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Soybean Basis Patterns in Alabama Market Areas

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SOYBEAN BASIS PATTERNS IN ALABAMA MARKET AREAS

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INTRODUCTION

SOYBEAN PRODUCTION in Alabama has increased dramatically over the past 10 years. In 1968, 12.1 million bushels were harvested from 550 thousand acres, table 1. A seasonal average price of $2.42 per bushel resulted in a total value of slightly over $29 million. The 1978 Alabama production was 42.9 million bushels harvested from 1.95 million acres. This represented a 250 percent increase in acres harvested for the 10-year period. The average annual percentage change in acreage was 23.14 percent, figure 1. The seasonal average price of $6.70 per bushel gave a production value of well over $287 million in 1978.

The increased production in Alabama is especially significant when compared with the national average for the same period. For example, in 1968 there were just over 41 million acres harvested in the United States, yielding 1.1 billion bushels, table 2. For 1968, the national seasonal average price was $2.43 per bushel, with a total value of over $2.68 billion. Production in 1978 from the 63 million acres harvested was 1.84 billion bushels. Acreage harvested increased 53 percent during the 10-year period. The average annual percentage change in acreage in the United States was 7.31 percent, figure

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TABLE 1. SOYBEANS: ACRES HARVESTED, YIELD, PRODUCTION, AND VALUE, ALABAMA, 1968-78

Year	Acres harvested	Percentage change from previous year	Yield per acre, bushels	Production in bushels	Season average price, bushel	Value of production
	Thou.	*Pct.*	*No.*	*Thos.*	*Dol.*	*Thou. dol.*
1968	550	13.64	22.0	12,100	2.42	29,282
1969	630	14.55	22.5	14.175	2.31	32,744
1970	600	- 4.76	23.0	13,800	2,82	38,916
1971	655	9.17	26.0	17,030	2.92	49,728
1972	800	22.14	26.0	16,000	3,81	60,960
1973	970	21.25	21.0	20,370	5.64	114,887
1974	920	- 5.15	23.0	21,160	7.01	148,332
1975	1,260	36.96	24.5	30,870	4.88	150,646
1976	1,170	- 7.14	24.0	28,080	6.44	180,835
1977	1,600	36.75	21.0	33,600	5.75	193,200
1978	1,950	21.88	22.0	42,900	6.70	287,400

Source: Alabama Crop and Livestock Reporting Service. *Alabama Agricultural Statistics*. Bull. 21, August 1979.

1. Total value of production was over $12 billion computed from the seasonal average price of $6.75.

Although production has increased in Alabama, the yield per acre was below the national average yield per acre in each year of the 10-year period, tables 1 and 2. For instance, in 1978 the yield per acre in Alabama was 22.0 bushels per acre, and the national average yield was 29.5 bushels per acre.

The primary region of soybean production for Alabama has shifted during the last 10 years. In 1968, most of the acreage was located in the Gulf Area, particularly Baldwin and Es-

TABLE 2. SOYBEANS: ACRES HARVESTED, YIELD, PRODUCTION, AND VALUE, UNITED STATES, 1968-78

Year	Acres harvested	Percentage change from previous year	Yield per acre, bushels	Production in bushels	Season average price, bushel	Value of production
	Thou.	*Pct.*	*No.*	*Thou.*	*Dol.*	*Thou. dol.*
1968	41,391	1.51	26.7	1,106,958	2.43	2,688,571
1969	41,377	- .13	27.4	1,133,120	2.35	2,664,204
1970	42,249	2.21	26.7	1,127,100	2.85	3,214,710
1971	42,705	1.07	27.5	1,176,101	3.03	3,560,022
1972	45,683	6.97	27.8	1,270,608	4.37	5,550,074
1973	55,667	21.85	27.8	1,547,543	5.68	8,790,042
1974	51,341	- 7.77	23.7	1,216,287	6.64	8,078,943
1975	53,579	4.36	28.9	1,547,383	4.92	7,617,984
1976	49,358	- 7.88	26.1	1,287,560	6.81	8,768,979
1977	57,911	17.33	29.6	1,716,334	5.79	9,944,975
1978	63,343	9.38	29.5	1,843,000	6.75	12,440,025

Source: U. S. Department of Agriculture. *Agricultural Statistics*, 1978; *Agricultural Outlook*, AO-66, August 1979.

