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## *Basis Patterns*

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I will talk about “Basis and Basis Patterns” particularly in three areas: basis change over time within a particular crop year, basis changes over time one year versus a different crop year and, third—and the one I will emphasize the most—the basis geographically and basis changes geographically.

In this I hope to comment briefly on the causes of change in basis and, thus, finally get down to the business of how to effectively use basis from your diverse locations.

Now, the correct definition of “hedging” to prove that I know it: To hedge is to assume a position in futures equal and opposite to an existing cash position. Fine. However, for purposes of basis discussion, I like to define “hedging” as speculating in basis. To hedge is to speculate in basis versus to speculate in cash.

We oftentimes note that “hedging” and speculation” are defined as opposites. They are not opposite at all. They are quite different, but one is not the corollary of the other.

Some kinds of firms hedge to shift risks or to fix processing margins, but country elevators hedge to make a profit from a favorable basis change. There is no other reason for a country elevator to hedge than to make a profit from the hedging operation or to take a smaller loss than would otherwise occur in the ordinary course of business activities.

Just on the side, while you were cautioned yesterday against speculating, and I don't want to dispute this, I do want to recognize that in practice, some of you will on occasion use hedging to fix an already existing speculative profit on the cash operations, and I should say, on the other hand, to limit an already existing loss from having taken cash positions.

I recognize this as being part of the world in which many country elevators operate, while at the same time quite agreeing with what Mr. Wiese said yesterday about inadvisability of this in connection with your country grain elevator business.

If you want to speculate in cash prices or in price levels, in prices and price changes, do this on the side as an extra part of your activity and not connected with your grain business.

I stress this notion of the essence of speculating in basis because the essence of successful hedging is the forecasting of basis changes.

In part, this is fairly easy, and in part, it is quite difficult. Even the most rank novice can hedge and hedge successfully, but the more of it you do, the more you see possibilities of adding frills to it, and the more opportunity there is to use a really thorough and profound knowledge of basis behavior.

At the risk of boring you stiff, I think I should go over some of the theoretical fundamentals of basis behavior, the basis delivery points during the delivery of the month must be equal to zero. Cash and futures must be one and the same price.

In practice, as you see and hear quotations, you find they are not. If futures were cheaper than cash, those people who want to buy and use grain would buy the futures, take delivery, and get the cash. Those people who want to sell cash grain, if the futures are above the cash, would deliver futures.

Thus, they must be the same price—but in practice, they are not. I think yesterday the price of corn was three cents over the December, and this is the delivery month. In theory, they should be equal. They are, really.

What we are talking about when we mention cash corn at three cents over is a different commodity than delivered corn. There are several reasons why cash in most delivery months tends to be above the futures. Among these are that the exact time and place of delivery is known. If you buy cash, you know when you get it. If you go long futures and take delivery, you may get it the first day, the last day, or any day in between.

You know which elevator it is in, or which track it is on, or which boxcar it is in if you buy cash. You don't know for sure where you will get the delivery if you take delivery on futures. There are some differences in the freight billing lying behind some of the cash grain and some of the delivered grain. There are several different grades of grain that may be delivered at fixed differences, and there is always one cheapest deliverable grade, and I assure you when you take delivery, you will get that cheapest deliverable grade.

Two of the biggest takers on delivery of corn during the month of December this year have been, I understand, a downstate corn processor dry miller and a Chicago located corn-wheat miller. These people are, of course, willing to pay more for corn in boxcars than they are in elevators because they have to pay a load-out and switching charge, as the biggest single items.

Thus, you will find typically and regularly the cash is above the futures during

the delivery month. The first delivery month of the crop year this need not be true because grain may be flowing into storage.

The first of December, cash corn was under the December future by a cent or so. Corn was moving in and moving into storage and was a little slow getting unloaded, so you saw it selling for a little bit less than the future. It since has gone above.

Now with this little technical thing out of the way—the basis over time—the principle involved is that the cash gains in relation to the future because there are substantial costs of storing cash grains and very little, if any, cost of carrying futures contracts. Thus, the cash must gain in relation to future as the marketing season progresses.

In theory, the spot price should be under the future by the cost of carrying to the delivery month. A future should be under the next successive future within a given crop year by the cost of carrying to the next delivery.

I would like to mention a theoretical basis pattern for a two-year period. In the long run, the cash price of grain will increase by the cost of storing grain for a year.

