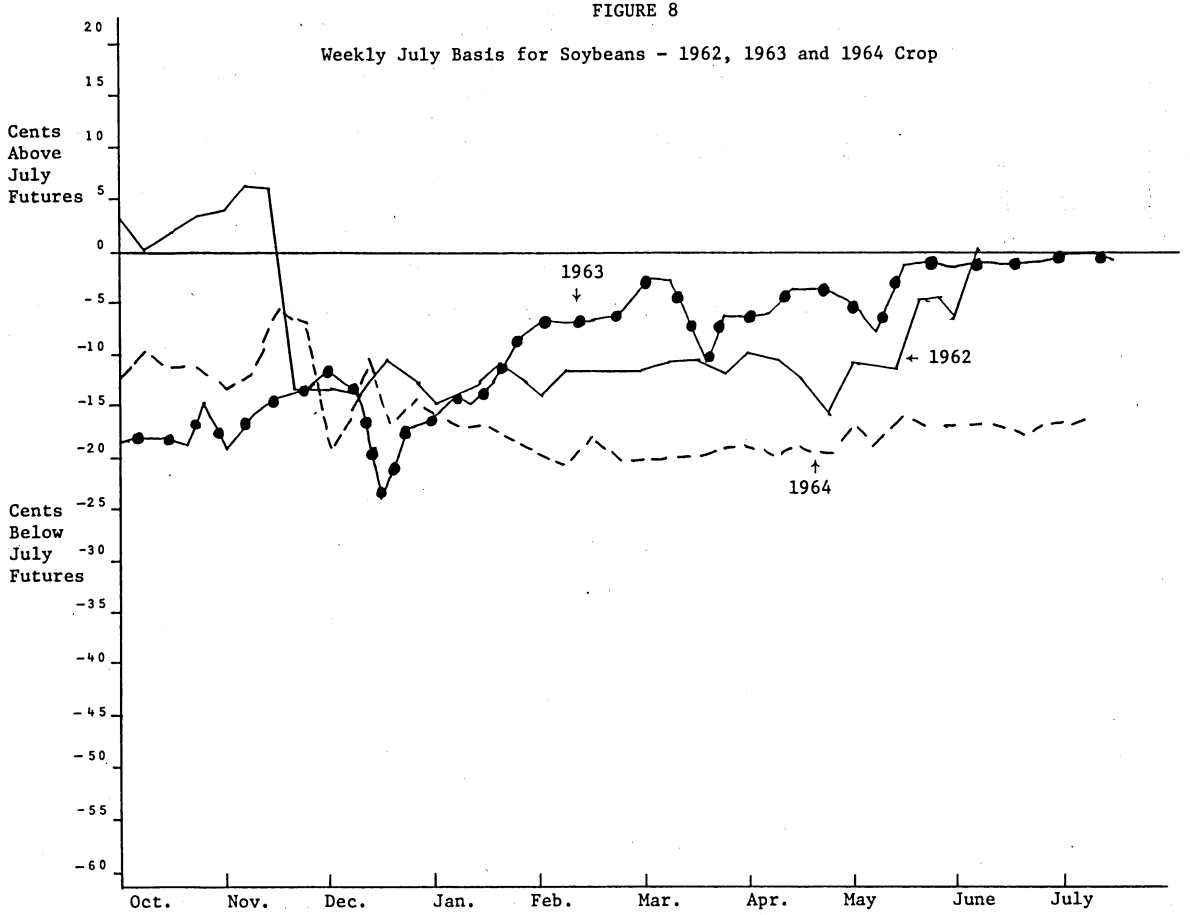


FIGURE 9

Weekly July Basis for Soybeans - 1965, 1966 and 1967 Crop

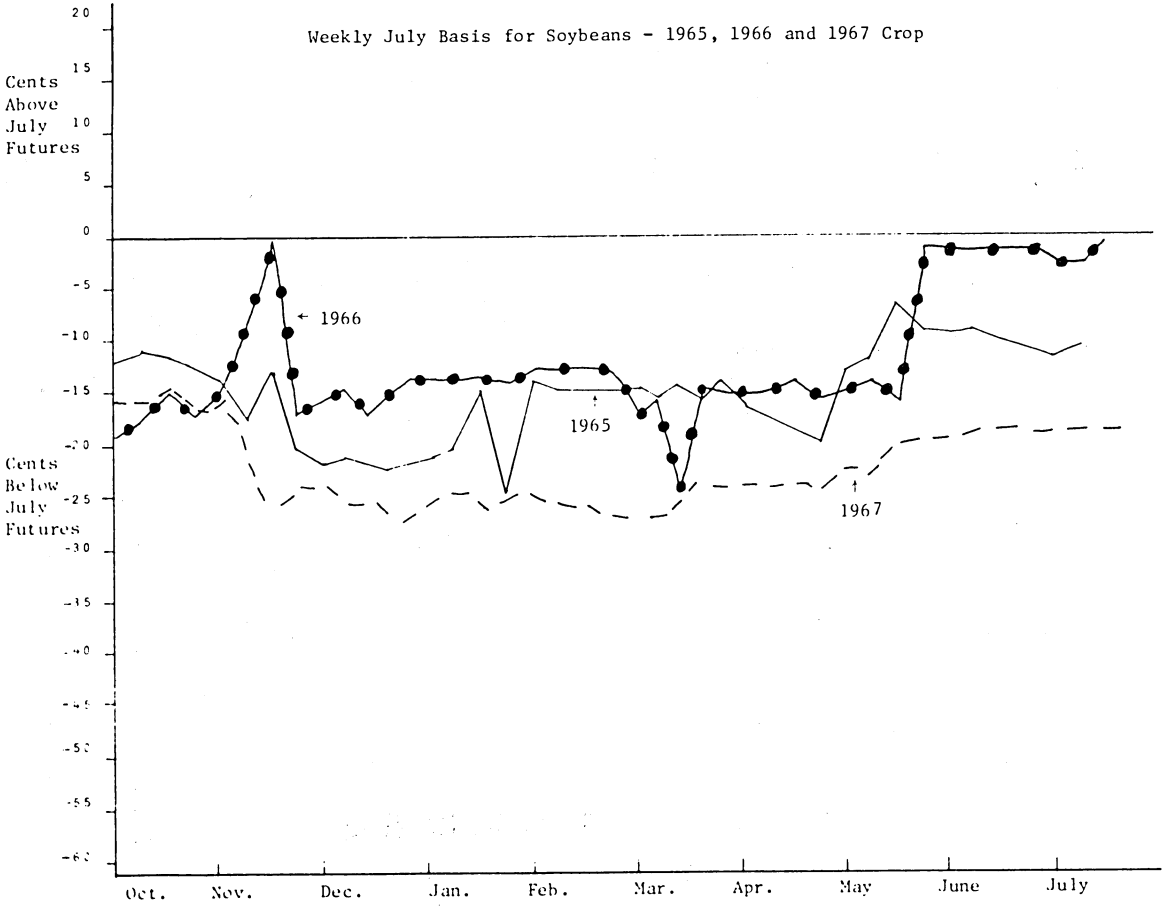


FIGURE 10

Weekly July Basis for Soybeans - 1968, 1969 and 1970 Crop

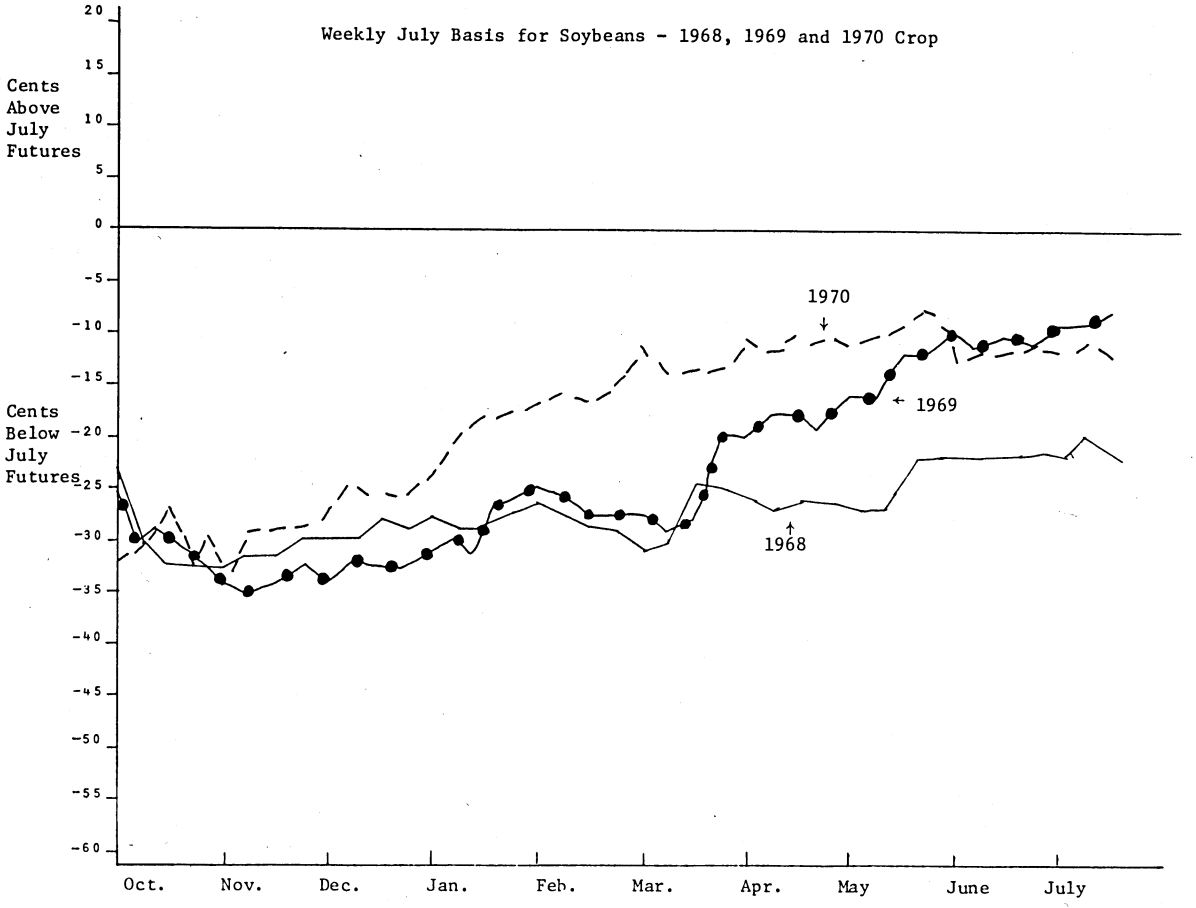
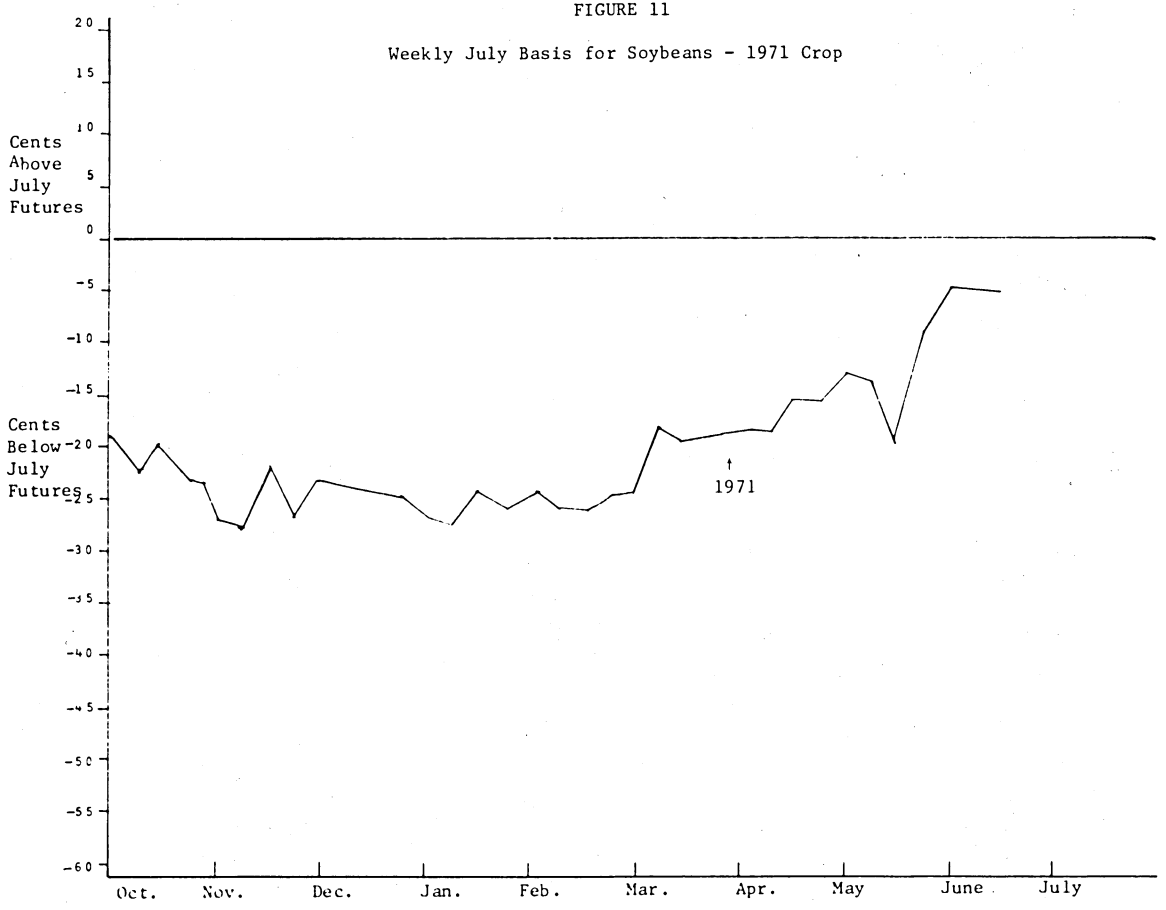


FIGURE 11

Weekly July Basis for Soybeans - 1971 Crop



Examination of actual price fluctuations (see Appendix Table 2) indicates that only two of the three conclusions reached for corn prices hold for soybeans. It was noted first, that corn cash and futures prices generally moved together and second, that cash price fluctuations were normally greater than futures price fluctuations. Both of these conclusions are consistent with basis theory and both also apply to soybean prices. The third conclusion was that in nearly every year, harvest prices of corn were lower than those which existed in either the preceding or following spring and summer. This was not generally true of soybean prices.

In summary, Southwestern Ontario soybean basis patterns conform with basis theory, although there is considerable year to year fluctuation in basis. Year to year fluctuations are not as great as for corn and no substantive change occurred in the nature of soybean basis except for a tendency for a widening of basis at harvest. Price fluctuations occurred as predicted by basis theory, but there were no strong seasonal price trends.