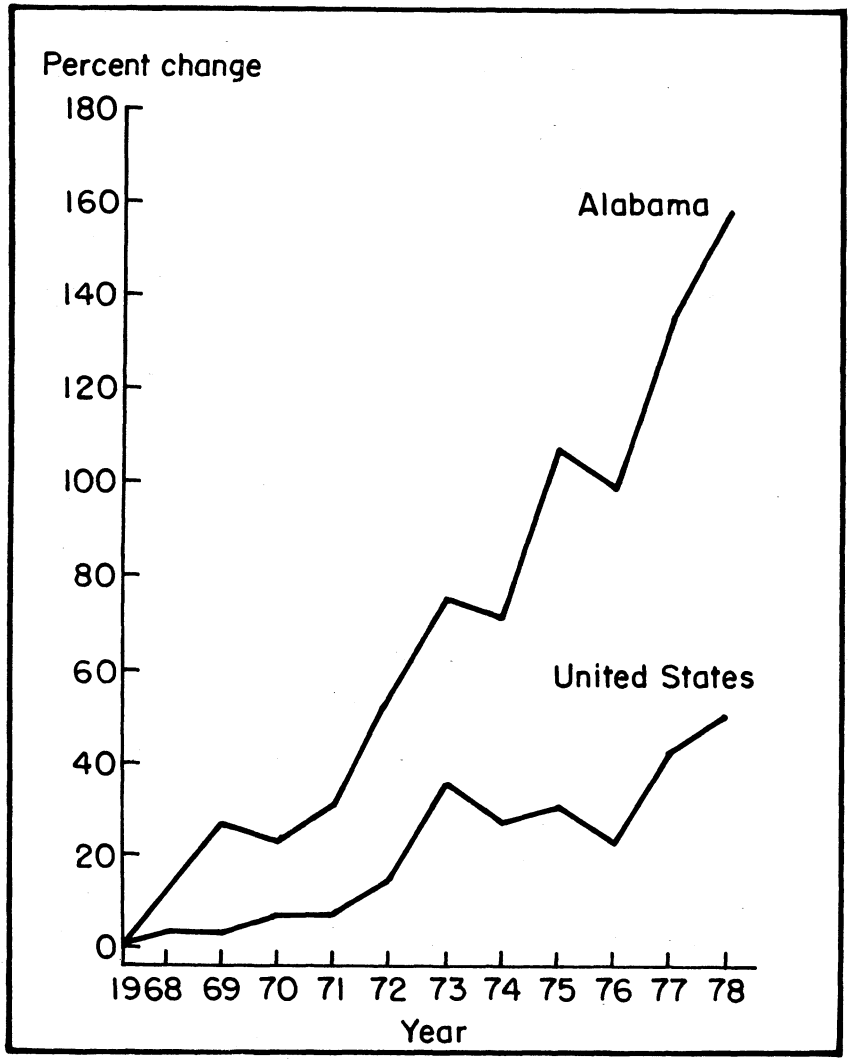


FIG. 1. Cumulative percentage change from the previous year in soybean acreage, Alabama and United States, 1968-78 (based on 1968).

cambia counties. Increased production of soybeans occurred mainly in the Tennessee Valley and Black Belt areas of the State. Today, there are 13 counties with over 50,000 acres of harvested soybeans as compared to only one county with that acreage in 1968, figure 2. Only two of the top five producing counties in 1968 were among the five leading counties in 1978, table 3.