If you compute a seasonal pattern of cash grain prices, do it over a long enough period of time so that your averages come out true. Then, with the increase in price during the year from harvest until the subsequent harvest, until late in the season, this cash price will regularly and consistently have a seasonal increase.

Now, the next season, you will start over. You don't change the general level of the price necessarily, and so this is the long run tendency for the behavior of cash grains.

Now, one might say why not just hold cash grains, and the heck with futures. I noticed yesterday we were “kicking around” the economist term *tendency*, and here we introduce another very favorite economic term, and that is *in the long run*. We kind of “debunk” this ourselves by saying, “In the long run, we are all dead,” and I think this is the point that Mr. Wiese was making about those people who do consistently, directly speculate in cash prices rather than in hedges. In the long run, they are all dead, and sometimes the long run gets a little bit short.

So, to the cash pattern: During the harvest period this cash price has a carrying cost, and the distant future will be above that by the cost of storing to that delivery month, say, July. This is the carrying charge theory discussed yesterday by Mr. Schultz.

The long run average price of July corn, for example, will not change. All of the changes in it will average out to essentially zero, and, thus, the cash gains in relation to the futures.

It costs money to store from May to July, and, thus, the May price will be under the July, March under May, December under March. And, if we do everything perfectly, comes out in a staircase pattern.

At the end of the year, the cash price goes back as it was and the December, March, May, and the July futures for the next year form the same neat theoretical pattern.

There is no difference between my system of drawing basis charts and Wiese's, except that I must consistently and regularly stand on my head to read Virg Wiese's charts.

And, this, twenty-five years ago, I could do for protracted periods with great skill, but I suddenly discovered one day, it is easier to be right side up. I think Virg is too old to learn new tricks. He has been drawing these far longer than I have and has some claim to being right because his way is the oldest, but I claim to being right because mine is newer.

Now, this is a fine theory and has one great fault. It does not work out. When theory and fact are at divergence, I suggest that one should revise the theory in line with the facts. If one must venture outside the cloistered halls, especially into the cruel world of business, and follow a theory that doesn't fit consistently with the facts, you inevitably lose money—unless you are a professor and write in sufficiently confused language that nobody cuts off your salary.

Now the theory doesn't work out because I talked in terms of cost of storage. I have said that the theory is here because it costs money to store cash grain, and it costs virtually nothing to carry a futures contract. There are large, fixed costs in carrying cash grain, one of which is the storage structure itself, and it doesn't depreciate it, insure it against fire and so forth, to have men looking after it, if it has grain in it than if it is sitting empty.

If there are large fixed costs, then there will be a market price of storage, and the market price of anything may be equal to cost, may be less than cost, may be more than cost, depending upon the relative supply-demand situation for the item in question. The price of storage will differ from year to year, as will the amount that the cash gains in relation to the future and the pattern that the carrying charge makes during the year.

There is one very notable change in our theoretical pattern. Harvest is the time of greatest demand for storage space in relation to the supply. If we have enough storage space to store an entire crop, we obviously have too much storage space most of the year because the total inventory of the commodity in store declines during the year.

Thus the highest market price for storage is at harvest and immediately following. And soon as you button up a crop, put it into storage and start taking it out of storage, the storage price per day goes down, and it goes down very sharply.

This means that this basis pattern will be wide at harvest. It will close up very quickly, and, then, level off and gradually close as shown on Wiese's charts. So this is the first change in your theoretical pattern, and to the extent, I would revise the theory.

And the second thing I would tell you is that not all years are alike because in

not all years are the supply of and the demand for storage space alike. Now, we have quite a variety of basis gains over the last decade. Those of you in the business know that during the 1961-62 crop year and during the 1962-63 crop year the gain in the basis was very much less than it has been in the several preceding years. The reason is very simple to see.

During the course of those two crop years, we reduced the carry-over of corn in the United States by roughly eight hundred million bushels, and this obviously left a lot more available storage space with nothing to put in it. The price of storage declined and declined sharply. So these changes between years vary quite substantially. They vary for good reason.

At the end of each year, you can look back and see, "Well, here was the basis pattern, and here is why." All we have really done is learned from experience.

There are very, very few basis charts published, particularly over long periods of time. I made an approach to some of this in a publication. It is the second of two things on the subject of basis that I intend eventually to get done. The first one is a longer manuscript of hedging operations designed for the use of country grain trade, and that manuscript is on my desk uncompleted and has been in that state for some time.