(5.0) USES OF FUTURES IN THE FARM BUSINESS

Now that we have examined basis patterns for Ontario corn and soybeans, it is possible to examine how they can be used by a producer for hedging. There are at least four ways a farmer can use the grain futures market in his farm business. These are; 1. to establish the market price of a crop at the time of planting, 2. to protect the price of a crop being held in storage, 3. to establish the price of feedgrains to be purchased for feeding livestock, and 4. to speculate in the price of grains after harvest when storage is not available. The first two of these are selling, or short hedges, the third is a long hedge, and the fourth is almost purely speculation. Each of the alternatives is discussed below and the outcomes for specific situations which

could have been faced by Ontario farmers are analyzed.

(5.1) Hedging to Establish the Market Price of a Crop at the Time of Planting

In section 4 it was noted in the analysis of Chatham basis patterns, that cash prices of corn are nearly always lower at harvest time than in the spring. In many cases, grain producers do not have storage available for their crops after harvest. Hence, they are obliged to sell their grain at harvest, at the low harvest price. Use of the futures market and knowledge of basis at harvest time can allow the producer to obtain a higher price for his grain and reduce the expected price decline. At the same time, hedging can allow the farmer to forward price his crop.

In order to see how this kind of hedge works, an expected basis for the relevant hedging period needs to be calculated. Expected basis is simply an average calculated from past years' data at the point in time when the hedge is completed. Generally, the delivery month used in a hedge is the one nearest the completion of the hedge. Expected basis is thus calculated by using the price of the futures month that would be traded in the hedge. For example, let us assume that the producer expects to harvest his corn crop the last week in October. We can calculate the expected corn basis by finding the average December basis which occurred at the end of October over several years. December corn bases at Chatham for the last week in October from 1962 to 1971 are presented below.

Basis last week in October;

1962	5.9¢	1965	-3.2¢
1963	6.9	1966	-12.8
1964	-2.8	1967	1.4

1968	-12.3	1970	-19.8
1969	-2.1	1971	-15.1

(average) for 10 years 5.4¢[1/]

Thus the expected basis over the ten year period was 5.4 cents below futures price.

A hedger can now use this information to evaluate the possible outcome of a hedge. This can best be illustrated with an example. Assume that a Southwestern Ontario farmer, in 1967, planned to grow more than five thousand bushels of corn. At the beginning of May 1967 cash corn price was $1.52 and December 1967 futures were trading at $1.472. The producer was interested in investigating the possibility of hedging his corn crop to avoid the price decline he expected at harvest, which we assume to be the last week in October, and he knew from the information above that the expected basis at Chatham the last week in October is 5.4 cents below December futures price. This means that the market is telling him in May that his corn will be worth approximately $1.472 minus the expected basis of 5.4 cents, or $1.418. The price of $1.418 is called the target price. The market may be wrong, but the producer can assure himself of a price very close to the target by hedging if he feels that $1.418 is an acceptable price for his corn crop. He carries out his hedge in the following manner. He plants his corn early in May and therefore is long approximately 5,000 bushels of corn. To hedge, he takes a position in the futures market equal and opposite his cash position. In other words, he sells, or goes short, one December contract (5,000 bu.) at the May trading price of $1.472. During the

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1/ Each of these values is taken from Appendix Table 2. For example, in 1962, cash price at Chatham on October 25 was $1.22 while the December future closed at $1.61. The difference between the two was 5.9 cents as shown above.

last week of October, the producer harvests his corn. In 1967, cash price at Chatham had dropped to $1.25 the last week in October and the December future declined to $1.237. The producer would have completed his hedge by selling his 5,000 bushels of corn at $1.25 and, again going equal and opposite in the futures market, he buys a December contract at $1.237. The outcome of the hedge is that the producer received $1.25 for his corn and made a profit of 23.5 cents per bushel on his futures transaction. Thus, his net price for the corn, by relating the futures transaction to his cash transaction is $1.25 plus 23.5 cents, or $1.485 per bushel (less the commission paid to his broker of $30 or about .6 cents per bushel). The actual price of $1.485 can be compared to the target price of $1.418. In 1967 this hedge insured the producer an actual price very close to his target price of $1.418. The net price was 6.7 cents higher than the target in 1967 because cash price was above December futures price by 1.3 cents instead of being below by 5.4 cents as the producer had expected.

Using the information calculated above, we can evaluate the hedging transaction as a form of price risk insurance. The objective of the hedger in this example was to reduce the possibility of a market price decline between May and October. Specifically, he was aiming at protecting his targeted forward price of $1.418. To accomplish this he took a short position in the futures market to offset his long position in the cash market. The reasoning for this is that if a loss is incurred in the cash market because of a price decline, then an offsetting gain will be made on the futures contract since cash and futures prices generally move together over time.

There is a potential premium that may be paid for this insurance. One part of the premium is the obvious payment of a commission on the futures contract. The second part is the potential loss that the hedger would have incurred if the cash price doesn't decline. In this example, the hedge worked very well as price risk

insurance. The producer received more than his target price of $1.418 and his premium for the insurance actually turned out to be a dividend of 23.5 cents per bushel (less 0.6 cents per bushel for commission) since his net price by hedging was $1.485 instead of the $1.25 he would have received by not hedging and selling at harvest.

We can tabularly summarize the hedging transactions for this example in the following manner.

Date	Cash Position	December Futures Position
May	long 5,000 bushels of corn	short one contract @ $1.472
futures price (December)		$1.472
expected basis		-.054
target price		1.418
October	short 5,000 bushels of corn @ $1.25	long one contract @ $1.237
cash price		$1.25
profit from futures transaction		.235
net price received		1.485
miss of target		.067

Was the producer better off to hedge in 1967? Clearly he was since his net price of $1.485 was 23.5 cents per bushel higher than the price he would have received without hedging.

Let us now investigate the outcomes of similar hedges in each of the years from 1963 to 1971. Results are summarized in Table 1 below. In the upper part of this

TABLE 1

Hedging Corn at Planting Season, Target Prices and Comparison of Target and Realized Prices, 1963-1971

	1963	1964	1965	1966	1967	1968	1969	1970	1971
May Chatham Cash Price	$1.40	$1.44	$1.44	$1.46	$1.52	$1.23	$1.30	$1.36	$1.37
Sell Dec. Futures @	1.24	1.278	1.302	1.297	1.472	1.296	1.319	1.301	1.383
Expected Basis	-.054	-.054	-.054	-.054	-.054	-.054	-.054	-.054	-.054
Target Price	1.186	1.224	1.248	1.243	1.418	1.242	1.265	1.247	1.329
October Chatham Cash Price	1.33	1.25	1.20	1.38	1.25	1.07	1.26	1.28	1.01
Buy Dec. Futures @	1.261	1.278	1.232	1.508	1.237	1.193	1.281	1.478	1.161
Profit or loss (-) on futures	(-.021)	0	.07	(-.211)	.235	.103	.038	(-.177)	.222
Net Price Received[1/]	1.31	1.25	1.27	1.169	1.485	1.173	1.298	1.103	1.222
Target Miss	.124	.026	.022	-.074	.067	-.069	.023	-.144	-.107

Computed from Appendix Table 2.

[1/] Net price does not include a deduction of approximately 0.6 cents for commission on the futures contracts and ½ to ¾ of a cent per bushel for interest foregone on the margin requirement.

Table, futures transactions during the first week in May are summarized and the target price, using the expected basis, is calculated. In the lower part, Chatham cash price (at which the producer sells his harvested corn) is listed first, followed by the December futures price at which the contract is bought back. Below, the net price received by hedging in each year is calculated by adding (or subtracting) the gain (or loss) on the futures contract to the cash price. Finally, the target miss indicates the difference between the actual net price received by hedging and the target price.

The summary indicates several important characteristics about this hedge which are of importance to Southwestern Ontario corn producers. First, it results in moderately good performance as a means of insuring against market price risk. In six of the nine years, the net price received was within seven cents of the target price estimated in May.

Second, the summary indicates that in six of the nine years investigated, the producer would have paid nothing or received a dividend by hedging to insure against a price decline. In other words, in most years the hedge resulted in less price risk and provided the producer a net price that was the same as or higher than the price he would have received by selling at harvest. The most important years when the net price was lower than cash price were 1966 and 1970. 1966 was a year of relatively high feedgrain prices at harvest mainly because of droughts in Asia. In 1970, corn prices were high in the fall because of the U.S. corn blight. In both years, the Chatham cash price experienced a small decline from May to October, but the December futures price increased substantially. This allows us to point out a third important characteristic of hedging. That is, it is very flexible. If one had been hedging in these two years, he would have been better off to liquidate his futures position in the late summer when futures prices began to rise in response to the unique situations which

existed. It was clear in these two years that price risk insurance was not needed. Early liquidation of the contract would have minimized the premium paid for the insurance.

A fourth characteristic which should be pointed out is that even though this hedge substantially reduces price risk, there is still considerable variation in the target miss because of the variation in Chatham basis. Wide variation in target miss can be expected until the Chatham basis becomes more regular and there is less fluctuation around the expected basis. As a comparison, Hieronymus [3] conducted a similar analysis over seven years in the late 1950's and early 1960's for East Central Illinois. His analysis resulted in target misses of from $2\frac{3}{8}$ cents to only $4\frac{1}{4}$ cents over the seven year period, which reflects the more predictable nature of basis in that area. Despite this, it is clear that there is much less variation in basis than in cash prices at Chatham.

In Table 2, a similar summary of the analysis of a planting season hedge for soybeans is presented for the years from 1963 to 1971. In this case, we assume that planting season is the second week of May (i.e., when the hedge is initiated) and harvest is the third week in October (when the hedge is completed).

From the analysis of soybean basis pattern in section 4, we compute the expected harvest basis for soybeans at 9.3 cents under November futures price. Thus, the target price for each year is 9.3 cents less than the November futures price which is observed the second week in May. Data in Table 2 indicate that the information learned from section 4 has a profound affect on the outcomes of forward selling hedges for soybeans. First, this hedge for soybeans was relatively effective in most years as evidenced by the small miss of target. However, there is some doubt that price risk insurance is needed for soybeans at harvest time since harvest price was higher,

TABLE 2

Hedging Soybeans at Planting Season, Target Prices and Comparison of Target and Realized Prices 1963-1971

	1963	1964	1965	1966	1967	1968	1969	1970	1971
2nd wk May Cash Price	$2.735	$2.583	$2.873	$3.19	$2.908	$2.718	$2.645	$2.718	$2.89
Sell Nov. Futures @	2.703	2.578	2.680	3.01	2.983	2.834	2.550	2.795	2.901
Expected Basis	-.093	-.093	-.093	-.093	-.093	-.093	-.093	-.093	-.093
Target Price	2.610	2.485	2.587	2.917	2.890	2.741	2.457	2.702	2.808
3rd wk October Cash Price	2.863	2.883	2.665	3.16	2.793	2.515	2.485	2.853	3.128
Buy Nov. Futures @	2.917	2.918	2.660	3.183	2.838	2.710	2.622	3.087	3.243
Profit or loss (-) on futures	(-.214)	(-.34)	.02	(-.173)	.145	.124	(-.072)	(-.292)	(-.342)
Net Price Received[1/]	2.649	2.543	2.685	2.987	2.938	2.639	2.413	2.611	2.786
Target Miss	.039	.058	.098	.070	.048	-.103	-.044	-.091	-.022

Computed from Appendix Table 3.

1/ Net price does not include a deduction of approximately 0.6 cents for commission on the futures contracts and 1/2 to 3/4 of a cent per bushel for interest foregone on the margin requirement.

as noted in section 4, in several years, Because of this, the cost of using the hedge as insurance was great in several years as indicated by the loss on the futures contract. However, as was the case with corn, in several years it would have been possible to forsee the higher harvest prices in the late summer. If this were the case, the producer could have liquidated his futures contract in the summer, thereby minimizing the cost of his hedging operation and taking advantage of a speculative gain on his cash position.

The above analysis for forward price hedges at harvest time can be summarized as follows. For both corn and soybeans this hedge is a relatively effective tool which farmers can use to reduce the risk of a harvest price decline. For this reason it has the advantage of providing the producer a relatively reliable prediction of what his price will be for the harvested product while it affords him the flexibility of being able to liquidate his futures position at any time when new market information is indicating that market price will not decline.[1/] This latter

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1/ Two possible pitfalls to hedging should be pointed out at this juncture. First, hedging can't protect against physical crop loss. It is probably best if a producer hedges something less than he expects to produce to protect against a lower than expected yield for his crop. For example, if a farmer expects to produce 10,000 bushels of corn and sells two contracts at planting time, then experiences a shortfall in yield such that only 8,000 bushels are produced, he is effectively speculating on 2,000 bushels of corn. Second, while hedging allows the producer a great deal of flexibility, it should be remembered that trading contracts is not free. While trading in and out during the hedging period may be beneficial to the hedger, he must also consider that each round turn costs $30.

point is very important. If the producer does not hedge, he is speculating on his inventories. There is no choice but to take the harvest price for his grain when storage is not available. However, if he hedges, he has flexibility throughout the life of the hedge. When the hedge is initiated, he has the flexibility of evaluating whether the target price is acceptable. If not, i.e. if the producer feels that the target is lower than harvest price will be, he can choose not to hedge, or he can initiate the hedge on another date when the target price seems more favorable. Similarly, as we saw above, the hedger can liquidate his position at any point during the hedging period if it appears that prices will be greater at harvest than expected and insurance is therefore not needed.

It may be well to note that the most important disadvantage of the hedging activity discovered in the above analysis was that there was considerable variation in the harvest basis for both corn and soybeans. This was to be expected from the analysis carried out in section 4. In that discussion it was pointed out that Chatham cash prices for both corn and soybeans have fallen somewhat in the past few years in relation to futures prices because of structural characteristics of the markets. This has had the effect of causing a larger variation around the expected basis at harvest. More particularly the harvest basis for both crops has tended to become larger (negatively) in the past three or four years. This would lead to the conclusion that if a producer were to hedge these crops, he would probably be wise to use an expected basis of perhaps eleven or twelve cents under the December for corn and twelve cents under the November for soybeans in calculating his target price - particularly if acreages of corn and soybeans in Ontario continue to expand over the next few years. If we substitute these values into Tables 1 and 2 and use them to recalculate target prices for the years since 1968 for both crops, it can be seen that the target prices are considerably closer to the net prices received by hedging both crops in all cases except for corn in 1969.

(5.2) Hedging to Protect the Price of a Crop Being Held in Storage

Table 3 contains a summary of transactions for hedges from 1963 through 1972, against losses incurred from a price decline while corn is in storage. The opportunity for a hedge of this type arises when a farmer has grain in storage either on his farm or in a local elevator. The mechanics of the hedge are the same as for the planting hedge. First, the farmer determines the expected basis at the time he plans to sell his corn. In this case we assume that he plans to sell during the last week in June, and that the July future is appropriate for the futures transaction. The expected July basis for the last week in June over the ten years from 1963 to 1972 at Chatham was 7.3 cents above July futures. Thus, the farmer can compute his target price when he initiates the hedge by adding 7.3 cents to the current July futures price. In Table 3, we have initiated the hedge during the first week in January because our earlier analysis indicates that harvest corn prices are normally seasonally low but that they increase rapidly in December (see Appendix Table 2). Therefore, there is very little risk of a price decline until post harvest prices have been established and thus, no need to hedge.