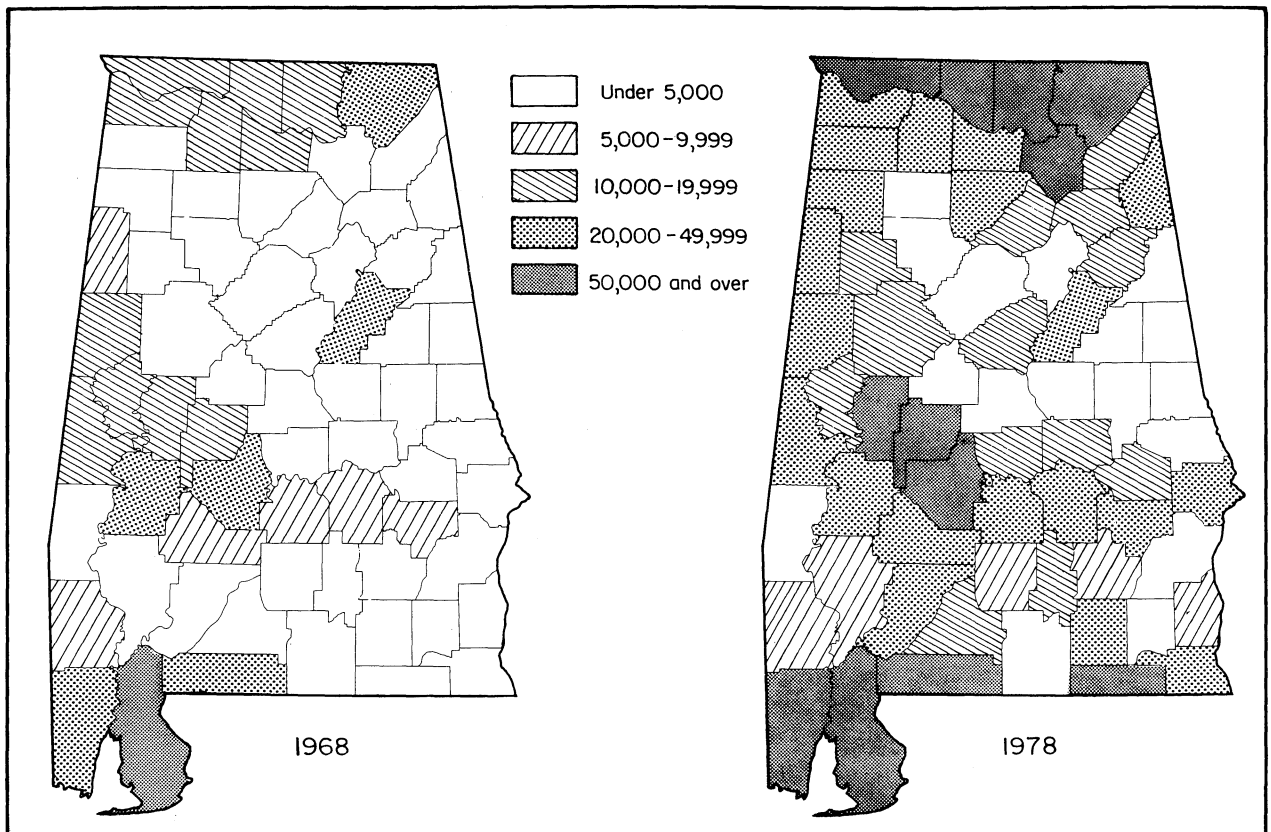


FIG. 2. Alabama soybean acreage, 1968 and 1978.

TABLE 3. ACREAGE OF SOYBEANS IN THE FIVE LEADING COUNTIES OF ALABAMA, 1968 AND 1978

1968		1978	
County	Acres harvested	County	Acres harvested
	No.		*No.*
Baldwin	109,000	Baldwin	168,000
Escambia	28,500	Madison	117,000
Jackson	26,000	Perry	100,000
Marengo	26,000	Jackson	77,000
Madison	25,000	Limestone	74,000

Source: Alabama Crop and Livestock Reporting Service. *Alabama Agricultural Statistics.* Bulletin 21, August 1979.

The increased interest in soybean production has generated many publications explaining marketing alternatives available to farmers. One such marketing alternative is the use of futures markets. Even though there are many publications and articles explaining the general use of futures markets, there is little information available on a key aspect of futures trading referred to as "basis." It is the purpose of this study to provide information on basis for soybeans in marketing areas of Alabama.

Objectives

Specific objectives of this study were:

1. To show the relationship of soybean prices among and within market areas of Alabama.
2. To explain the concepts and uses of basis.
3. To illustrate the basis pattern and calculate a basis table for each futures contract month in Alabama market areas.

Procedure

Daily cash prices at 21 marketing locations in Alabama were obtained for the period September 1975 through August 1979. These prices were compiled by the Alabama Farm Bureau through a daily telephone survey of each individual market. This service was part of a program that made price quotations available to Alabama Farm Bureau members.

Futures price quotations for the 7 soybean contract months of September, November, January, March, May, July, and August, during the 4-year period, were obtained from Dunn & Hargitt. Dunn & Hargitt is a commodity information firm with data banks for all commodities.

For this analysis, Alabama was divided into six market areas according to physical characteristics of soybean production. The six areas were: Tennessee Valley, Northeast, Black Belt, East Central, Wiregrass, and Gulf, figure 3. Each area had at least three markets for soybeans, with the exception of Wiregrass, which had only one. Counties included in these areas produced 98 percent of the soybeans grown in Alabama in 1978.

Statistical analyses were made to determine variation in prices among market areas within the State. Also, tests for variations in market price within individual market areas were conducted.

Basis patterns were computed for the State, and by market areas, for each futures contract month. Statistical analyses were used to determine the monthly average basis, standard deviation, and standard error from the 4 years of daily data. This information was used to compare the effects of changes in price level on basis, and to construct tables to illustrate the basis that could be expected during a crop year (i.e., September-August).

Variation in basis patterns among market areas was tested statistically using analysis of variance. Duncan's Multiple Range test was used to test market area differences in basis during a particular month of a crop year.

CONCEPTS OF BASIS

Basis is the key to the proper use of any marketing strategy. It can be a means of trading, a way to evaluate bids on forward contracts, and it can be used to evaluate when and how to use the futures market. However, an understanding of the concepts concerning basis must be gained before an appropriate application in marketing strategies can be developed.

Cash Prices

The cash price is simply the price that is being offered in the market place for the physical commodity. This price may be for delivery immediately or at a deferred time.