But, I did break down and write a little publication for the use of farmers that is again basically a basis publication. This is University of Illinois Bulletin 696, "The Use of Grain Futures Markets in the Farm Business."

For those of you who are in Illinois, I intend to make a complete distribution. You are on our automatic mailing list. The balance of you can obtain copies by writing to the Agricultural Information Office, College of Agriculture, University of Illinois, Urbana, and the price of the thing is thirty-five cents.

This has in it the raw cash and futures prices made into basis charts for, I think, six or seven years for each of four grains. The cash prices in question are East Central Illinois farm prices. As a matter of absolute fact, these farm prices are derived from track prices. They are at weekly intervals. The data also are included, but it does have a large number of basis charts in it showing the average for the period and for the individual years. You can examine the year-to-year differences.

The spreads among the futures delivery months are pretty much determined by the delivery situation at the delivery point. These are pretty much Chicago determined. The terminal elevators who have grain in store and hedged make the key decisions that establish the differences. You will note that over the last few weeks, the December has gained sharply in relation to the March corn.

Every terminal elevator which has hedges in the December has to decide whether to deliver or not.

Yesterday it was pointed out that a full carrying charge, December to March, is something like seven and one-half cents. It can get wider than seven and one-half cents. The December can go to a premium, and we have seen that happen.

What goes into the thinking of these people who either do or do not deliver? They, themselves, can't say, "Well, I did deliver at this difference. I did not deliver at some other difference."

If they deliver, and somebody orders it out, they have empty space. It makes them reluctant to deliver. If they deliver too much grain, then, they don't have a merchandising opportunity, and this is their bread and butter. If they deliver too much grain, they cannot admit the assorted qualities as effectively.

They must maintain the amount in grade that they have receipts out for, so the spread is more closely related to the supply of and demand for storage space at the terminal point, at the delivery point, than it is to the supply of and demand for storage space generally.

There is something of a tendency for these spreads to be at their widest at the harvesttime.

At country points, if we go through the summer at a basis of, say, ten under the nearby, in some years we find this narrows into harvest to, say, eight or seven or six under, and sometimes we find that it widens into the harvest to, say, twelve or fourteen or even more under.

You notice on the chart that 1960 crop corn went into the harvest on a fairly moderate sort of basis under the future, and then widened very, very substantially until at track, Illinois points, we had a basis of twenty-two, twenty-five cents under.

Anyone who had storage space at that time could sell it very well. Most people didn't have any, and that is why it got so wide. This was a matter of the crop turning out to be very much bigger than anyone thought, and farmers much more willing to sell it than anyone thought.

In years in which farmers tend to hold grain back on farms, we get a narrow basis at harvest. In years in which they are satisfied and sell aggressively at harvest, the basis tends to widen. If the crop turns out to be quite large, the basis is wide. If it turns out to be a bit smaller than expected, the basis narrows sharply at harvest.

These are things that you in country locations can judge and judge pretty well. Judging the demand side is more difficult.

In spite of the tremendous glut of corn that we had this year and the shortage of storage space or some place to put it as it came out of the fields, we have proceeded with a rather narrow corn basis throughout.

The primary reason for this is the high level of export demand for corn, so the demand has offset the glut and we have stayed with a rather narrow basis. This is a little more difficult for you to judge out in country positions.

Now, time is short, and I want to talk about basis over space, and I must recognize again, the shortage of existing basis charts you can use.

There are a half dozen or so people in this room who can effectively use

Wiese's basis charts because they live in Wiese's area, or can use my basis charts because we live in the same area, but the rest of you are pretty much on your own. Unfortunately, the data for drawing these up just simply does not exist. We know a lot of things about prices, but we do not know the price of grains at a wide assortment of interior points throughout the United States.

We are in the process of correcting this in Illinois, and in two or three years, we will know the price relations at many points within the state, but for the United States as a whole, this data is extremely difficult to develop.

Now there is a theoretical pattern to price relationship over space, and I want to mention very quickly three conditions. Let us put Chicago as the delivery point. Let us pick a spot for corn that always ships its corn to Chicago and never ships corn anywhere else. I am not sure such a point does exist.

Out along the Illinois-Iowa line it would go to Duluth or Minneapolis or Kansas City, so let's pick a rail line running west from Chicago and not very far out and say, "Well, if they ever do ship any corn, it is going to be shipped to Chicago."