Assuming then, that the hedge is initiated at the beginning of January, the producer adds the expected basis to the January trading price of the July contract. For example, in January 1965, cash price was $1.30 and the July contract was trading at $1.395. Target price was therefore $1.468 ($1.395 plus 7.3 cents). If the farmer feels that $1.468 is a reasonable price for his corn in July, he sells July futures (in an amount approximately equal to the quantity in storage) at $1.395. In 1965, both cash and July futures prices increased from January to the end of June to $1.51 and $1.427 respectively. Thus, the hedger would have lost 3.2 cents per bushel on

TABLE 3

Hedging Corn in Storage from January to June, Target Prices, Comparison of Target Prices and Realized Prices, and Return to Storage, 1963-1972

	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
January										
Ontario Cash Price	$1.41	$1.42	$1.30	$1.48	$1.58	$1.28	$1.27	$1.30	$1.47	$1.21
Sell July Futures @	1.25	1.344	1.395	1.414	1.575	1.355	1.334	1.356	1.640	1.273
Expected Basis	.073	.073	.073	.073	.073	.073	.073	.073	.073	.073
Target Price	1.323	1.417	1.468	1.487	1.648	1.428	1.407	1.429	1.713	1.346
June										
Ontario Cash Price	1.49	1.46	1.51	1.51	1.56	1.28	1.56	1.40	1.46	1.19
Buy July Futures @	1.385	1.329	1.427	1.437	1.406	1.207	1.365	1.412	1.608	1.155
Profit or loss (-) on futures	(-.135)	.015	(-.032)	(-.023)	.169	.148	(-.031)	(-.056)	.032	.118
Net Price Received[1/]	1.355	1.475	1.478	1.487	1.729	1.428	1.529	1.344	1.492	1.308
Target Miss	.032	.058	.01	0	.081	0	.122	-.085	-.221	-.038
Return to Storage	-.055	.055	.178	.007	.149	.148	.259	.044	.022	.098

Computed from Appendix Table 1.

[1/] Net price does not include a deduction of approximately 0.6 cents for commission on the futures contracts and ½ to ¾ of a cent per bushel for interest foregone on the margin requirement.

the futures contract and received a net price of $1.478 for his corn. In other words, he protected his target price of $1.468 by hedging since his net price was only one cent different (higher). In this particular year the price risk insurance cost him 3.2 cents per bushel because the June cash price was 3.2 cents higher than the net price.

The transactions summarized in Table 3 indicate that in all but two of the ten years a producer would have been able to assure his price within eight cents by hedging at the beginning of January. In the other years, enough flexibility existed that the futures position could have been liquidated in late winter or early spring without paying unacceptably high price risk insurance premiums. Furthermore, the average price received with hedging over the period was $1.463 and without hedging, it was $1.442. While this average means very little in itself, it indicates that the hedging mechanism offers not only price protection, but, during this period it also offered the possibility of somewhat higher returns.

A final set of information in Table 3 is the return to storage. Return to storage is simply the difference between the net price received and the cash price at the time the hedge was initiated (in January). It represents the amount which the market is willing to pay the producer for performing the storage function. Table 3 indicates that in six of the ten years, the producer would have received at least 5.5 cents per bushel (up to 25.9 cents) by hedging. If the producer has knowledge of his storage costs, he can use this information to evaluate his decision to hedge, or even to store his corn. For example, if the cost of storage per bushel from January to June is 9 cents (not an unreasonable assumption at present local elevator rates [6]) he can compare the target price to the January cash price to estimate his return to storage. Using this example and comparing the

storage cost to target prices over the ten year period, we find that the target price minus 9 cents was less than January cash price in 1963, 1964, 1966 and 1967. Thus, the farmer may have been ahead to sell in January and neither hedge nor store corn in those years. Following this rule does not always insure that the right decision will be made, but over the ten year period, if a farmer had sold in the years listed above and hedged in the other six years, he would have made the right decision eight times. The exceptions were: 1970 when the decision was to hedge, but prices increased in response to the fear of a corn blight in the U.S., so that both the target prices and the expected return to storage were not attained; and 1971, when the decision was to hedge but, basis was approximately the same in both January and June because the market was apparently waiting to see what the effects of the corn blight would be.

Table 4 presents a summary of storage hedges for soybeans from crop years 1962 through 1971. Since the basis investigation in section 4 showed little seasonal price decline at harvest time, the hedge was initiated at harvest (third week in October) and completed the second week in May using the May contract to hedge. Expected basis the second week in May was calculated at 12.9 cents below May futures.

Table 4 indicates that the producer would have been indifferent between hedging and simply storing soybeans over the 10 years since the net price received by hedging was, on the average, no better than the cash price received by storing and selling during the second week in May. However, there are two important implications which can be drawn from Table 4. First, the miss of target was relatively small for all years. Hedging thus allowed the actual price received to be predicted within a very narrow range because the May basis has been quite regular during the past decade. Therefore, as price risk

TABLE 4

Hedging Soybeans in Storage from Harvest to May, Target Prices, Comparison Target Prices and Realized Prices, and Return to Storage, 1963-1972

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
October 17 (wk 3) Ontario Cash Price	$2.663	$2.86	$2.883	$2.66	$3.16	$2.79	$2.515	$2.48	$2.853	$3.128
Sell May Futures @	2.632	3.022	2.999	2.78	3.294	2.937	2.834	2.763	3.131	3.297
Expected Basis	.129	.129	.129	.129	.129	.129	.129	.129	.129	.129
Target Price	2.503	2.893	2.87	2.651	3.165	2.808	2.705	2.634	3.002	3.168
May 10 (wk 31) Ontario Cash Price	2.688	2.658	2.923	3.16	2.878	2.71	2.645	2.70	2.84	3.334
Buy May Futures @	2.792	2.749	3.11	3.243	3.022	2.917	2.872	2.832	2.923	3.432
Profit or loss (-) on futures	(-.160)	.273	(-.111)	(-.463)	.272	.020	(-.038)	(-.069)	.208	(-.135)
Net Price Received[1/]	2.528	2.931	2.812	2.697	3.150	2.73	2.607	2.631	3.048	3.199
Target Miss	.025	.038	(-.058)	.046	(-.015)	(-.078)	(-.098)	(-.003)	.046	.031
Return to Storage	-.135	.071	-.021	.037	-.010	-.060	.092	.151	.195	.071

Computed from Appendix Table 3.

1/ Net price does not include a deduction of approximately 0.6 cents for commission on the futures contracts and ½ to ¾ of a cent per bushel for interest foregone on the margin requirement.

insurance, the harvest to May hedge worked very well, although it could have been expensive in some years if the producer did not exercise its flexibility by liquidating the futures position when prices were rising.

Second, it is also important to note the returns to storage. In several of the years, return to storage was negative. Had the producer based his storing and hedging decision on the target price estimated in October, in the manner discussed above for the corn analysis, he would have sold at harvest in all years but 1968, 1969 and 1970, and he would have made the correct decision in nine of the ten years. The only exception was in 1965 when the target price in October was only $2.651 while cash price rose to $3.16 in May. In this case the producer, although the target price indicated that he should sell at harvest, would clearly have been better off to store his corn without hedging. In both 1968 and 1969, comparison of target price minus the storage cost with the October cash price would have resulted in a decision to store and hedge. While this strategy resulted in a reasonable return to storage, it did not return as much as unhedged soybeans would have. Again, prices rose over the storage period and hedging losses could have been considerably minimized by liquidating the futures position early in the storage period.

(5.3) Hedging to Minimize the Price of Feedgrains to be Purchased Later

The need for this type of hedge can arise when a livestock producer knows that he will be buying feed at a date and he would like to attempt to hedge against possible price increases in the future. Of the two crops we are considering in this analysis, the situation could arise for a livestock producer who intends to buy corn in the future. From our analysis of corn basis and prices in section 4, it would seem that the best time to initiate

the hedge is at harvest time when the Ontario corn price is normally low. The producer can estimate his needs for purchased corn at particular times after harvest and then hedge to protect the lower harvest price.

The mechanics of this type of hedge are exactly opposite those of the earlier two types discussed. At harvest, the farmer who needs to buy corn later, is short the amount of corn he needs to buy. Thus, his hedging position would be equal and opposite his cash corn position. That is, he would be long, i.e. buy, futures. As in the earlier types of hedges, the farmer should first evaluate the hedge by estimating a target price with his knowledge of expected basis. We may illustrate with examples of purchase hedges carried out from harvest (at the end of October) to the first week in May for corn harvested from 1962 through 1971. The expected May basis the first week in May over this period was 1.2 cents above, or cash price at Chatham was, on the average, 1.2 cents above May futures. The livestock producer, who is hedging can add the expected basis to the May trading price the last week in October to estimate his target price. If he feels that the target is reasonable, he buys May contracts in October and then sells them in May when he buys the corn. His net price paid is then the cash price in May plus or minus loss or profit on the futures transaction.

Let us take as an example, the year 1964. Assume that a farmer has produced corn of his own which he has in storage on the farm. He knows however, that all his corn will be used up in early May and at that time he will have to buy an additional 5,000 bushels. He would prefer to buy corn at the (low) October price, but he is short of storage space and therefore wants to investigate the possibility of hedging the purchases he will have to make for use from May onward at unknown prices. The May future was trading at $1.351 and cash corn at $1.25 in October. Thus, the May target price was $1.363 ($1.351 plus .012).

In May, cash price had risen to $1.44 and the May future to $1.442. Thus, the producer would have bought 5,000 bushels of corn at $1.44, sold the May contract at $1.442 at a profit of 9.1 cents. Deducting the 9.1 cents from $1.44, the actual cost of corn in May was $1.349, and the target price was missed by only 1.4 cents. While the hedge reduced the producer's price from $1.44 to $1.349, this price was still higher than the cost of corn in October would have been. The difference between the October cash price and the net price paid, can be considered the price the hedger pays someone else to store corn for him from October to May.

The information in Table 5 indicates that the performance of this hedge as a price predictor was not good, as evidenced by the variation in target miss. This was due to the very wide fluctuations which existed in the Chatham May corn basis over the ten year period. Basis ranged from 12.3 cents above in 1962 to 14.0 cents below in 1971 and, as our basis analysis in section 4 indicated, there was a definite trend toward the negative basis because of structural changes in the corn market. This would indicate that the potential hedger should use a figure of perhaps five to eight cents below the May future in computing a target price for this hedge.

On the other hand this hedging strategy allowed the producer to counteract the price increase which takes place for corn after harvest most years and resulted in a lower cost of purchased corn in seven of the ten years analyzed. In two of the remaining three years, cash price increased over the period, but the May futures price decreased, indicating either a strong local demand for corn or an overvaluation of May corn in October of those two years.

TABLE 5

Hedging Corn to be Purchased Later From Harvest to May, Target Prices and Comparison of Target and Actual Prices, 1962-1971

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
October Chatham Cash Price	$1.22	$1.33	$1.25	$1.20	$1.38	$1.25	$1.07	$1.26	$1.28	$1.01
Buy May Futures @	1.225	1.337	1.351	1.306	1.524	1.329	1.28	1.337	1.57	1.243
Expected Basis	.012	.012	.012	.012	.012	.012	.012	.012	.012	.012
Target Price	1.237	1.349	1.363	1.318	1.536	1.341	1.292	1.349	1.583	1.255
May Chatham Cash Price	1.40	1.44	1.44	1.46	1.52	1.23	1.30	1.36	1.37	1.19
Sell May Futures @	1.277	1.348	1.442	1.361	1.424	1.227	1.349	1.372	1.456	1.33
Profit or loss (-) on futures	.052	.011	.091	.055	(-.10)	(-.102)	.069	.035	(-.115)	.087
Net Price Paid[1/]	1.348	1.429	1.349	1.405	1.62	1.332	1.231	1.325	1.485	1.103
Target Miss	.111	.080	-.014	.087	.084	.011	-.061	-.024	-.098	-.152

1/ Net price does not include the addition of approximateiy 0.6 cents for commission on the futures contracts and $\frac{1}{2}$ to $\frac{3}{4}$ of a cent per bushel for interest foregone on the margin requirement.

(5.4) Speculating in a Crop With Futures To Replace Cash Grain Sold at Harvest

The need for this kind of transaction arises when a grain producer feels that cash prices will rise after harvest, but he is unable to take advantage of the increase because of a lack of storage space.

It should be pointed out that this transaction is not hedging in the normal sense. In fact, it is almost exactly the same as speculating with cash grain in a bin or an elevator. There are two differences. First, there is no storage cost to consider (although there are, of course, commission charges and the interest foregone on the margin deposit to consider). Second, the futures transaction can be tied to the cash transaction by adding or subtracting the profit or loss from the futures transaction to the price received for grain sold at harvest to determine the net price received for the crop.

In Table 6, the outcomes of speculative transactions for corn and soybeans are summarized from 1962 to 1971. In each case, the grain is sold at harvest (last week in October for corn, third week for soybeans) and July futures are purchased simultaneously. Then a July contract is sold the first week of July and the net price received is calculated.

Table 6 indicates that a farmer could have profited by replacing cash inventories in six of the ten years analyzed for corn and in seven of the ten years for soybeans. For the years when losses were incurred, the July price fell rather steadily over the October to July period and the producer could have minimized his losses by closing his position at an earlier date.

TABLE 6

Purchase of Futures To Replace Cash Grain Sold at Harvest, 1962-1971

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Corn										
October										
Sell Corn @	$1.22	$1.33	$1.25	$1.20	$1.38	$1.25	$1.07	$1.26	$1.28	$1.01
Buy July Futures @	1.24	1.356	1.373	1.328	1.554	1.358	1.301	1.393	1.591	1.282
July										
Sell July Futures @	1.395	1.325	1.396	1.438	1.416	1.19	1.359	1.41	1.616	1.215
Profit or loss (-) on futures	.155	(-.031)	.023	.110	(-.138)	(-.152)	.058	.017	.015	(-.067)
Net Price	1.375	1.299	1.273	1.310	1.242	1.098	1.128	1.277	1.295	.943
Soybeans										
October										
Sell Soybeans @	2.663	2.863	2.883	2.665	3.16	2.793	2.515	2.485	2.853	3.128
Buy July Futures @	2.638	3.039	2.996	2.788	3.313	2.95	2.838	2.775	3.131	3.333
July										
Sell July Futures @	2.85	2.687	3.169	3.981	3.069	2.863	2.872	3.016	3.283	3.497
Profit or loss (-) on futures	.212	(-.352)	.173	1.193	(-.244)	(.087)	.034	.241	.152	.164
Net Price	2.875	2.511	3.056	3.758	2.916	2.880	2.549	2.726	3.005	3.292

Computed from Appendix Tables 2 and 3.

(6.0) PROBLEMS WHICH THE HEDGER SHOULD AVOID

Throughout the above discussion, several possible problems which the futures trader should avoid were mentioned. It may be beneficial to reiterate these and point out others.