The main reason for differences in cash prices between market areas is geographical location. The difference in market price enables the movement of commodities from surplus

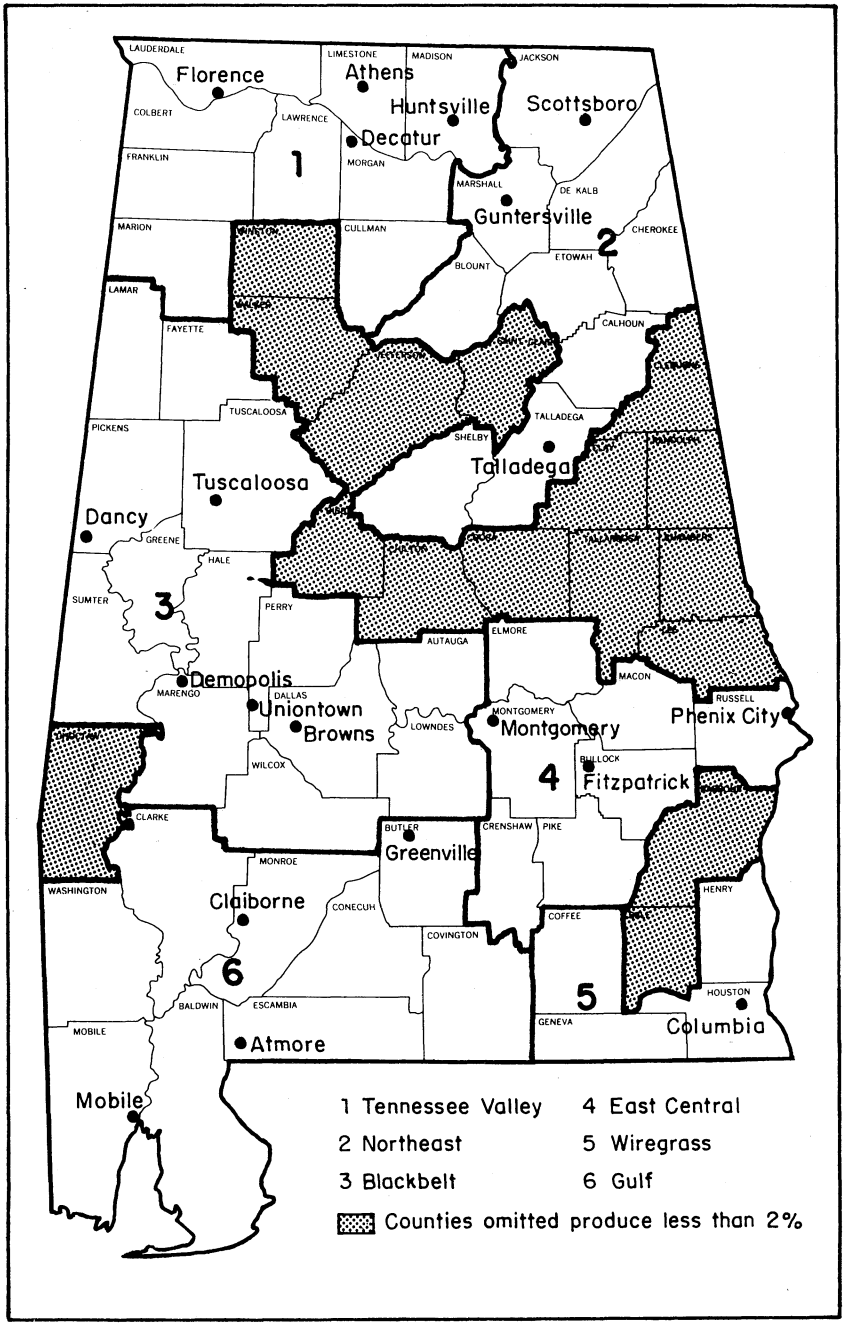


FIG. 3. Location of soybean markets, by market area in Alabama, 1979.

to deficit areas. Included in this price differential is the increasingly important factor of the cost of transportation.

The effects of market location on variability of cash price were statistically tested using analysis of variance. Price variability among market areas and within individual market areas was analyzed with the F-test.

An F-value of 1.67 led to an acceptance of the null hypothesis that price among market levels of Alabama was not significant at the .05 level. Therefore, the average cash price among market areas of Alabama for the 4 years was considered approximately equal.

Variability in cash price within particular market areas was not statistically significant at the .05 level for the Tennessee Valley, Northeast, Black Belt, and East Central market areas. Variability in cash price was statistically significant at the .05 level in the Gulf market area, as shown below.

Market areas	*F-value*
Tennessee Valley	.56
Northeast	.22
Blackbelt	.96
East Central	1.44
Wiregrass	a/
Gulf	3.36*

a / There was only one market in the Wiregrass area.
*Variability statistically significant at the .05 level.

Analysis of variance does not convey information as to the nature of variability in the Gulf market area. However, examination of the original data shows the variance could be attributed to the particular market located at the State docks in Mobile. Cash prices in Mobile were dependent primarily upon demands in the export market; therefore, the cash price fluctuated with the export market, which was highly variable.

Futures Price

A futures price is a quoted price for a contract of a specific commodity that could be delivered at a future point in time. Along with price, the contract specifies the quality and quantity of the commodity, and the place and date of delivery.