Now the price at this point—this is a point tributary to the delivery point—the price will always be equal to the Chicago cash price minus freight. It is functionally tied to it. It cannot get loose from it in any way at all.

This is the simplest case. This is the most dependable basis if you are out here hedging. You know exactly what you can or cannot do, and you have a deliverable hedge—or deliverable insofar as the terminal elevators are deliverable. It becomes quite simple. As I say, this applies to practically no one, and, thus, the game gets to be more complicated.

Now, let us take a second case which I called "equalized to a common destination." Let us go to Baltimore, again, speaking theoretically. Now, we do regularly ship corn from Chicago to Baltimore for export.

Let us back off into a point in Ohio, and let us say that this point in Ohio consistently ships its surplus corn to Baltimore. There is a difference in the freight cost from Chicago to Baltimore and from this point in Ohio to Baltimore.

Suppose that the one from Chicago to Baltimore is twenty cents and the one from the Ohio point to Baltimore is ten. Thus, so long as these conditions are true—that Chicago is always shipping corn to Baltimore, and Ohio is always shipping corn to Baltimore—the difference between Chicago and the Ohio price will be that Ohio will be ten over Chicago.

But, if something happens that Ohio runs out of corn and can no longer ship to Baltimore, what will happen? Well, the Ohio price will go up enough that Chicago can effectively underprice it. This price will go up just a little bit in relation to Chicago, say, to eleven over, and when it goes up to eleven over, Baltimore reaches to Chicago for its supply. A rather small change will produce the difference.

Thus, where you have a common destination from two points, those two points are pretty closely related to the other.

Now, let us take the third case which applies to so many people. Let us take one in East Central Illinois. Look at corn or soybeans out of an East Central Illinois location and try to draw a map of where it goes as we work out these destinations. We find it goes in all directions, most particularly to processors within the area, to Chicago, St. Louis, New Orleans for export. It will go straight east for export, to the southeast for feed. It will go to distillers. It will go back this way to some distillers and so forth with no large percentage going to any single point.

Now, it is not tied to Chicago functionally, and, therefore, is not deliverable.

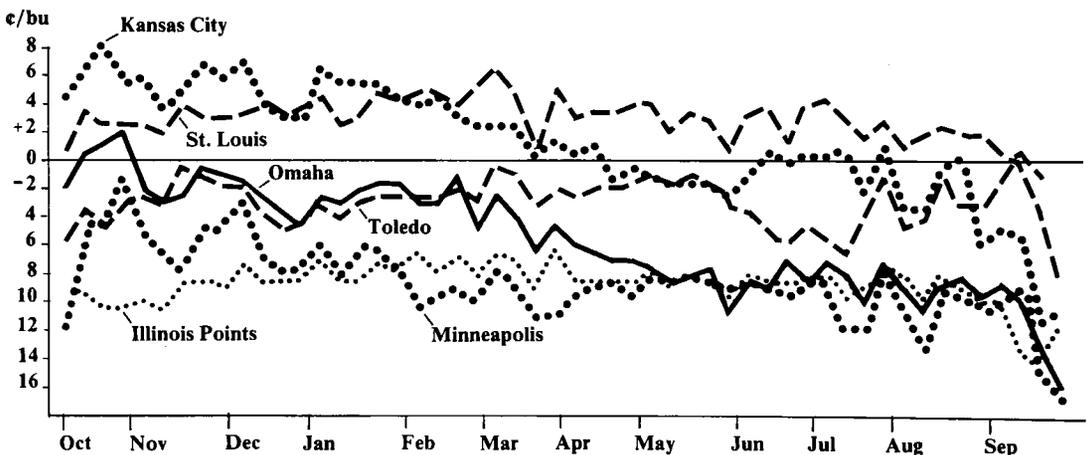
If both Chicago and this point are shipping to a common destination, and it costs more to move the grain from Chicago to that destination, cash prices at that point are apt to be over Chicago. If, on the other hand, they are shipping to a common destination and it is cheaper for Chicago to do it, Chicago prices will be higher.

So one would not expect necessarily a close relationship between the Chicago price and the prices at these multiplicities of points. However, a rather close relationship does exist. It must change from time to time and from year to year, but these changes need not be large.

It is these differences that direct the flow. In some years, perhaps the demand for corn is greater in the Southeast than in other years. Some years the demand for corn in Iowa or Nebraska is greater than other years. The relative supplies differ. Some years we have rather smaller crops in the West and larger in the East, so you can expect the price to gain in the West in relation to the East one year to the next, so there are differences in flows.