First, the example hedges calculated in this report followed a highly mechanistic procedure in that the dates for the initiation and completion of each hedge were the same every year. In reality, the hedger would be concerned with watching the level of basis. The hedge would, therefore, be completed at the time when basis is at or near the expected basis level used in estimating target price instead of at a fixed date. This implies that the hedger must be aware of not only the cash price of his crop, but also of the cash-futures price relationship at all times. In other words, he is compelled to invest a somewhat larger proportion of his time in order to perform his marketing function well.

Second, it was emphasized that when a grain producer is hedging against a harvest price decline for a crop which has been planted, he might be wise to hedge less than he plans to harvest in case of a low yield or in case of crop damage. If his actual harvest is less than his futures position, he is effectively speculating on the number of bushels of the futures contract not covered by the cash position.

Third, while we have emphasized that hedging allows the producer a great deal of flexibility because of the opportunity to close the futures position when futures prices change, it should be remembered that trading in and out can become expensive because of commission charges. Thus, while a producer can change his futures position several times during a storage or growing season and add

to his speculative gains, he can also reduce his gains and considerably increase the cost of price risk insurance by incurring commission charges at 0.6 cents per bushel.

Fourth, is the problem of improper calculation of basis or failure to relate basis properly to estimate the target price. Improper calculation of basis or adding or subtracting basis incorrectly can result in a wrong target price and therefore a wrong decision. A closely related factor here is the determination of the proper basis for a given producer. All basis calculations in this study were determined for Chatham. It was pointed out that basis varies over space. Therefore, while the Chatham basis may be appropriate for producers in Southwestern Ontario, they may be entirely inappropriate for producers in other locales. In most cases producers in other parts of the Province could calculate an expected basis by adding transportation costs from Chatham to their local market to the Chatham basis.

Fifth, it was noted that basis patterns - particularly for corn - have undergone a secular change in recent years. This trend may continue in the future so that it will be necessary to recalculate expected basis as time passes. If this is not done, and the secular change continues, target prices will not reflect the existing structure of the market and incorrect decisions could result.

Sixth, when expected basis is recalculated, it is necessary to adjust futures prices for exchange rate fluctuations. Since, as we have seen, Ontario cash and futures prices generally move together, they must be expressed in the same unit.

Seventh, it is important to remember to take a futures position which is opposite the cash position. Failure to take an opposite position means that a farmer can be speculating in both futures and cash grain. This contravenes the concept of hedging and, more importantly, opens the producer to speculative losses in both positions.

Finally, the flexibility of hedging allows the opportunity of not closing the futures position at the same time as the cash position is closed. Often a producer may have profited on his cash position, but lost on his futures position. While the hedge may have allowed the producer to meet his target price, he is reluctant to take the futures loss. Holding the future's position open after the cash position is closed means there is as much likelihood of further losses as of gains, which could effectively erase the protection afforded by hedging. Thus, the hedger should avoid mixing a hedging activity with a purely speculative one.

The above discussion implies that if a producer intends to enter into a hedging transaction, he should develop a careful hedging strategy and vary from it only when he has a very good reason.

(7.0) SUMMARY

Ontario farmers have significantly increased corn and soybean production in the past decade. Much of the production increases have resulted from increased use of sophisticated production techniques. There is now a need for more sophisticated marketing techniques which farmers can use to stabilize their expected prices and, perhaps, to increase their incomes from the crops they produce. One such technique is the futures market, which farmers with sufficient knowledge can use to reduce price risks and, in some cases, to improve net returns from their crop activities.

This study has attempted to briefly outline the trading mechanism for futures markets, the concept and importance of basis which is the relationship over time and space between cash and futures prices, basis relationships for corn and soybeans in Southwestern Ontario, how

futures markets can be used in the farm business, and the outcomes of alternative types of transactions which could have been carried out by farmers in Ontario over the past decade.

Producers hedge by taking a position in the futures market which is equal and opposite an existing position in a cash market. This action reduces price risks to the producer by shifting risks to speculators. At the same time, because of predictable basis relationships, the hedging activity allows the producer the opportunity of stabilizing his prices and often of profiting from relative movements of cash and futures prices.

The decision to hedge is based on a target price which is, in turn, based on an expected basis at the end of a hedging period. Basis varies over time and space. Basis for corn and soybeans at Chatham was analyzed over the past decade. The analysis indicated that corn and soybean basis patterns at Chatham conform generally to basis theory and that Chatham prices are closely related to Chicago prices. However, recent structural changes, particularly in the corn market, have caused considerable fluctuation in basis patterns.

Futures markets can be used in conjunction with the farm business in four ways. These are; (1) to establish the price of a crop at planting time, (2) to protect the price of a crop held in storage, (3) to minimize the price of feedgrains to be purchased later, and (4) to speculate in a crop with futures to replace grain sold at harvest. Outcomes of transactions representing each of these uses were analyzed over the past decade for situations which could have been faced by Ontario farmers. In general, it was found that hedging can provide a flexible alternative marketing method for Ontario farmers and one which can substantially decrease price risks. The largest disturbance factor in hedging is the variability of basis - particularly

in the past four years. However, suggestions were made for alternative expected basis levels which take structural changes into consideration and bring net prices closely into line with target prices so that hedging viability can be judged before the initiation of a hedge.

Hedging is not without costs. It's use is mainly to protect the producer against adverse market developments. If there are no adverse developments, the costs can be high. There is also a fair amount of technical knowledge which must be mastered by the producer in order to avoid costly mistakes. However, with the information contained in this report and a good knowledge of market conditions, a producer should be able to make effective use of this marketing tool.

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APPENDIX

APPENDIX TABLE 1

Cash-Futures Soybean Price Relationships at Chicago, 1968 Crop Year

Date		Chicago Cash Price	January Futures Price	January Basis	March Futures Price	March Basis	May Futures Price	May Basis	July Futures Price	July Basis
October	3	$2.47 1/2	$2.54	$-.06 1/2	$2.57 1/2	$-.10	$2.59 3/4	$-.12 1/4	$2.55 1/2	$-.08
	10	2.46 3/4	2.54 3/8	-.07 5/8	2.58	-.11 1/4	2.60 5/8	-.13 7/8	2.60 3/4	-.14
	17	2.46 1/2	2.55 3/4	-.09 1/4	2.60 1/8	-.13 5/8	2.63	-.16 1/2	2.63 3/8	-.16 7/8
	24	2.46 3/4	2.55 3/8	-.08 5/8	2.59 1/2	-.12 1/4	2.62 1/2	-.15 1/4	2.63 1/2	-.16 3/4
	30	2.52 1/4	2.56 3/4	-.04 1/2	2.61 1/8	-.08 3/8	2.64	-.11 3/4	2.65	-.12 3/4
November	7	2.49 3/4	2.58 3/4	-.09	2.63 5/8	-.14 7/8	2.66 1/4	-.16 1/2	2.67 1/2	-.17 3/4
	14	2.54	2.59 5/8	-.05 5/8	2.64 1/2	-.10 1/2	2.67	-.13	2.67 5/8	-.13 3/8
	21	2.54 1/2	2.57 7/8	-.03 3/8	2.62 3/4	-.18 1/4	2.65 1/2	-.11	2.67	-.12 1/2
	27	2.56 3/4	2.59 5/8	-.02 7/8	2.63 3/4	-.07	2.66 1/2	-.09 1/4	2.67	-.10 1/4
December	5	2.57	2.57	.00	2.61 1/4	-.04 1/4	2.64 1/8	-.07 1/8	2.64 3/4	-.07 3/4
	12	2.59 1/2	2.59 1/2	.00	2.62 1/2	-.03	2.65 1/4	-.05 3/4	2.66 1/4	-.06 3/4
	19	2.61	2.60	.01	2.64	-.03	2.66 1/4	-.05 1/4	2.66 1/4	-.05 1/4
	26	2.61 1/4	2.60 1/8	.01 1/8	2.63 7/8	-.02 5/8	2.66 1/2	-.05 1/4	2.66 3/4	-.05 1/2
January (1969)	2	2.62 3/4	2.60 1/8	.02 5/8	2.63 5/8	-.00 7/8	2.66	-.03 1/4	2.66	-.03 1/4
	9	2.61 1/2	2.59 1/2	.02	2.63 5/8	-.02 1/4	2.66 3/4	-.05 1/4	2.67 1/4	-.05 3/4
	16	2.63 3/4	2.60 3/4	.03	2.64 3/4	-.01	2.67 3/4	-.03	2.68	-.04 1/4
	23	2.63 1/2			2.64	-.00 1/2	2.67 1/4	-.03 3/4	2.68 1/2	-.04 3/4
	30	2.65			2.65	.00	2.67 1/2	-.02 1/2	2.69 3/8	-.04 5/8
February	6	2.64 3/4			2.64	.00	2.66 7/8	-.02 1/8	2.68	-.03
	13	2.64 1/2			2.63 7/8	.00 5/8	2.67 1/2	-.03	2.68 3/4	-.04
	20	2.64 1/2			2.63 5/8	.00 7/8	2.67 1/2	-.03	2.69 1/4	-.05 3/4
	29	2.64			2.62 1/2	.01 1/2	2.66 3/4	-.02 3/4	2.68 3/4	-.04 3/4

TABLE 1 cont'd

Date		Chicago Cash Price	January Futures Price	January Basis	March Futures Price	March Basis	May Futures Price	May Basis	July Futures Price	July Basis
March	6	$2.61 1/4			$2.59 1/4	$ .02	$2.64 3/8	$-.03 1/4	$2.67 1/8	$-.05 7/8
	13	2.65			2.60 5/8	.04 3/8	2.65 1/8	-.00 1/8	2.67 3/4	-.04 3/4
	20	2.64 3/4			2.59 3/4	.05	2.63 5/8	.01 1/8	2.66 7/8	-.02 1/8
	27	2.66					2.62 1/2	.03 1/2	2.66	.00
April	3	2.66 1/2					2.61 7/8	.05 5/8	2.65 5/8	.00 7/8
	10	2.68					2.64 5/8	.03 3/8	2.68 5/8	-.00 5/8
	17	2.69 3/4					2.65 3/4	.04	2.69 1/2	.00 1/4
	24	2.70 1/4					2.66 1/8	.04 1/8	2.69 7/8	.00 3/8
May	1	2.70					2.65 1/2	.04 1/2	2.70 1/4	.00 1/4
	8	2.72 3/4					2.66 3/4	.06	2.71	.01 3/4
	15	2.74					2.67	.07	2.70 7/8	.03 1/8
	22	2.72 1/2							2.68 3/8	.04 1/8
	29	2.71 1/2							2.67 1/4	.04 1/4
June	6	2.72							2.66 5/8	.05 3/8
	12	2.70							2.65 1/4	.04 3/4
	19	2.70 3/4							2.66 3/4	.04
	26	2.67 1/2							2.63 7/8	.03 5/8
July	3	2.70							2.66 3/4	.03 1/8
	10	2.70 1/8							2.68 1/8	.02
	17	2.71							2.67 7/8	.03 1/8

Source: The Wall Street Journal

TABLE 2

Weekly Ontario Cash, December and July Futures Prices and Weekly December and July Basis for Corn, 1962 through 1971 Crops (in Canadian Dollars)

	Ontario Cash	December Future Price	July Future Price	December Basis	July Basis
			-- 1962 Crop --		
Oct. 4	1.200	1.134	1.211	0.066	-0.011
11	1.200	1.128	1.209	0.072	-0.009
18	1.200	1.125	1.200	0.075	0.000
25	1.220	1.161	1.230	0.059	-0.020
Nov. 1	1.220	1.149	1.229	0.071	-0.009
8	1.220	1.126	1.215	0.094	0.006
15	1.220	1.138	1.221	0.082	-0.001
22	1.220	1.137	1.227	0.093	-0 .071
29	1.290	1.145	1.231	0.145	0.059
Dec. 6	1.300	1.160	1.235	0.140	0.065
13	1.300	1.187	1.240	0.114	0.060
20	1.340		1.233		0.107
27	1.410		1.239		0.171
1963					
Jan. 1	1.410	1.194	1.250	0.216	0.160
10	1.410	1.199	1.257	0.212	0.156
17	1.410	1.230	1.278	0.181	0.132
24	1.430	1.217	1.262	0.213	0.168
31	1.430	1.226	1.267	0.204	0.163
Feb. 7	1.420	1.223	1.258	0.197	0.162
14	1.420	1.243	1.288	0.177	0.133
21	1.420	1.236	1.288	0.184	0.133
28	1.420	1.244	1.297	0.176	0.123
Mar. 7	1.420	1.242	1.286	0.178	0.131
14	1.420	1.243	1.283	0.177	0.137
21	1.420	1.235	1.288	0.185	0.133
28	1.420	1.235	1.279	0.185	0.141
Apr. 4	1.420	1.225	1.270	0.195	0.150
11	1.420	1.224	1.271	0.196	0.149
18	1.400	1.224	1.286	0.176	0.114
25	1.400	1.246	1.283	0.154	0.117
May 2	1.400	1.240	1.290	0.160	0.111
9	1.410	1.254	1.305	0.156	0.105
16	1.410	1.246	1.309	0.164	0.101
23	1.410	1.235	1.312	0.175	0.098
30	1.410	1.246	1.325	0.164	0.085
June 6	1.420	1.258	1.341	0.162	0.079
13	1.450	1.267	1.367	0.183	0.083
20	1.450	1.257	1.362	0.194	0.084
27	1.490	1.271	1.385	0.219	0.105
July 4	1.510	1.323	1.395	0.187	0.115
11	1.510	1.273	1.402	0.237	0.108
18	1.540	1.240	1.402	0.300	0.138
25	1.540	1.248		0.292	

TABLE 2 cont'd

Date	Ontario Cash	December Future Price	July Future Price	December Basis	July Basis
			-- 1962 Crop --		
Aug. 1	1.540	1.221	1.296	0.319	0.244
8	1.540	1.204	1.286	0.336	0.254
15	1.540	1.217	1.297	0.323	0.243
22	1.560	1.219	1.300	0.341	0.260
29	1.590	1.221	1.301	0.369	0.289
Sept.5	1.590	1.219	1.292	0.371	0.299
12	1.590	1.228	1.305	0.362	0.285
19	1.700	1.247	1.323	0.453	0.377
26	1.700	1.283	1.354	0.417	0.347
			-- 1963 Crop --		
Oct. 3	1.450	1.286	1.348	0.164	0.102
10	1.450	1.308	1.381	0.142	0.070
17	1.330	1.254	1.335	0.076	-0.005
24	1.300	1.266	1.354	0.034	-0.054
31	1.330	1.261	1.356	0.069	-0.026
Nov. 7	1.330	1.279	1.377	0.051	-0.047
14	1.350	1.263	1.360	0.087	-0.010
21	1.340	1.253	1.356	0.088	-0.016
28	1.350	1.257	1.355	0.093	-0.005
Dec. 5	1.350	1.266	1.352	0.084	-0.002
12	1.350	1.278	1.355	0.072	-0.005
19	1.400	1.277	1.352	0.123	0.048
26	1.400		1.351		0.049
1964					
Jan. 1	1.420	1.251	1.325	0.169	0.095
9	1.420	1.292	1.344	0.128	0.076
16	1.420	1.289	1.344	0.131	0.076
23	1.420	1.292	1.348	0.128	0.072
30	1.430	1.282	1.343	0.148	0.087
Feb. 6	1.400	1.286	1.339	0.114	0.061
13	1.400	1.275	1.313	0.125	0.087
20	1.400	1.284	1.320	0.117	0.080
27	1.400	1.297	1.325	0.103	0.075
Mar. 5	1.400	1.308	1.335	0.092	0.065
12	1.400	1.312	1.342	0.088	0.058
19	1.400	1.313	1.339	0.087	0.061
26	1.400	1.284	1.328	0.117	0.072
Apr. 2	1.400	1.293	1.325	0.107	0.075
9	1.400	1.286	1.335	0.114	0.065
16	1.420	1.298	1.343	0.122	0.077
23	1.440	1.278	1.342	0.162	0.098
30	1.440	1.282	1.348	0.158	0.092