The futures price is determined by public auction on the trading floor of a commodity exchange. There are many buyers and sellers participating for themselves and others in trading. Each trade represents an assessment of new information leading to the derived price. In this respect, a futures price can be thought of as the expected price for a commodity at some

future date; however, as more information is assembled and interpreted, these expected prices change.

Futures prices are quoted for each month during which delivery of a commodity might be made. The delivery months for soybean contracts are January, March, May, July, August, September, and November. These particular months were chosen for the convenience of those trading soybean futures contracts, and to facilitate delivery of soybeans throughout the year. Thus, the large supply of soybeans from fall harvest can be allocated throughout the year by delivery in non-harvest delivery months. This situation occurs because distant months' price quotations generally are high enough to cover the costs involved in storing soybeans until the future date. The difference in price from one delivery month to the next is known as a "carrying charge."

The concept of carrying charge is very important to both buyer and seller of a commodity. For instance, in theory, the buyer is willing to pay a higher price for a distant futures month contract because of the ability to receive the commodity at that price without having to physically store the commodity. On the other hand, the seller is assured a price that is a reasonable return to cost of storage.

Everything being equal, the theory of carrying charge is acceptable; however, in reality other factors in the market affect the relationship of prices in different delivery months. One factor that can greatly affect this relationship is a strong demand for immediate delivery of a commodity. A very strong demand coupled with a small supply can develop into what is known as an inverted market. In this case, the nearby futures contract price is higher than the distant futures contract price.

Carrying charges should not be used for making comparisons between futures quotations for delivery months in separate crop years. Demand and supply conditions are different, even though there may be a relatively short time span separating the crop years. Since August is the outgoing delivery month of one crop year and September is the incoming delivery month for the next crop year, differences between futures prices of the two contracts are not related with respect to carrying charges. The August contract price represents the assumed utilization of the old crop, while the September contract price represents the expected supply from the new crop.

A futures contract is negotiated in terms of the possibility of delivering the physical commodity to satisfy a contract; how-

ever, only 2-3 percent of the contracts traded are ever liquidated by delivery. Normally, before a futures contract expires, an opposite and equal transaction is made offsetting the initial contract. The futures market serves as a means of price discovery for a commodity at a future date, and must not be thought of as a substitute for the cash market. The potential for delivery of soybeans ties the cash and futures markets together.

Cash and Futures Price Relationships-Basis

As noted earlier, the role of the futures market is that of price discovery; the cash market's role is that of providing for handling purchases and sales of the physical commodity. The relationship between the cash market and the futures market may be established through the existence of a trait common to both markets. The common trait to both markets is the possibility that a quantity of the physical commodity may be delivered to fulfill an obligation. This condition is obviously true for a transaction in the cash market; however, the potential for delivery is also applicable in the futures market. Each futures contract provides that a quantity of physical commodity may be delivered to fulfill an obligation created by a purchase or sale of a futures contract.

Each futures contract specifies a month and place or places of delivery, should delivery be made. The month specified is the contract month being traded, and delivery places are Chicago cash markets. Expiration of a futures contract occurs on a certain day, determined by the exchange, during the delivery month. Anyone having an outstanding contract during the delivery period (i.e., the week before the contract closes) must either make or accept delivery of the commodity, depending on whether it is a sale or a purchase contract. If delivery is not made, the trader is penalized for default. As the expiration date for a contract approaches, prices in the Chicago futures and cash markets normally converge. On expiration day, prices in the two markets will be approximately equal. Convergence of prices in the markets is necessary if the futures prices effectively represent what the cash market situation will be on the future date. The fundamental reason this situation occurs is that the prices equate to keep traders from taking advantage of a discrepancy in prices to buy in the low priced market, then sell in the higher priced market.

Since futures and Chicago cash price are approximately equal during the delivery month, the only difference in futures price and cash price elsewhere in the country for the same quality should be the cost of transportation. In a surplus producing area, cash price may be under futures by the amount it costs to transport a commodity to the Chicago market. On the other hand, in a deficit area price will equal price in Chicago plus transportation charge to that area.

The difference between cash and futures price (basis) in the delivery month includes cost of transportation and handling charges. The same relationship exists with the more distant futures trading months where basis consists of transportation and the full carrying charge. Therefore, basis tends to be widest and experience the greatest variance in months farthest from the delivery month. As the delivery month is approached, basis should narrow until the difference between local cash price and futures price is a reflection of the local supply and demand situation, and transportation and handling charges.

Just as seasonality affects price, seasonality also affects basis. Generally, for seasonally harvested commodities, basis does not narrow as much in fall delivery months as it does in spring delivery months. This situation is because of large supply relative to demand during the fall months when the newly harvested crop is being sold. During the spring, when market supply is limited, basis narrows. This relationship provides a return for incurred storage costs and results in the commodity moving to market out of harvest season.

Basis is important because it links a futures price with the local market price. Where futures prices reflect actual and expected conditions in the national and world markets, basis can translate those prices into conditions surrounding a local market area.