To generate these differences in flows, we must have differences in prices. Now, as I say, we know very little about the price at all kinds of locations, but I have worked out two graphs, one on corn, the other on soybeans. The straight zero line is the Chicago No. 2 Yellow corn price, with the difference in price between Chicago and the other points indicated by graph lines.

Corn—Various Points vs. Chicago 1962-63



These data are not very good. They are taken from Agricultural Marketing Service price quotations at these various points, and they show rather wide ranges, six- and seven-cent ranges for #2 corn in Omaha, for example. I think a lot of the variation is the result of inaccurate price reporting more than real differences in the relationship of price, one point to another. Let us take a look at the "Illinois Points," for example, which started the year out—and this is 1962-63—started the year out at nine under to ten and one-half, to nine, to seven and one-half, got in as narrow as six and one-half, and widened back out to the nine and one-half area. But note—except at the very end of the season—that this is a pretty stable difference, East Central Illinois to #2 price Chicago.

Keep in mind these are cash to cash, and hence, you see no basis pattern.

St. Louis carries a premium, or did that year. It is a very consistent premium not getting very far off the four-cent mark, and I think that premium was more consistent than the data show because St. Louis prices are not really well reported.

There are two exceptions to this. Look at Kansas City start at six and eight over, go under Chicago and wind up a lot under Chicago, so it made a downward pattern in here that season as did Omaha.

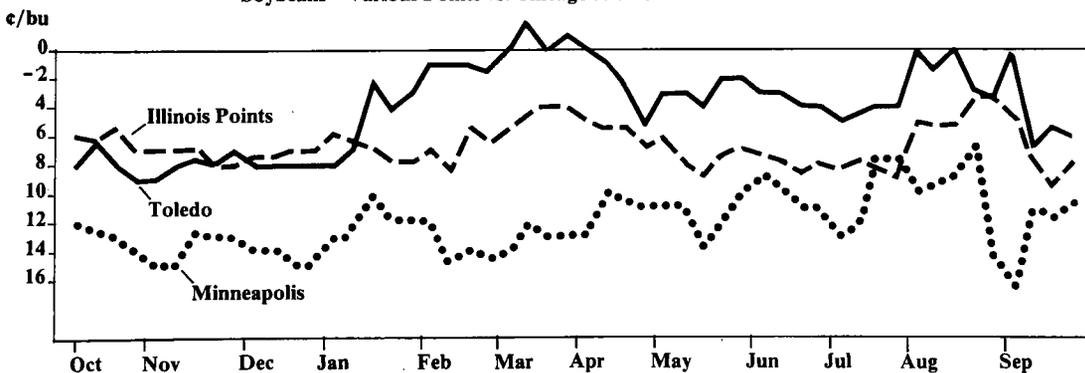
Minneapolis behaved itself pretty well. Toledo behaved itself pretty well in relation to Chicago.

What happened in the case that year of the Western corn—this is true of other Western locations as well as the two that I have tabulated—was that in the West, we tied up corn in the loan as we regularly do which gives it a high price relative to the East where we don't tie up so much corn in the loan.

However, last year for the first time in quite some time the price of corn in the East—that is, Illinois, Indiana, Ohio, the Southeast and so forth—did go up to the loan plus redemption. This happened later in the season, and with the Western corn already at the loan at the outset, the Eastern corn price increase was not accompanied by the comparable increase in cash prices in the West. They were already up, and you get this downward pattern for Kansas City and Omaha.

Now, let us take a real quick look at soybeans—the Illinois points price. It's a very solid, steady thing except for a little flurry in July when Chicago got a

Soybeans—Various Points vs. Chicago 1962-63



little strong because of limited deliveries. Toledo starts under and got actually above Chicago and fell off.

Now, Minneapolis behaved itself very nicely. I think most of the variation shown in here is the result of inaccurate price reporting, rather than any real difference, so Minneapolis and Chicago have a quite consistent relationship. This pattern is not a bad one except Toledo made this bulge in February-March.

Now, what does this mean to a hedger? In any of these locations in the case of corn, somebody hedging out of St. Louis has a nice relationship with which to work. You will have the same kind of a basis pattern that Chicago will have because it is a consistent premium. The same is true of Illinois points. The same is true of Toledo and Minneapolis. An elevator operator trying to hedge corn in Kansas City or Nebraska last year just had the basis working completely against him. All of his ordinary basis gain out of the futures was evened up by this decline in the Western position. It made an extremely difficult and unprofitable hedging problem.