TABLE 2 cont'd

	Ontario Cash	December Future Price	July Future Price	December Basis	July Basis
			-- 1963 Crop --		
May 7	1.440	1.278	1.355	0.162	0.085
14	1.440	1.265	1.329	0.175	0.111
21	1.440	1.275	1.344	0.165	0.096
28	1.460	1.269	1.328	0.191	0.132
June 4	1.460	1.281	1.339	0.179	0.121
11	1.460	1.270	1.329	0.190	0.131
18	1.460	1.261	1.328	0.199	0.132
25	1.460	1.261	1.329	0.199	0.131
July 2	1.460	1.257	1.325	0.203	0.135
9	1.460	1.246	1.312	0.214	0.148
16	1.460	1.245	1.302	0.216	0.158
23	1.460	1.243	1.302	0.217	0.158
30	1.470	1.232		0.238	
Aug. 6	1.470	1.261	1.347	0.209	0.123
13	1.470	1.270	1.356	0.200	0.114
20	1.470	1.277	1.358	0.193	0.112
27	1.480	1.317	1.400	0.163	0.081
Sept. 3	1.490	1.358	1.339	0.132	0.151
10	1.520	1.325	1.397	0.195	0.123
17	1.520	1.327	1.402	0.193	0.118
24	1.520	1.311	1.386	0.210	0.134
			-- 1964 Crop --		
Oct. 1	1.400	1.316	1.400	0.084	0.001
8	1.280	1.319	1.397	-0.039	-0.117
15	1.270	1.302	1.382	-0.032	-0.112
22	1.250	1.309	1.400	-0.059	-0.150
29	1.250	1.278	1.373	-0.028	-0.123
Nov. 5	1.250	1.301	1.385	-0.051	-0.135
12	1.250	1.292	1.381	-0.042	-0.131
19	1.230	1.315	1.409	-0.085	-0.179
26	1.240	1.324	1.412	-0.084	-0.172
Dec. 3	1.240	1.312	1.404	-0.072	-0.164
10	1.260	1.316	1.398	-0.056	-0.138
17	1.280	1.331	1.400	-0.051	-0.120
24	1.300		1.303		-0.093
31	1.300		1.394		-0.094
1965					
Jan. 7	1.300	1.268	1.388	0.032	-0.088
14	1.300	1.290	1.395	0.010	-0.095
21	1.320	1.291	1.399	0.029	-0.079
28	1.350	1.304	1.416	0.046	-0.066
Feb. 4	1.400	1.294	1.426	0.106	-0.026
11	1.400	1.303	1.431	0.097	-0.031
18	1.400	1.306	1.420	0.094	-0.020
25	1.380	1.299	1.414	0.081	-0.034

TABLE 2 cont'd

Date	Ontario Cash	December Future Price	July Future Price	December Basis	July Basis
			-- 1964 Crop --		
Mar. 4	1.380	1.309	1.424	0.072	-0.044
11	1.380	1.303	1.434	0.077	-0.054
18	1.400	1.299	1.436	0.101	-0.036
25	1.400	1.296	1.438	0.104	-0.038
Apr. 1	1.400	1.303	1.438	0.097	-0.038
8	1.400	1.304	1.442	0.096	-0.042
15	1.430	1.304	1.445	0.126	-0.015
22	1.430	1.307	1.446	0.123	-0.016
29	1.440	1.309	1.447	0.132	-0.007
May 6	1.440	1.302	1.447	0.138	-0.007
13	1.450	1.303	1.445	0.147	0.006
20	1.480	1.280	1.439	0.200	0.041
27	1.480	1.283	1.523	0.197	-0.043
June 3	1.510	1.277	1.420	0.233	0.090
10	1.500	1.294	1.423	0.206	0.077
17	1.500	1.304	1.423	0.196	0.077
24	1.500	1.303	1.431	0.197	0.069
30	1.510	1.303	1.427	0.207	0.083
July 8	1.510	1.286	1.396	0.225	0.114
15	1.520	1.288	1.393	0.232	0.127
22	1.530	1.294		0.236	
29	1.530	1.292		0.238	
Aug. 5	1.540	1.279	1.362	0.261	0.178
12	1.540	1.267	1.353	0.273	0.187
19	1.540	1.261	1.348	0.279	0.193
26	1.530	1.267	1.353	0.263	0.177
Sept. 2	1.520	1.276	1.366	0.244	0.154
9	1.520	1.267	1.354	0.253	0.166
16	1.520	1.275	1.369	0.245	0.151
23	1.520	1.268	1.362	0.252	0.158
30	1.300	1.256	1.349	0.044	-0.049
			-- 1965 Crop --		
Oct. 7	1.270	1.242	1.3377	0.028	-0.067
14	1.200	1.234	1.3296	-0.034	-0.129
21	1.200	1.241	1.3377	-0.041	-0.137
28	1.200	1.232	1.3296	-0.032	-0.129
Nov. 4	1.200	1.233	1.3296	-0.033	-0.129
11	1.200	1.248	1.3377	-0.048	-0.137
18	1.200	1.253	1.3418	-0.053	-0.141
24	1.250	1.244	1.3418	0.006	-0.091
Dec. 2	1.330	1.302	1.3795	0.028	-0.049
9	1.400	1.323	1.3889	0.088	0.012
16	1.480	1.337	1.3960	0.143	0.084
23	1.480	1.348	1.3889	0.133	0.092
30	1.470		1.3852		0.085

TABLE 2 cont'd

	Ontario Cash	December Future Price	July Future Price	December Basis	July Basis
		-- 1965 Crop --			
Jan. 6	1.480	1.328	1.414	0.152	0.066
13	1.480	1.347	1.438	0.133	0.042
20	1.500	1.328	1.425	0.172	0.075
27	1.500	1.322	1.427	0.178	0.073
Feb. 3	1.500	1.310	1.419	0.190	0.081
10	1.520	1.312	1.425	0.208	0.095
17	1.520	1.309	1.293	0.211	0.227
24	1.520	1.290	1.379	0.230	0.141
Mar. 3	1.490	1.278	1.357	0.212	0.133
10	1.480	1.285	1.363	0.195	0.117
17	1.470	1.277	1.360	0.193	0.110
24	1.450	1.304	1.379	0.147	0.071
31	1.460	1.293	1.360	0.167	0.100
Apr. 7	1.460	1.302	1.374	0.158	0.086
14	1.460	1.304	1.379	0.157	0.081
21	1.460	1.309	1.379	0.151	0.081
28	1.460	1.308	1.367	0.152	0.093
May 5	1.460	1.297	1.362	0.163	0.099
12	1.460	1.298	1.368	0.162	0.092
19	1.480	1.301	1.364	0.179	0.116
26	1.480	1.313	1.363	0.167	0.117
June 2	1.500	1.343	1.368	0.157	0.132
9	1.500	1.344	1.368	0.156	0.132
16	1.500	1.368	1.376	0.132	0.124
23	1.480	1.457	1.442	0.023	0.038
30	1.510	1.495	1.437	0.015	0.073
July 7	1.510	1.465	1.438	0.045	0.072
14	1.520	1.516	1.481	0.004	0.039
21	1.540	1.566		-0.026	
28	1.540	1.550		-0.010	
Aug. 4	1.540	1.554	1.639	-0.014	-0.099
11	1.550	1.593	1.678	-0.043	-0.128
18	1.590	1.635	1.725	-0.045	-0.135
25	1.630	1.605	1.708	0.025	-0.078
Sept. 1	1.650	1.589	1.702	0.061	-0.052
8	1.630	1.580	1.712	0.050	-0.082
15	1.530	1.546	1.663	-0.016	-0.133
22	1.500	1.496	1.594	0.004	-0.094
29	1.440	1.473	1.473	-0.033	-0.031
		-- 1966 Crop --			
Oct. 6	1.440	1.462	1.568	-0.022	-0.128
13	1.420	1.440	1.527	-0.020	-0.107
20	1.380	1.462	1.557	-0.082	-0.177
27	1.380	1.508	1.554	-0.128	-0.174

TABLE 2 cont'd

		Ontario Cash	December Future Price	July Future Price	December Basis	July Basis
				1966 Crop --		
Nov.	3	1.430	1.516	1.619	-0.086	-0.189
	10	1.500	1.503	1.613	-0.003	-0.113
	17	1.500	1.495	1.619	0.005	-0.11.
	23	1.500	1.500	1.615	-0.000	-0.115
Dec.	1	1.540	1.551	1.647	-0.011	-0.107
	8	1.570	1.557	1.635	0.013	-0.065
	15	1.570	1.511	1.603	0.069	-0.023
	22	1.570		1.570		-0.000
	29	1.560		1.576		-0.016
1967						
Jan.	5	1.560	1.437	1.567	0.123	-0.007
	12	1.580	1.432	1.575	0.148	0.005
	19	1.570	1.433	1.551	0.137	0.019
	26	1.550	1.456	1.583	0.094	-0.033
Feb.	2	1.570	1.446	1.574	0.125	-0.004
	9	1.570	1.428	1.540	0.142	0.030
	16	1.570	1.427	1.534	0.143	0.036
	23	1.560	1.466	1.560	0.094	-0.000
Mar.	2	1.550	1.485	1.574	0.065	-0.024
	9	1.550	1.497	1.564	0.053	-0.014
	16	1.550	1.497	1.568	0.053	-0.018
	23	1.550	1.497	1.553	0.053	-0.003
	30	1.550	1.518	1.557	0.032	-0.007
Apr.	6	1.560	1.549	1.579	0.011	-0.019
	13	1.560	1.520	1.526	0.040	0.034
	20	1.560	1.499	1.495	0.061	0.065
	27	1.520	1.454	1.432	0.067	0.088
May	4	1.520	1.472	1.470	0.048	0.050
	11	1.520	1.463	1.456	0.057	0.064
	18	1.540	1.425	1.429	0.115	0.111
	25	1.550	1.447	1.452	0.103	0.098
June	1	1.560	1.455	1.454	0.105	0.107
	8	1.590	1.464	1.344	0.126	0.246
	15	1.560	1.402	1.420	0.158	0.140
	22	1.560	1.459	1.425	0.101	0.135
	29	1.560	1.404	1.406	0.156	0.154
July	6	1.550	1.393	1.416	0.157	0.134
	13	1.550	1.343	1.366	0.207	0.184
	20	1.530	1.336	1.381	0.194	0.149
	27	1.530	1.313		0.217	
Aug.	3	1.500	1.297	1.401	0.203	0.099
	10	1.410	1.277	1.379	0.133	0.031
	17	1.470	1.282	1.393	0.188	0.077
	24	1.480	1.273	1.388	0.207	0.093
	31	1.480	1.265	1.382	0.215	0.098

TABLE 2 cont'd

	Ontario Cash	December Future Price	July Future Price	December Basis	July Basis
			-- 1966 Crop --		
Sept. 7	1.480	1.258	1.363	0.222	0.117
14	1.500	1.253	1.359	0.247	0.141
21	1.450	1.239	1.365	0.211	0.085
28	1.430	1.231	1.342	0.199	0.088
			-- 1967 Crop --		
Oct. 5	1.360	1.237	1.353	0.124	0.008
12	1.250	1.226	1.344	0.024	-0.094
19	1.250	1.224	1.348	0.026	-0.098
26	1.250	1.237	1.358	0.014	-0.108
Nov. 2	1.250	1.234	1.340	0.016	-0.090
9	1.230	1.211	1.330	0.019	-0.100
16	1.230	1.211	1.320	0.019	-0.090
23	1.250	1.227	1.326	0.023	-0.076
30	1.250	1.230	1.339	0.020	-0.089
Dec. 7	1.220	1.239	1.357	-0.019	-0.137
14	1.250	1.243	1.362	0.007	-0.112
21	1.260		1.365		-0.105
28	1.260		1.355		-0.095
1968					
Jan. 4	1.280	1.352	1.354	-0.072	-0.074
11	1.280	1.355	1.355	-0.075	-0.075
18	1.280	1.360	1.363	-0.080	-0.083
25	1.280	1.359	1.360	-0.079	-0.080
31	1.290	1.377	1.362	-0.087	-0.072
Feb. 7	1.310	1.390	1.366	-0.080	-0.056
15	1.300	1.394	1.363	-0.094	-0.063
22	1.280	1.386	1.352	-0.106	-0.072
29	1.250	1.379	1.352	-0.129	-0.102
Mar. 7	1.250	1.374	1.350	-0.124	-0.100
14	1.250	1.386	1.362	-0.136	-0.112
21	1.270	1.382	1.350	-0.112	-0.080
28	1.270	1.375	1.344	-0.105	-0.074
Apr. 4	1.260	1.339	1.309	-0.079	-0.049
11	1.250	1.320	1.286	-0.070	-0.036
18	1.240	1.313	1.289	-0.073	-0.049
25	1.240	1.303	1.273	-0.063	-0.033
May 2	1.230	1.296	1.262	-0.066	-0.032
9	1.230	1.311	1.277	-0.081	-0.047
16	1.240	1.293	1.262	-0.053	-0.022
23	1.240	1.288	1.250	-0.048	-0.010
29	1.240	1.292	1.250	-0.052	-0.010
June 6	1.250	1.293	1.246	-0.043	0.004
13	1.260	1.285	1.239	-0.025	0.021
20	1.270	1.255	1.216	0.015	0.054
27	1.280	1.234	1.207	0.046	0.073