Importance of Basis in Futures Trading

An understanding of futures trading as a marketing strategy is very important to anyone concerned with producing, storing, processing, or marketing of a commodity for which there is a futures contract. The time element and the possibility of wide price fluctuations between deciding to produce a commodity and the time when the commodity is actually used, are key reasons for participating in futures trading. The relation-

ship of cash price and futures price quotations makes basis useful for decisions concerning whether and/or when to use futures trading as a marketing strategy.

Futures markets are used by many buyers and sellers with commercial commodity interests to reduce the risk of price fluctuations. This practice is accomplished through a procedure known as hedging. Hedging is the process of using the sale of a futures contract against the purchase of a cash (physical) commodity or vice versa. Hedging is possible because basis is relatively predictable from year to year, given a normal supply and demand situation. The risk of basis fluctuation is substituted for the risk of price fluctuation when offsetting a cash position with an equal but opposite position in the futures market. The hedge should be beneficial because the risk of a change in basis is much less than the risk of a price change.

The purpose of hedging is to "lock in" a particular price that is favorable to a person dealing with the actual commodity. The ultimate localized price, established through hedging, is the futures price quotation plus or minus the basis that is expected at the time the futures position will be liquidated. A miscalculation or change in the basis could lead to netting a higher price or a lower price, depending upon which way the basis is overcompensated.

Although hedging protects against adverse price movements, it also eliminates windfall gains. It is not the purpose of hedging to return the highest possible profit on every transaction; its purpose is to lock in a specific price which returns an acceptable margin. In effect, any losses in one market (cash or futures) are approximately recovered in the other market. The ultimate return depends only on how accurately the basis was predicted.

Basis provides a means for localizing futures prices, through taking into consideration the conditions surrounding a local market; therefore, it is a guide to whether the futures or cash market should be used. If demand for the physical commodity is strong, then basis is small. In this situation it may be more advantageous to use the cash market to receive the highest return. On the other hand, if demand in that market area is weak, basis is large. In this case it may be more advantageous to hedge in the futures market in which the basis should narrow as the delivery month is approached. If demand continues to be weak as the delivery month is approached, caus-

ing the basis to be larger than expected, there remains an alternative in the futures market. This alternative is called "rolling the hedge." It is accomplished by closing the existing contract and establishing a position in a later delivery month with the anticipation of liquidating the futures contract when the basis is smaller.

The fact that basis normally narrows by an amount approximately equal to the carrying charge as the delivery month approaches, gives the hedger an opportunity to receive payment for holding a commodity in storage. Regardless of the direction in which cash and futures prices move, there will be a return to storage as long as the basis narrows. If the contract basis reaches an abnormally small difference sooner than was expected, the hedge can be lifted to take advantage of the situation. Even though a hedge is placed with a particular contract month, it is important to remember it can be lifted at any time prior to that month.

The ability to lift a hedge before the contract expires is also important when conditions result in an inverted market. In this situation, the nearby futures contract is carrying a much higher price than the more distant futures contracts. Also, cash prices rise, which results in a smaller basis. As soon as the cash price equals the hedged futures price, there are no more gains to be made for the person in the hedged position; therefore, it is time to lift the futures hedge and sell the commodity in the cash market. The gains in this situation are more than what could have been expected, since normally the cash price never would have equalled exactly the futures price; consequently, storage returns are maximized. Once storage returns are maximized, it is the trader's decision whether to attempt a speculative position in the market to profit from further price increases.

When one chooses which delivery month to use for hedging, basis must be the prime consideration. For instance, the carrying charge between 2 months may appear to be sufficient to justify using the more distant futures month. However, until the expected basis between the 2 months is compared, a proper decision cannot be made. A carrying charge returning all the costs of storage between contract months would normally warrant rolling a hedge forward to take advantage of the returns to storage; however, basis may be so wide for the distant month that the localized price is lower than with the

contract currently being traded. The futures price and carrying charge are important, but the basis must be studied to translate that price into a local offer.

Other Uses of Basis Information

Basis information is useful in the futures market in other ways than just for hedging. One is through basis trading. Basis trading occurs when a commodity is traded only in terms of the basis relationship. A buyer and a seller agree to trade at a price that is a given amount over (higher than) or under (lower than) a specific futures price. This agreement is made a few months before the actual transaction takes place. A basis trader is usually someone who is on both sides of transactions (is both a buyer and a seller). For instance, an elevator operator may act as a basis trader by offering a producer a price a given amount under the futures price, and immediately accept a bid from a processor at a price under the futures price by a smaller amount than the price offered to the producer. A basis trader is only interested in having a better selling hedge than a buying hedge. As long as both transactions are handled within a short time span, to avoid any major fluctuations in futures prices, the basis trader is assured of a gain in the amount basis narrows.

Basis can also be compared among market areas to evaluate the best market price. Depending upon the market situation, a basis may be wider in the immediate local area than in a distant area. It may be that a narrower basis could justify the extra transportation to a distant market.