Had he seen this correctly and anticipated the basis change correctly, he would have kicked the corn out of his elevators and put wheat in. You must forecast and know basis.

Now, something like happened in Toledo gives a beautiful situation in which to hedge. Not only do you get a normal cash to futures gain from this harvest period, but you get a magnified one that amounted to about nine cents.

It was about nine cents more profitable to store soybeans at Toledo last year than it was to store soybeans at Illinois points for the period from October to March, and it makes a very nice situation if you can catch that one.

Time has run out, and we should reach some conclusions. The first one is this. The most important thing is that a hedger knows his own basis. To hedge successfully, he must speculate successfully in basis change, and to speculate successfully in basis change, he must understand his basis, the reasons for what it has done in the past, and, thus, try and gauge what it may do in the future.

Keep basis charts for your location, develop them, keep them, compare them one year to the next. Try to decide why one year is different from the next. Try to look forward to see what you can expect to happen.

If you are not tributary to a delivery point—and practically everybody is not tributary to a delivery point—you must watch the deliverable supply at the delivery point very closely. This is critically important.

There have been occasions when we have had to pull grain from Toledo, Ohio, to Chicago for delivery, and this upset every normal relationship because we ran out at Chicago.

As long as supplies stay abundant in Chicago, you expect a normal relationship to prevail, and if supplies do not run out at Chicago, then,

something has got to get to be tributary Chicago that wasn't before, and you get a distortion of the entire pattern.

So, watch, and if you are short futures and long cash, and Chicago begins to run out of deliverable supplies, you had better get out of that particular hedging situation. It may go immediately sour on you.

The second point in addition to knowing your own basis is that I think you should sell the high market whether you are deliverable or not. We have been talking about storage income and earnings from basis operations, but we need to also think in terms of merchandising income from basis and basis operations.

The price is somewhat like a lake. The lake goes up and down without getting anywhere at all, with the surface remaining undulating, continually changing, but at any one point, it changes very little in these relationships.

Thus, if you have a cork out there, and the cork stays still, and there is a wind blowing waves, that cork will travel a long way up and down, but never gets anywhere. This is probably what happens to your individual location. Sometimes it is the cheapest place, and that is when you have got something to sell, and sometimes it is the highest market, and that is when you don't have anything to sell.

Now, the game is, when that cork is on the top of waves, sell, and when it is down in this trough, hold. If you are depressed in relation to this general price surface, hedge. When you see yourself sticking out above everything else, take the hedge off, and this gives you a merchandising opportunity.

It also requires that you work fairly well out in front, that you do not wait to sell something until you have to ship it, that you give yourself some time to select these merchandising spots.

Now, a third conclusion about keeping basis charts is that you should minimize transportation costs. I have over the times seen some very interesting opportunities arise. Harlan, Iowa, historically has had a fascinating situation in that when Iowa has surplus, Harlan ships it to Chicago for storage. In other seasons of the year it becomes deficit and Harlan has to reach to Chicago to get it back.

If you could be paid for storing it in Chicago and shipping it both ways, obviously if you stored it in Iowa on a hedge basis, you could make quite a lot of money.

I have seen soybeans in the Memphis-Arkansas area go below Chicago at harvest for an amount sufficient to barge them to Chicago and store them, and the following season I have seen them go over for the cost of barging them from Chicago to West Memphis. It is cheaper to store in the Mid-South than it is in Chicago.

This Arkansas basis was a "beaut" for a time, but too many people discovered this. They built some storage space, and, now, a year ago last fall, for the first

time, the West Memphis price stayed over the Chicago price even at the harvest. It is still a lucrative storage situation.

Many of you are located in areas that are surplus corn part of the year, deficit corn part of the year. If you watch, you'll find that you have really shipped corn out at some times of the year and shipped corn in at other times of the year. You had better hold it there and hold it hedged, and you will have much better basis situation than someone who is continuously shipping out.

East of the Mississippi a lot of people should look at the storage opportunities in soft wheat. Soft wheat sometimes goes from a short discount to something of a premium over this rather soft-hard wheat, and I think there are storage opportunities in that. The basis should be looked at in your location very carefully.

Finally, the competent basis operator must keep adequate basis charts, must understand the departures from normal basis patterns, and this underscores the need to recognize that the essence of hedging is successful basis speculation.