TABLE 2 cont'd

	Ontario Cash	December Future Price	July Future Price	December Basis	July Basis
			-- 1967 Crop --		
July 3	1.290	1.215	1.193	0.075	0.097
11	1.290	1.201	1.189	0.089	0.101
18	1.310	1.193	1.185	0.117	0.125
25	1.310	1.162		0.148	
Aug. 1	1.310	1.152	1.255	0.158	0.055
8	1.310	1.134	1.242	0.176	0.168
15	1.320	1.122	1.239	0.198	0.081
22	1.320	1.129	1.191	0.191	0.129
29	1.320	1.118	1.632	0.202	-0.312
Sept.5	1.320	1.109	1.231	0.212	0.089
12	1.320	1.109	1.223	0.212	0.097
19	1.300	1.109	1.226	0.192	0.074
26	1.230	1.156	1.226	0.074	0.004
			-- 1968 Crop --		
Oct. 3	1.120	1.099	1.215	0.021	-0.095
10	1.090	1.117	1.235	-0.027	-0.145
17	1.070	1.160	1.274	-0.190	-0.204
24	1.050	1.180	1.290	-0.130	-0.240
30	1.070	1.193	1.301	-0.123	-0.231
Nov. 7	1.090	1.250	1.325	-0.160	-0.235
14	1.140	1.257	1.348	-0.117	-0.208
21	1.150	1.242	1.338	-0 092	-0.188
27	1.160	1.254	1.340	-0.094	-0.180
Dec. 5	1.200	1.215	1.323	-0.015	-0.123
12	1.230	1.234	1.340	-0.004	-0.110
19	1.230	1.242	1.331	-0.012	-0.101
26	1.240		1.329		-0.089
1969					
Jan. 2	1.240	1.275	1.326	-0.035	-0.086
9	1.270	1.275	1.338	-0.005	-0.068
16	1.280	1.260	1.334	0.021	-0.054
23	1.270	1.252	1.325	0.018	-0.055
30	1.270	1.257	1.330	0.013	-0.060
Feb. 6	1.270	1.253	1.322	0.017	-0.052
13	1.260	1.252	1.315	0.008	-0.055
20	1.250	1.244	1.311	0.006	-0.061
27	1.250	1.241	1.299	0.009	-0.049
Mar. 6	1.250	1.240	1.304	0.010	-0.054
13	1.250	1.233	1.298	0.017	-0.049
20	1.250	1.228	1.276	0.022	-0.026
27	1.250	1.225	1.275	0.025	-0.025
Apr. 3	1.250	1.236	1.280	0.014	-0.030
10	1.250	1.259	1.298	-0.009	-0.049
17	1.260	1.272	1.316	-0.013	-0.056
24	1.270	1.269	1.319	0.001	-0.049

TABLE 2 cont'd

Date	Ontario Cash	December Future Price	July Future Price	December Basis	July Basis
			-- 1968 Crop --		
May 1	1.300	1.319	1.364	-0.019	-0.064
8	1.350	1.335	1.389	0.015	-0.039
15	1.390	1.335	1.391	0.055	-0.001
22	1.480	1.368	1.400	0.113	0.080
29	1.480	1.337	1.374	0.143	0.106
June 5	1.480	1.339	1.397	0.141	0.083
12	1.550	1.327	1.376	0.223	0.174
19	1.550	1.331	1.381	0.219	0.169
26	1.560	1.330	1.365	0.230	0.195
July 3	1.560	1.342	1.360	0.218	0.201
10	1.560	1.360	1.378	0.201	0.182
17	1.560	1.351	1.392	0.209	0.168
24	1.550	1.321		0.230	
31	1.520	1.261		0.259	
Aug. 7	1.520	1.242	1.358	0.278	0.172
14	1.520	1.259	1.373	0.261	0.147
21	1.540	1.234	1.343	0.306	0.197
28	1.530	1.263	1.372	0.268	0.157
Sept. 4	1.530	1.261	1.374	0.269	0.156
11	1.530	1.257	1.367	0.273	0.163
18	1.400	1.253	1.362	0.147	0.038
25	1.300	1.249	1.367	0.051	-0.068
			-- 1969 Crop --		
Oct. 2	1.250	1.255	1.373	-0.005	-0.123
9	1.250	1.273	1.397	-0.023	-0.147
16	1.230	1.292	1.403	-0.062	-0.173
23	1.230	1.284	1.401	-0.054	-0.171
29	1.260	1.281	1.393	-0.021	-0.133
Nov. 6	1.270	1.261	1.368	0.009	-0.098
13	1.260	1.294	1.395	-0.034	-0.135
20	1.260	1.284	1.384	-0.024	-0.124
26	1.260	1.283	1.377	-0.023	-0.117
Dec. 4	1.270	1.275	1.378	-0.005	-0.108
11	1.270	1.267	1.370	0.003	-0.100
18	1.280	1.271	1.368	0.009	-0.088
24	1.280		1.362		-0.082
1970					
Jan. 1	1.290	1.282	1.357	0.008	-0.067
8	1.300	1.281	1.356	0.019	-0.056
15	1.300	1.271	1.352	0.029	-0.052
22	1.300	1.274	1.349	0.026	-0.049
29	1.310	1.265	1.332	0.045	-0.022
Feb. 5	1.310	1.254	1.320	0.056	-0.010
12	1.320	1.260	1.325	0.060	-0.005
19	1.330	1.261	1.347	0.069	-0.017
26	1.330	1.266	1.328	0.064	0.002

TABLE 2 cont'd

	Ontario Cash	December Future Price	July Future Price	December Basis	July Basis
		-- 1969 Crop --			
Mar. 5	1.330	1.260	1.336	0.070	-0.006
12	1.330		1.247	1.326	0.004
19	1.330	1.258	1.325	0.072	0.005
26	1.330	1.263	1.334	0.067	-0.004
Apr. 2	1.320	1.266	1.336	0.054	-0.016
9	1.320	1.273	1.349	0.047	-0.029
16	1.320	1.285	1.361	0.035	-0.041
23	1.330	1.290	1.369	0.040	-0.039
30	1.360	1.320	1.385	0.041	-0.025
May 7	1 360	1.301	1.380	0.059	-0.020
14	1.410	1.304	1.388	0.107	0.022
21	1.410	1.305	1.389	0.105	0.021
28	1.410	1.306	1.385	0.104	0.025
June 4	1.410	1.282	1.360	0.128	0.050
11	1.400	1.311	1.369	0.089	0.031
18	1.400	1.315	1.379	0.085	0.022
25	1.400	1.362	1.412	0.038	-0.012
July 2	1.420	1.375	1.410	0.045	0.010
9	1.420	1.384	1.415	0.036	0.005
16	1.420	1.349	1.409	0.071	0.011
23	1.420	1.342		0.078	
30	1.420	1.298	1.391	0.122	0.029
Aug. 6	1.390	1.319	1.316	0.071	0.074
13	1.360	1.426	1.514	-0.066	-0.154
20	1.380	1.565	1.637	-0.185	-0.257
27	1.420	1.558	1.629	-0.138	-0.209
Sept. 3	1.460	1.544	0.605	-0.084	-0.145
10	1.460	1.553	1.620	-0.093	-0.160
17	1.440	1.544	1.615	-0.104	-0.175
24	1.390	1.538	1.628	-0.148	-0.238
		-- 1970 Crop --			
Oct. 1	1.360	1.524	1.624	-0.164	-0.264
8	1.340	1.553	1.655	-0.213	-0.315
15	1.310	1.518	1.619	-0.209	-0.309
22	1.280	1.496	1.604	-0.216	-0.324
29	1.280	1.479	1.591	-0.199	-0.311
Nov. 5	1.290	1.545	1.656	-0.255	-0.366
12	1.290	1.505	1.624	-0.215	-0.334
19	1.290	1.479	1.594	-0.189	-0.304
26	1.300	1.479	1.593	-0.179	-0.293
Dec. 3	1.330	1.524	1.625	-0.194	-0.295
10	1.330	1 502	1.586	-0.172	-0.256
17	1.400	1.527	1.624	-0.127	-0.224
24	1.410		1.613		-0.203
31	1.440	1.5744	1.622	-0.134	-0.182

TABLE 2 cont'd

	Ontario Cash	December Future Price	July Future Price	December Basis	July Basis
			-- 1970 Crop --		
1971					
Jan. 7	1.460	1.598	1.624	-0.138	-0.164
14	1.470	1.598	1.640	-0.128	-0.170
21	1.510	1.600	1.638	-0.089	-0.128
28	1.490	1.552	1.597	-0.062	-0.107
Feb. 4	1.500	1.543	1.589	-0.043	-0.089
11	1.490	1.555	1.582	-0.065	-0.092
18	1.480	1.542	1.579	-0.062	-0.099
25	1.460	1.535	1.555	-0.075	-0.095
Mar. 6	1.480	1.555	1.576	-0.075	-0.096
11	1.480	1.531	1.554	-0.051	-0.074
18	1.440	1.483	1.518	-0.043	-0.078
25	1.420	1.469	1.509	-0.049	-0.089
Apr. 1	1.410	1.457	1.494	-0.047	-0.084
8	1.400	1.446	1.489	-0.046	-0.089
15	1.400	1.450	1.496	-0.050	-0.096
22	1.400	1.411	1.456	-0.011	-0.056
29	1.380	1.413	1.455	-0.033	-0.075
May 6	1.370	1.383	1.451	-0.013	-0.081
13	1.360	1.386	1.464	-0.026	-0.104
20	1.360	1.395	1.459	-0.035	-0.099
27	1.360	1.473	1.513	-0.113	-0.153
June 3	1.390	1.508	1.540	-0.118	-0.150
10	1.420	1.643	1.631	-0.223	-0.211
17	1.440	1.619	1.624	-0.179	-0.184
24	1.460	1.584	1.608	-0.124	-0.148
July 1	1.450	1.601	1.616	-0.151	-0.166
8	1.420	1.450	1.501	-0.030	-0.081
15	1.420	1.458	1.533	-0.038	-0.113
22	1.420	1.376		0.044	
29	1.390	1.325	1.424	0.065	-0.034
Aug. 5	1.390	1.224	1.327	0.166	0.063
12	1.290	1.263	1.368	0.027	-0.078
19	1.280	1.239	1.340	0.041	-0.060
26	1.280	1.200	1.277	0.081	0.003
Sept. 2	1.280	1.236	1.335	0.044	-0.055
9	1.280	1.195	1.294	0.085	-0.014
16	1.250	1.151	1.252	0.099	-0.002
23	1.250	1.145	1.247	0.075	-0.027
			-- 1971 Crop --		
Oct. 1	1.100	1.138	1.235	-0.038	-0.135
7	1.050	1.145	1.246	-0.095	-0.196
14	1.040	1.165	1.266	-0.125	-0.226
21	1.010	1.190	1.283	-0.180	-0.273
28	1.010	1.161	1.283	-0.151	-0.273

TABLE 2 cont'd

Date	Ontario Cash	December Future Price	July Future Price	December Basis	July Basis
			-- 1971 Crop --		
Nov. 4	1.020	1.1678	1.256	-0.147	-0.236
11	1.050	1.158	1.257	-0.108	-0.207
18	1.080	1.152	1.252	-0.072	-0.172
25	1.090	1.162	1.264	-0.072	-0.174
Dec. 2	1.150	1.179	1.284	-0.029	-0.134
9	1.190	1.182	1.294	0.008	-0.104
16	1.200	1.189	1.292	0.011	-0.092
23	1.200		1.282		-0.082
30	1.220	1.274	1.288	-0.054	-0.068
1972					
Jan 6	1.220	1.271	1.284	-0.051	-0.064
13	1.210	1.263	1.273	-0.053	-0.063
20	1.180	1.268	1.278	-0.088	-0.098
27	1.180	1.257	1.269	-0.077	-0.089
Feb. 3	1.170	1.218	1.282	-0.048	-0.112
10	1.140	1.247	1.271	-0.107	-0.131
17	1.150	1.247	1.267	-0.097	-0.117
24	1.150	1.255	1.260	-0.105	-0.110
Mar. 2	1.140	1.257	1.266	-0.117	-0.126
9	1.140	1.276	1.244	-0.136	-0.104
16	1.150	1.271	1.273	-0.121	-0.123
23	1.150	1.279	1.281	-0.129	-0.131
30	1.160	1.273	1.279	-0.113	-0.119
Apr. 6	1.160	1.284	1.284	-0.124	-0.124
13	1.170	1.296	1.289	-0.126	-0.119
20	1.180	1.296	1.274	-0.116	-0.094
28	1.190	1.276	1.261	-0.086	-0.071
May 4	1.190	1.193	1.250	-0.003	-0.060
11	1.210	1.272	1.217	-0.062	-0.007
18	1.210	1.261	1.255	-0.051	-0.045
25	1.210	1.258	1.259	-0.048	-0.049
June 1	1.220	1.229	1.230	-0.009	-0.010
8	1.220	1.227	1.216	-0.007	0.004
15	1.230	1.199	1.194	0.031	0.036
22	1.190	1.195	1.178	-0.005	-0.012
29	1.190	1.184	1.155	0.006	0.036

TABLE 3

Weekly Ontario Cash November and July Futures Prices
and Weekly November and July Basis for Soybeans
1962 through 1971 Crops
(in Canadian Dollars)

Date	Ontario Cash	November Future Price	July Future Price	November Basis	July Basis
			-- 1962 Crop --		
Oct. 4	2.695	2.562	2.661	0.132	0.033
11	2.650	2.534	2.640	0.115	0.009
18	2.662	2.548	2.637	0.114	0.025
25	2.700	2.588	2.669	0.111	0.030
Nov. 1	2.700	2.588	2.656	0.111	0.043
8	2.702	2.566	2.641	0.135	0.060
15	2.747	2.606	2.685	0.140	0.061
22	2.562		2.691	2.562	-0.128
29	2.555		2.687	2.555	-0.132
Dec. 6	2.552	2.527	2.682	0.024	-0.130
13	2.565	2.565	2.700	-0.000	-0.135
20	2.577	2.562	2.687	0.014	-0.109
27	2.567	2.573	2.691	-0.005	-0.123
1963					
Jan. 3	2.575	2.599	2.724	-0.024	-0.149
10	2.595	2.606	2.739	-0.011	-0.144
17	2.705	2.635	2.833	0.069	-0.128
24	2.757	2.669	2.868	0.088	-0.111
31	2.805	2.674	2.938	0.130	-0.133
Feb. 7	2.722	2.672	2.860	0.050	-0.138
14	2.760	2.688	2.876	0.071	-0.116
21	2.755	2.695	2.874	0.060	-0.119
8	2.772	2.711	2.890	0.061	-0.117
Mar. 7	2.752	2.707	2.871	0.045	-0.119
14	2.717	2.701	2.827	0.015	-0.109
21	2.662	2.636	2.773	0.025	-0.110
28	2.682	2.661	2.804	0.021	-0.121
Apr. 4	2.675	2.631	2.777	0.043	-0.102
11	2.670	2.645	2.781	0.025	-0.111
18	2.647	2.686	2.781	-0.039	-0.133
25	2.660	2.693	2.821	-0.033	-0.161
May 2	2.687	2.684	2.804	0.003	-0.116
9	2.735	2.740	2.848	-0.005	-0.113
16	2.700	2.703	2.814	-0.003	-0.114
23	2.760	2.725	2.813	0.034	-0.053
30	2.732	2.700	2.783	0.032	-0.051
June 6	2.742	2.727	2.810	0.015	-0.068
13	2.840	2.782	2.847	0.057	-0.007
20	2.842	2.777	2.849	0.065	-0.007
27	2.847	2.823	2.855	0.024	-0.007
July 4	2.900	2.911	2.906	-0.011	-0.006
11	2.850	2.859	2.851	-0.009	-0.001
18	2.792	2.783	2.797	0.008	-0.004
25	2.850	2.831		0.018	2.850