GENERAL ANALYSIS OF BASIS PATTERNS

A basis pattern represents the movement of the average monthly basis among calendar months during the crop year for a given futures contract. The basis pattern indicates the amount of narrowing and variation in the basis as the delivery month approaches. The basis pattern for each futures contract was determined for the six identified market areas.

Basis Patterns For Each Futures Contract

Existence of a seasonal pattern in basis for storable commodities harvested seasonally was referred to previously. The September futures contract, table 4 and figure 4, illustrates the difficulty of comparing basis patterns for futures contracts

TABLE 4. AVERAGE BASIS AND STANDARD DEVIATION,[1] BY CROP YEAR MONTHS, ALABAMA, 1975-76 THROUGH 1978-79

Month	Futures contract month						
	Sept.	Nov.	Jan.	Mar.	May	July	Aug.
	Dol./bu.	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*
September ...	−.26	−.30	−.37	−.44	−.49	−.51	−.53
	(.21)[2]	(.20)	(.21)	(.21)	(.22)	(.24)	(.27)
October	−.43	−.33	−.41	−.50	−.54	−.57	−.55
	(.25)	(.10)	(.10)	(.10)	(.12)	(.13)	(.16)
November ...	−.25	−.27	−.36	−.44	−.47	−.49	−.44
	(.32)	(.17)	(.12)	(.13)	(.16)	(.20)	(.23)
December ...	−.22	−.14	−.27	−.36	−.40	−.42	−.38
	(.33)	(.42)	(.08)	(.09)	(.13)	(.18)	(.22)
January	−.19	−.11	−.18	−.26	−.32	−.36	−.34
	(.26)	(.35)	(.09)	(.09)	(.10)	(.12)	(.15)
February	−.12	−.03	−.10	−.18	−.27	−.33	−.31
	(.23)	(.33)	(.34)	(.08)	(.10)	(.12)	(.12)
March	.12	.36	.29	−.15	−.24	−.29	−.24
	(.36)	(.59)	(.60)	(.07)	(.10)	(.12)	(.13)
April	.38	.67	.61	.53	−.22	−.23	−.14
	(.73)	(1.06)	(1.07)	(1.09)	(.11)	(.12)	(.19)
May	.34	.60	.53	.46	−.21	−.19	−.11
	(.68)	(.93)	(.95)	(.96)	(.18)	(.13)	(.20)
June	.02	.17	.12	.04	.00	−.22	−.20
	(.41)	(.58)	(.60)	(.61)	(.61)	(.14)	(.18)
July	−.09	−.03	−.10	−.18	−.22	−.25	−.23
	(.25)	(.33)	(.34)	(.34)	(.33)	(.16)	(.17)
August	−.13	−.09	−.18	−.26	−.32	−.35	−.23
	(.19)	(.23)	(.24)	(.24)	(.24)	(.25)	(.21)

[1]Number in parenthesis is standard deviation.
[2]Line separates the contract life from current crop year and the following crop year.

between crop years. There was no carrying charge between the August and September futures contracts; consequently, the September futures price was depressed under the August futures price. For this reason, the average monthly basis for the September contract was less in June, July, and August than in the delivery month of September. In September, basis returned to the normal relationship of representing the current demand and supply situation.

The basis pattern for delivery months of the same crop year generally revealed a narrowing of basis as a delivery month approached. This situation is illustrated by the November contract, table 4 and figure 5. As the November contract was traded in the previous crop year, basis was highly variable. In September, the new crop situation was more predictable, and the basis pattern showed a normal relationship of narrowing as the delivery month approached.

Although basis narrowed during the months preceding delivery date of the November contract, the narrowing of basis