TABLE 3 cont'd

Date	Ontario Cash	November Future Price	July Future Price	November Basis	July Basis
		-- 1962 Crop --			
Aug. 1	2.792	2.770	2.876	0.022	-0.084
8	2.795	2.774	2.870	0.020	-0.075
15	2.770	2.732	2.839	0.037	-0.069
22	2.762	2.732	2.839	0.029	-0.076
29	2.722	2.748	2.859	-0.026	-0.136
Sept.5	2.687	2.727	2.840	-0.039	-0.153
12	2.750	2.793	2.909	-0.043	-0.159
19	2.775	2.839	2.955	-0.064	-0.180
26	2.940	2.933	3.044	0.006	-0.104
		-- 1963 Crop --			
Oct. 3	2.912	2.965	3.098	-0.053	-0.185
10	3.035	3.098	3.213	-0.063	-0.178
17	2.862	2.917	3.038	-0.054	-0.176
24	2.865	2.917	3.044	-0.052	-0.179
30	3.042	3.027	3.192	0.014	-0.149
Nov. 7	3.037	3.095	3.235	-0.057	-0.198
14	3.020	3.044	3.181	-0.024	-0.161
21	2.872		3.019	2.872	-0.147
28	2.862		3.000	2.862	-0.138
Dec. 5	2.817	2.720	2.938	0.097	-0.121
12	2.897	2.766	3.036	0.131	-0.138
19	2.892	2.852	3.137	0.039	-0.244
26	2.990	2.761	3.160	0.229	-0.170
1964					
Jan. 2	2.925	2.753	3.092	0.171	-0.167
9	2.945	2.790	3.090	0.154	-0.145
16	2.917	2.793	3.067	0.123	-0.149
23	2.882	2.761	3.003	0.121	-0.121
30	2.837	2.777	2.925	0.060	-0.088
Feb. 6	2.842	2.773	2.914	0.069	-0.072
13	2.810	2.774	2.885	0.035	-0.075
20	2.802	2.741	2.874	0.061	-0.072
27	2.798	2.739	2.867	0.059	-0.069
Mar. 5	2.855	2.730	2.888	0.124	-0.033
12	2.817	2.716	2.850	0.100	-0.032
19	2.705	2.708	2.803	0.003	-0.098
26	2.705	2.653	2.778	0.051	-0.073
Apr. 4	2.707	2.669	2.778	0.038	-0.071
9	2.687	2.615	2.747	0.071	-0.060
16	2.692	2.612	2.736	0.079	-0.044
23	2.662	2.604	2.701	0.057	-0.039
30	2.657	2.604	2.714	0.052	-0.056
May 7	2.660	2.606	2.711	0.053	-0.051
14	2.582	2.577	2.662	0.004	-0.080
21	2.677	2.617	2.695	0.060	-0.017
28	2.660	2.607	2.676	0.052	-0.016

TABLE 3 cont'd

Date	Ontario Cash	November Future Price	July Future Price	November Basis	July Basis
		— 1963 Crop —			
June 4	2.690	2.625	2.707	0.064	-0.017
11	2.672	2.608	2.688	0.063	-0.015
18	2.665	2.600	2.681	0.064	-0.016
25	2.670	2.618	2.687	0.051	-0.017
July 2	2.672	2.629	2.687	0.043	-0.014
9	2.657	2.617	2.668	0.040	-0.010
16	2.650	2.585	2.685	0.064	-0.035
23	2.652	2.579		0.073	2.652
30	2.650	2.584		0.065	2.650
Aug. 6	2.661	2.648	2.766	0.013	-0.105
13	2.667	2.653	2.766	0.014	-0.099
20	2.642	2.684	2.792	-0.041	-0.149
27	2.691	2.743	2.857	-0.052	-0.165
Sept.3	2.693	2.762	2.869	-0.068	-0.175
10	2.696	2.763	2.862	-0.067	-0.166
17	2.897	2.985	3.079	-0.087	-0.181
24	2.895	2.925	3.025	-0.030	-0.130
		— 1964 Crop —			
Oct. 1	2.930	2.968	3.055	-0.038	-0.125
8	2.960	3.001	3.063	-0.041	-0.103
15	2.882	2.917	2.995	-0.035	-0.113
22	2.890	2.924	3.009	-0.034	-0.119
27	2.830	2.855	2.951	-0.025	-0.121
Nov. 5	2.917	2.952	3.055	-0.035	-0.137
12	2.920	2.955	3.041	-0.035	-0.121
19	3.045		3.107	3.045	-0.062
26	3.120	2.742	3.195	0.377	-0.075
Dec. 3	2.985	2.745	3.176	0.240	-0.191
10	2.992	2.747	3.163	0.244	-0.170
17	3.055	2.763	3.171	0.291	-0.116
24	2.995	2.747	3.169	0.247	-0.174
31	2.912	2.708	3.063	0.203	-0.150
1965					
Jan. 7	2.930	2.727	3.093	0.202	-0.163
14	3.011	2.740	3.182	0.270	-0.171
21	3.070	2.719	3.244	0.350	-0.174
28	3.160	2.751	3.349	0.408	-0.189
Feb. 4	3.195	2.746	3.393	0.448	-0.198
11	3.122	2.743	3.333	0.379	-0.211
18	3.095	2.765	3.282	0.329	-0.187
25	3.106	2.766	3.306	0.339	-0.200
Mar. 4	3.122	2.767	3.325	0.354	-0.203
11	3.120	2.751	3.322	0.368	-0.202
18	2.985	2.759	3.190	0.225	-0.205
25	3.035	2.762	3.225	0.272	-0.190

TABLE 3 cont'd

Date	Ontario Cash	November Future Price	July Future Price	November Basis	July Basis
		-- 1964 Crop --			
Apr. 1	3.105	2.770	3.298	0.334	-0.193
8	3.110	2.779	3.309	0.330	-0.199
15	3.072	2.782	3.260	0.289	-0.188
22	3.045	2.781	3.240	0.263	-0.195
29	2.922	2.743	3.126	0.179	-0.203
May 6	2.902	2.699	3.075	0.203	-0.172
13	2.872	2.681	3.064	0.191	-0.191
20	2.845	2.660	3.010	0.185	-0.165
27	2.882	2.647	3.056	0.234	-0.173
June 3	2.925	2.656	3.096	0.269	-0.171
10	2.952	2.678	3.127	0.273	-0.175
17	2.927	2.657	3.103	0.270	-0.175
24	3.035	2.678	3.215	0.356	-0.180
30	2.992	2.684	3.169	0.308	-0.176
July 8	2.907	2.650	3.083	0.256	-0.175
15	2.930	2.639	3.101	0.290	-0.171
22	2.982	2.697		0.284	2.982
29	2.960	2.691		0.269	2.960
Aug. 5	2.947	2.657	2.771	0.290	0.175
12	2.902	2.661	2.783	0.241	0.118
19	2.955	2.649	2.767	0.305	0.187
26	2.942	2.654	2.770	0.287	0.172
Sept.2	2.915	2.657	2.774	0.257	0.140
9	2.907	2.649	2.765	0.258	0.142
16	2.945	2.686	2.805	0.258	0.139
23	2.952	2.697	2.808	0.254	0.144
30	2.927	2.669	2.789	0.258	0.138
		-- 1965 Crop --			
Oct. 7	2.657	2.647	2.777	0.009	-0.119
14	2.662	2.656	2.778	0.006	-0.116
21	2.665	2.678	2.788	-0.013	-0.123
28	2.645	2.676	2.778	-0.031	-0.133
Nov. 4	2.655	2.682	2.797	-0.027	-0.142
11	2.640	2.704	2.819	-0.064	-0.179
18	2.690	2.750	2.829	-0.060	-0.139
24	2.592		2.808	2.592	-0.215
Dec. 2	2.672	2.740	2.903	-0.068	-0.231
9	2.680	2.767	2.905	-0.087	-0.225
16	2.692	2.779	2.926	-0.087	-0.234
23	2.695	2.789	2.934	-0.094	-0.239
30	2.685	2.781	2.920	-0.096	-0.235
1966					
Jan. 6	2.780	2.825	3.009	-0.045	-0.229
13	2.897	2.844	3.105	0.053	-0.207
20	2.997	2.871	3.145	0.126	-0.148
27	2.840	2.862	3.090	-0.022	-0.250

TABLE 3 cont'd

Date	Ontario Cash	November Future Price	July Future Price	November Basis	July Basis
		— 1965 Crop —			
Feb. 3	2.952	2.862	3.097	0.089	-0.144
10	3.035	2.881	3.187	0.153	-0.152
17	3.022	2.888	3.175	0.133	-0.152
24	2.940	2.884	3.091	0.055	-0.151
Mar. 3	2.915	2.895	3,070	0.019	-0.155
10	2.932	2.902	3.093	0.030	-0.160
17	2.920	2.873	3.071	0.046	-0.151
24	2.977	2.894	3.139	0.083	-0.161
31	2.922	2.896	3.078	0.025	-0.155
Apr. 7	2.987	2.976	3.152	0.011	-0.165
14	3.007	2.992	3.182	0.015	-0.174
21	3.037	3.009	3.218	0.027	-0.180
28	3.125	3.043	3.320	0.081	-0.195
May 5	3.160	3.024	3.291	0.135	-0.131
12	3.190	3.013	3.297	0.176	-0.107
19	3.230	2.990	3.296	0.239	-0.066
26	3.280	3.004	3.366	0.275	-0.086
June 6	3.345	3.074	3.432	0.270	-0.087
9	3.307	3.044	3.396	0.262	-0.088
16	3.482	3.113	3.584	0.369	-0.102
23	3.662	3.218	3.773	0.444	-0.110
30	3.860	3.369	3.980	0.490	-0.120
July 7	3.723	3.253	3.843	0.470	-0.119
14	3.662	3.485	3.774	0.177	-0.112
21	3.570	3.470		0.099	3.570
28	3.525	3.417		0.107	3.525
Aug. 4	3.637	3.458	3.565	0.179	0.071
11	3.840	3.522	3.644	0.317	0.196
18	4.022	3.495	3.618	0.526	0.404
25	3.857	3.439	3.565	0.418	0.291
Sept.1	3.427	3.442	3.584	-0.014	-0.157
8	3.315	3.446	3.622	-0.131	-0.307
15	3.245	3.301	3.474	-0.056	-0.229
22	3.177	3.230	3.390	-0.053	-0.213
29	3.137	3.183	3.354	-0.045	-0.217
		-- 1966 Crop —			
Oct. 6	3.080	3.126	3.277	-0.046	-0.197
13	3.060	3.134	3.248	-0.074	-0.188
20	3.160	3.210	3.312	-0.050	-0.152
27	3.080	3.124	3.253	-0.044	-0.173
Nov. 3	3.115	3.160	3.266	-0.045	-0.151
10	3.112	3.139	3.206	-0.026	-0.093
17	3.212	3.269	3.213	-0.057	-0.000
23	3.050		3.226	3.050	-0.176
Dec. 1	3.050	3.059	3.218	-0.009	-0.168
8	3.050	3.056	3.205	-0.006	-0.155
15	3.030	3.095	3.196	-0.065	-0.166
22	3.022	3.089	3.178	-0.066	-0.155
29	2.990	3.023	3.129	-0.033	-0.139

TABLE 3 cont'd

Date	Ontario Cash	November Future Price	July Future Price	November Basis	July Basis
1967					
Jan. 5	2.980	3.029	3.121	-0.049	-0.141
12	2.970	3.016	3.113	-0.046	-0.143
19	2.952	3.001	3.100	-0.049	-0.147
26	2.960	2.998	3.104	-0.038	-0.144
Feb. 2	2.962	2.998	3.097	-0.036	-0.134
9	2.932	2.988	3.067	-0.055	-0.135
16	2.935	2.974	3.066	-0.039	-0.131
23	2.942	2.985	3.077	-0.042	-0.134
Mar. 2	2.960	3.028	3.122	-0.068	-0.162
9	2.955	3.020	3.110	-0.065	-0.155
16	2.967	3.044	3.218	-0.077	-0.251
23	2.935	3.002	3.090	-0.067	-0.155
30	2.932	3.020	3.090	-0.087	-0.158
Apr. 6	2.937	3.017	3.090	-0.080	-0.153
13	2.922	2.998	3.075	-0.076	-0.153
20	2.932	3.002	3.077	-0.070	-0.144
27	2.877	2.982	3.036	-0.105	-0.159
May 4	2.877	2.977	3.035	-0.099	-0.157
11	2.907	2.982	3.052	-0.075	-0.145
18	2.890	2.986	3.050	-0.096	-0.160
25	3.050	3.028	3.073	-0.021	-0.023
June 1	3.055	3.039	3.078	0.015	-0.023
8	3.057	3.040	3.082	0.016	-0.024
15	3.062	2.967	3.085	0.094	-0.022
22	3.055	2.967	3.079	0.087	-0.024
29	3.017	2.982	3.039	0.034	-0.021
July 6	3.045	2.916	3.068	0.128	-0.023
13	3.045	2.915	3.070	0.129	-0.025
20	2.997	2.904	3.012	0.093	-0.014
27	2.977	2.897		0.079	2.977
Aug. 3	2.982	2.892	3.009	0.090	-0.027
10	2.942	2.869	2.989	0.073	-0.046
17	2.995	2.896	3.011	0.098	-0.016
24	3.027	2.895	3.005	0.132	0.021
31	3.032	2.895	2.994	0.137	0.037
Sept.7	2.990	2.888	2.988	0.101	0.002
14	2.997	2.888	2.989	0.109	0.008
21	3.007	2.885	2.982	0.122	0.024
28	2.967	2.843	2.939	0.123	0.028
		-- 1967 Crop --			
Oct. 5	2.805	2.854	2.969	-0.049	-0.164
12	2.797	2.843	2.958	-0.046	-0.160
19	2.792	2.838	2.950	-0.045	-0.157
26	2.797	2.846	2.974	-0.049	-0.177
Nov. 2	2.797	2.845	2.961	-0.047	-0.163
9	2.805	2.851	2.990	-0.046	-0.185
16	2.720	2.851	2.985	-0.131	-0.265
23	2.710		2.978	2.710	-0.268
30	2.737		2.985	2.737	-0.247

TABLE 3 cont'd

Date	Ontario Cash	November Future Price	July Future Price	November Basis	July Basis
		-- 1967 Crop --			
Dec. 7	2.740	2.916	2.981	-0.176	-0.241
14	2.720	2.903	2.986	-0.183	-0.266
21	2.725	2.901	2.992	-0.176	-0.267
28	2.722	2.876	3.002	-0.153	-0.280
1968					
Jan. 4	2.717	2.901	2.983	-0.183	-0.265
11	2.742	2.901	2.996	-0.158	-0.254
18	2.757	2.906	3.011	-0.149	-0.254
25	2.755	2.910	3.015	-0.155	-0.260
31	2.755	2.934	3.014	-0.179	-0.259
Feb. 7	2.747	2.926	3.004	-0.179	-0.257
15	2.747	2.928	3.008	-0.180	-0.261
22	2.745	2.922	3.004	-0.177	-0.259
29	2.732	2.920	3.003	-0.187	-0.271
Mar. 7	2.737	2.930	3.014	-0.193	-0.276
14	2.747	2.937	3.025	-0.190	-0.277
21	2.740	2.890	2.986	-0.150	-0.246
28	2.735	2.885	2.980	-0.150	-0.245
Apr. 4	2.707	2.859	2.952	-0.152	-0.244
11	2.717	2.852	2.960	-0.135	-0.242
18	2.712	2.844	2.952	-0.132	-0.239
25	2.712	2.841	2.953	-0.129	-0.241
May 2	2.710	2.831	2.947	-0.121	-0.237
9	2.717	2.835	2.951	-0.117	-0.233
16	2.735	2.827	2.945	-0.092	-0.210
23	2.737	2.835	2.937	-0.097	-0.200
27	2.720	2.829	2.924	-0.109	-0.204
June 6	2.727	2.821	2.928	-0.094	-0.200
13	2.710	2.806	2.909	-0.096	-0.199
20	2.662	2.771	2.858	-0.109	-0.195
27	2.670	2.757	2.866	-0.087	-0.196
July 3	2.667	2.739	2.863	-0.072	-0.196
11	2.672	2.739	2.870	-0.067	-0.197
18	2.705	2.747	2.903	-0.042	-0.198
25	2.715	2.744		-0.029	2.715
Aug. 1	2.715	2.732	2.832	-0.017	-0.117
8	2.712	2.715	2.804	-0.002	-0.091
15	2.710	2.720	2.825	-0.010	-0.115
22	2.665	2.740	2.836	-0.075	-0.171
29	2.680	2.742	2.840	-0.062	-0.160
Sept.5	2.667	2.740	2.847	-0.073	-0.179
12	2.642	2.734	2.833	-0.091	-0.191
19	2.597	2.744	2.844	-0.147	-0.247
26	2.570	2.715	2.812	-0.145	-0.242

TABLE 3 cont'd

Date	Ontario Cash	November Future Price	July Future Price	November Basis	July Basis
		-- 1968 Crop --			
Oct. 3	2.507	2.703	2.753	-0.195	-0.245
10	2.505	2.700	2.809	-0.195	-0.304
17	2.515	2.709	2.837	-0.194	-0.322
24	2.507	2.700	2.839	-0.193	-0.331
30	2.522	2.719	2.855	-0.196	-0.332
Nov. 7	2.550	2.747	2.882	-0.197	-0.332
14	2.560	2.759	2.883	-0.199	-0.323
21	2.560		2.876	2.560	-0.316
27	2.575		2.876	2.575	-0.301
Dec. 5	2.550	2.587	2.852	-0.037	-0.302
12	2.565	2.602	2.868	-0.037	-0.303
19	2.580	2.604	2.868	-0.024	-0.288
26	2.580	2.612	2.874	-0.032	-0.294
1969					
Jan. 2	2.580	2.613	2.864	-0.033	-0.284
9	2.580	2.613	2.877	-0.033	-0.297
16	2.587	2.608	2.885	-0.021	-0.298
30	2.620	2.603	2.903	0.016	-0.283
Feb. 6	2.610	2.605	2.885	0.004	-0.275
13	2.610	2.596	2.893	0.013	-0.283
20	2.605	2.581	2.899	0.023	-0.294
29	2.595	2.573	2.893	0.021	-0.298
Mar. 6	2.562	2.557	2.876	0.005	-0.314
13	2.557	2.533	2.883	0.044	-0.305
20	2.615	2.517	2.873	0.098	-0.258
27	2.605	2.529	2.864	0.075	-0.259
Apr. 3	2.597	2.525	2.860	0.072	-0.262
10	2.622	2.535	2.892	0.086	-0.270
17	2.635	2.535	2.902	0.099	-0.267
24	2.642	2.533	2.906	0.109	-0.263
May 1	2.635	2.542	2.910	0.092	-0.275
8	2.645	2.549	2.918	0.095	-0.273
15	2.650	2.558	2.916	0.091	-0.266
22	2.662	2.557	2.889	0.105	-0.227
29	2.652	2.523	2.877	0.128	-0.225
June 5	2.645	2.522	2.871	0.122	-0.226
12	2.632	2.537	2.856	0.095	-0.223
19	2.647	2.541	2.872	0.106	-0.224
26	2.620	2.530	2.841	0.089	-0.221
July 3	2.647	2.541	2.872	0.106	-0.224
10	2.680	2.542	2.887	0.137	-0.207
17	2.660	2.576	2.884	0.083	-0.224
24	2.695	2.537		0.157	2.695
31	2.697	2.534		0.162	2.697
Aug. 7	2.710	2.538	2.692	0.171	0.018
14	2.731	2.552	2.706	0.179	0.024
21	2.587	2.531	2.683	0.055	-0.096
28	2.582	2.545	2.688	0.037	-0.105

TABLE 3 cont'd

Date	Ontario Cash	November Future Price	July Future Price	November Basis	July Basis
		-- 1968 Crop --			
Sept.4	2.777	2.538	2.683	0.238	0.093
11	2.780	2.546	2.693	0.233	0.086
18	2.765	2.564	2.710	0.200	0.054
25	2.535	2.537	2.732	-0.002	-0.197
		-- 1969 Crop --			
Oct. 2	2.475	2.557	2.729	-0.082	-0.254
9	2.460	2.593	2.768	-0.133	-0.308
16	2.485	2.622	2.775	-0.137	-0.290
23	2.482	2.642	2.797	-0.159	-0.314
29	2.465	2.623	2.802	-0.158	-0.337
Nov. 6	2.460	2.619	2.805	-0.159	-0.345
13	2.500	2.663	2.850	-0.163	-0.350
20	2.472	2.638	2.818	-0.165	-0.346
26	2.440		2.771	2.440	-0.331
Dec. 4	2.427	2.605	2.770	-0.178	-0.342
11	2.440	2.611	2.764	-0.171	-0.324
18	2.457	2.626	2.791	-0.168	-0.334
24	2.452	2.635	2.786	-0.183	-0.333
1970					
Jan. 1	2.455	2.614	2.773	-0.159	-0.318
8	2.485	2.625	2.786	-0.140	-0.301
15	2.497	2.647	2.809	-0.149	-0.311
22	2.537	2.675	2.810	-0.137	-0.273
29	2.520	2.660	2.783	-0.140	-0.263
Feb. 5	2.547	2.661	2.803	-0.113	-0.256
12	2.535	2.658	2.800	-0.123	-0.265
19	2.550	2.680	2.830	-0.130	-0.280
26	2.557	2.698	2.845	-0.141	-0.287
Mar. 5	2.550	2.713	2.837	-0.163	-0.287
12	2.555	2.711	2.849	-0.156	-0.294
19	2.550	2.708	2.833	-0.158	-0.283
26	2.627	2.775	2.829	-0.148	-0.201
Apr. 2	2.635	2.730	2.842	-0.095	-0.207
9	2.672	2.734	2.860	-0.061	-0.187
16	2.685	2.753	2.872	-0.068	-0.187
23	2.700	2.793	2.891	-0.093	-0.191
30	2.700	2.800	2.880	-0.100	-0.180
May 7	2.700	2.763	2.869	-0.063	-0.169
14	2.717	2.767	2.877	-0.050	-0.160
21	2.792	2.794	2.920	-0.002	-0.128
28	2.777	2.767	2.904	0.009	-0.127
June 4	2.737	2.720	2.842	0.016	-0.105
11	2.792	2.801	2.902	-0.008	-0.109
18	2.770	2.824	2.879	-0.054	-0.109
25	2.875	2.954	2.985	-0.079	-0.110
July 2	2.922	3.023	3.016	-0.101	-0.093
9	2.895	2.998	2.990	-0.103	-0.095
16	2.930	3.057	3.018	-0.127	-0.088
23	2.922	3.088		-0.165	2.922
30	2.782	2.930	3.098	-0.148	-0.316

TABLE 3 cont'd

Date	Ontario Cash	November Future Price	July Future Price	November Basis	July Basis
		-- 1969 Crop --			
Aug. 6	2.735	2.862	3.023	-0.127	-0.288
13	2.812	2.903	3.079	-0.090	-0.267
20	2.877	2.926	3.092	-0.048	-0.214
27	2.715	2.867	3.015	-0.152	-0.300
Sept.3	2.692	2.824	2.981	-0.131	-0.289
10	2.745	2.882	3.023	-0.137	-0.278
17	2.772	2.880	3.024	-0.107	-0.252
24	2.790	2.953	3.111	-0.163	-0.321
		-- 1970 Crop --			
Oct. 1	2.740	2.921	3.069	-0.181	-0.329
8	2.845	3.031	3.160	-0.186	-0.315
15	2.852	3.037	3.130	-0.184	-0.278
22	2.832	3.043	3.156	-0.211	-0.323
29	2.877	3.089	3.186	-0.212	-0.309
Nov. 5	2.895	3.105	3.236	-0.210	-0.341
12	2.915	3.117	3.213	-0.202	-0.298
19	2.945	3.108	3.236	-0.163	-0.291
26	2.875		3.169	2.875	-0.294
Dec. 3	2.847	2.897	3.128	-0.049	-0.281
10	2.817	2.836	3.072	-0.018	-0.255
17	2.887	2.851	3.148	0.036	-0.261
24	2.847	2.830	3.110	0.016	-0.263
31	2.845	2.834	3.105	0.010	-0.260
1971					
Jan. 7	2.860	2.832	3.104	0.027	-0.244
14	2.950	2.910	3.156	0.039	-0.206
21	3.005	2.943	3.191	0.061	-0.186
28	2.980	2.907	3.166	0.072	-0.186
Feb. 4	2.982	2.916	3.153	0.065	-0.171
11	2.982	2.911	3.148	0.070	-0.165
18	2.982	2.873	3.154	0.108	-0.172
25	2.985	2.873	3.137	0.111	-0.152
Mar. 4	2.972	2.850	3.090	0.122	-0.118
11	2.985	2.873	3.125	0.112	-0.140
18	2.942	2.895	3.083	0.046	-0.140
25	2.952	2.917	3.096	0.035	-0.144
Apr. 1	2.897	2.889	3.016	0.008	-0.119
8	2.855	2.866	2.982	-0.011	-0.127
15	2.870	2.849	2.986	0.021	-0.116
22	2.877	2.873	2.990	0.004	-0.112
29	2.840	2.842	2.956	-0.002	-0.116
May 6	2.910	2.915	3.029	-0.005	-0.119
13	2.890	2.901	3.003	-0.011	-0.113
20	2.970	2.955	3.079	0.014	-0.109
27	3.057	3.081	3.143	-0.024	-0.085

TABLE 3 cont'd

Date	Ontario Cash	November Future Price	July Future Price	November Basis	July Basis
		-- 1970 Crop --			
June 3	3.040	3.085	3.177	-0.045	-0.137
10	3.107	3.144	3.235	-0.037	-0.127
17	3.192	3.237	3.320	-0.044	-0.127
24	3.172	3.237	3.290	-0.064	-0.118
July 1	3.162	3.277	3.282	-0.115	-0.120
8	3.246	3.331	3.365	-0.085	-0.119
15	3.380	3.448	3.502	-0.068	-0.122
22	3.425	3.443		-0.018	3.435
29	3.250	3.295	3.392	-0.045	-0.142
Aug. 5	3.237	3.225	3.338	0.012	-0.101
12	3.233	3.207	3.313	0.026	-0.079
19	3.232	3.290	3.407	-0.058	-0.174
26	3.110	3.204	3.323	-0.094	-0.213
Sept.2	3.150	3.284	3.413	-0.134	-0.263
9	3.132	3.241	3.375	-0.108	-0.243
16	3.007	3.155	3.286	-0.147	-0.279
23	2.998	3.104	3.219	-0.105	-0.221
		— 1971 Crop —			
Oct. 1	3.030	3.113	3.230	-0.083	-0.200
7	3.042	3.161	3.279	-0.118	-0.236
14	3.127	3.243	3.333	-0.115	-0.205
21	3.152	3.266	3.386	-0.114	-0.233
28	3.102	3.214	3.352	-0.111	-0.249
Nov. 4	3.055	3.169	3.327	-0.114	-0.272
11	3.010	3.121	3.294	-0.111	-0.284
18	3.000	3.053	3.223	-0.053	-0.223
25	2.995		3.265	2.995	-0.270
Dec. 2	2.995	3.072	3.232	-0.077	-0.237
9	2.985	3.067	3.234	-0.082	-0.249
16	3.027	3.116	3.281	-0.088	-0.253
23	3.030	3.090	3.284	0.140	0.255
30	2.987	3.072	3.241	-0.085	-0.253
1972					
Jan. 6	2.960	3.017	3.230	-0.057	-0.270
13	2.885	2.991	3.170	-0.106	-0.285
20	2.985	3.037	3.234	-0.052	-0.249
27	3.015	3.063	3.279	-0.048	-0.264
Feb. 3	3.010	3.015	3.264	-0.005	-0.254
10	2.982	3.005	3.244	-0.022	-0.261
17	3.040	3.015	3.304	0.024	-0.264
24	3.112	3.076	3.367	0.035	-0.255
Mar. 2	3.172	3.125	3.421	0.046	-0.249
9	3.300	3.115	3.489	0.185	-0.189
16	3.225	3.104	3.415	0.120	-0.190
23	3.275	3.134	3.161	0.140	-0.185
30	3.285	3.158	3.471	0.126	-0.186

TABLE 3 cont'd

Date	Ontario Cash	November Future Price	July Future Price	November Basis	July Basis
		-- 1971 Crop --			
Apr. 6	3.385	3.215	3.566	0.169	-0.181
13	3.437	3.245	3.621	0.191	-0.184
20	3.392	3.228	3.554	0.164	-0.161
28	3.310	3.131	3.479	0.178	-0.169
May 4	3.340	3.144	3.472	0.195	-0.132
11	3.355	3.134	3.495	0.220	-0.140
18	3.450	3.193	3.655	0.256	-0.205
25	3.410	3.197	3.500	0.212	-0.090
June 1	3.385	3.158	3.443	0.226	-0.058
8	3.402	3.190	3.461	0.212	-0.058
15	3.350	3.172	3.407	0.177	-0.057
22	3.255	3.109	3.354	-0.854	-1.099
29	3.300	3.148	3.398	0.151	-0.098
July 6	3.385			3.385	3.385
13	3.320			3.320	3.320
20	3.290			3.290	3.290
27	3.373			3.373	3.373