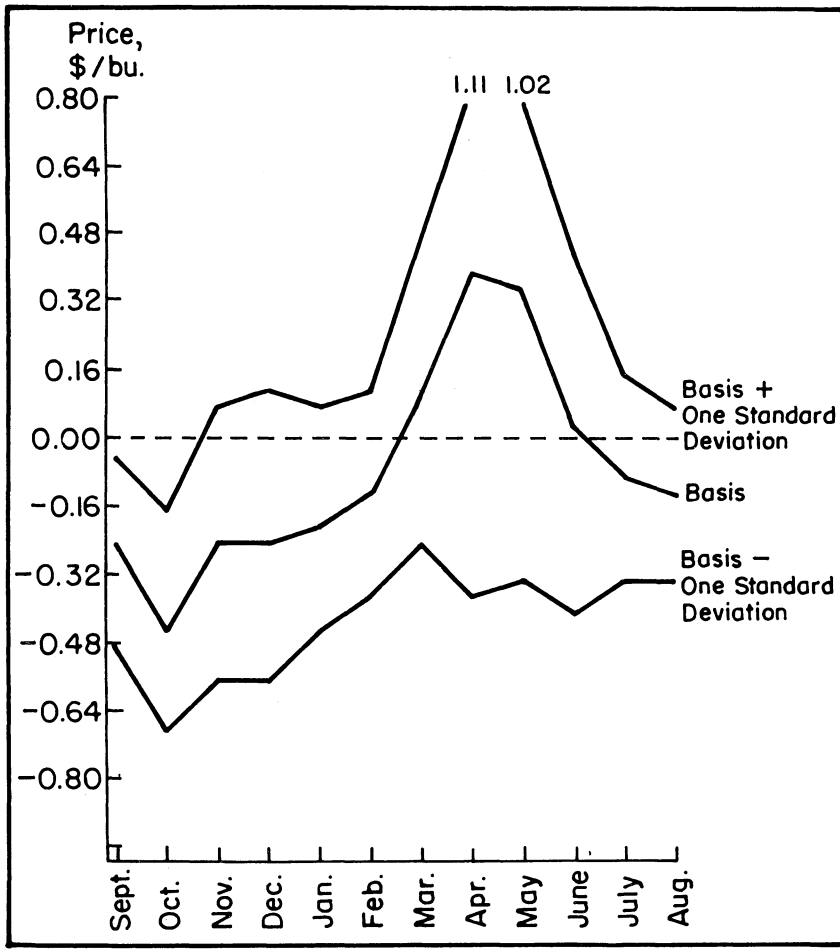


FIG. 4. September futures contract: basis mean and area of one standard deviation, Alabama, 1975-76 through 1978-79.

was greatest in the months preceding delivery of the January contract, table 4 and figure 6. This was caused by the large volume of soybeans harvested in November and returns for cost of storage from November to January.

Wide variation in basis occurred between contract months of different crop years, and also when trading a futures contract that was several months from the delivery date. The March contract, table 4 and figure 7, had an average monthly basis in

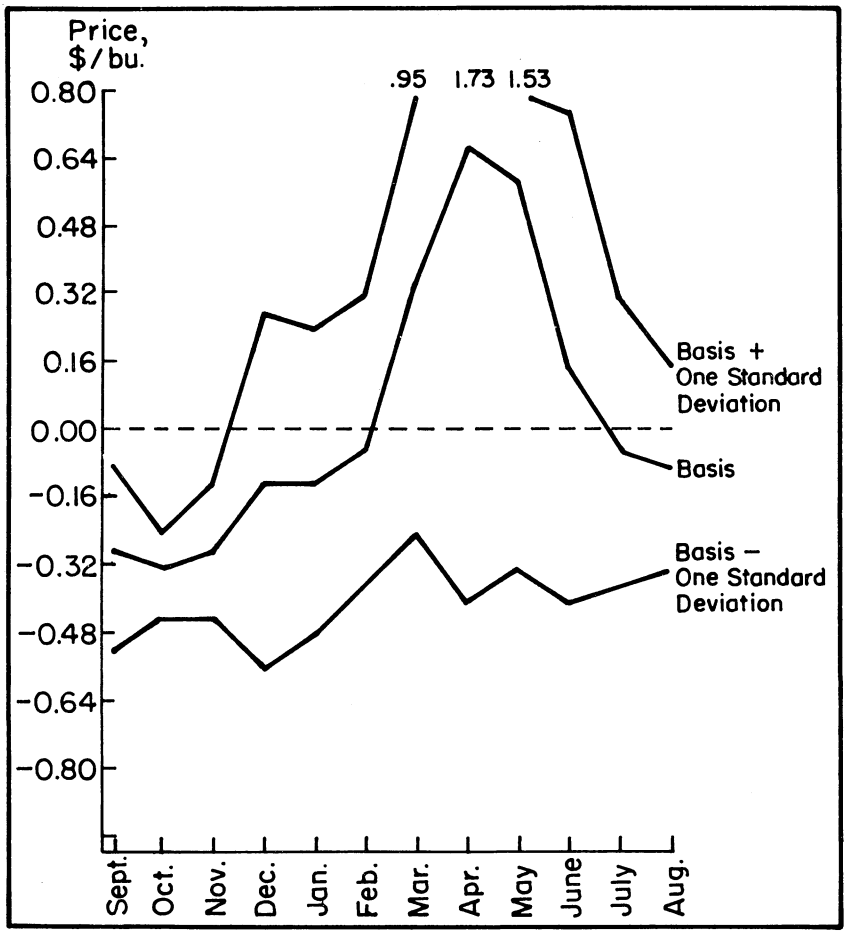


FIG. 5. November futures contract: basis mean and area of one standard deviation, Alabama, 1975-76 through 1978-79.

September of −$0.44 per bushel, with a standard deviation of $0.21 per bushel. By March the average monthly basis had narrowed to −$0.15 per bushel, with a standard deviation of $0.07 per bushel. The wide variation in basis occurred because of uncertainties concerning market conditions in the more distant months from the date of delivery.

The May contract, table 4 and figure 8, had little narrowing of basis during the 3 months prior to delivery. As the delivery month approached, and market conditions unfolded, basis var-

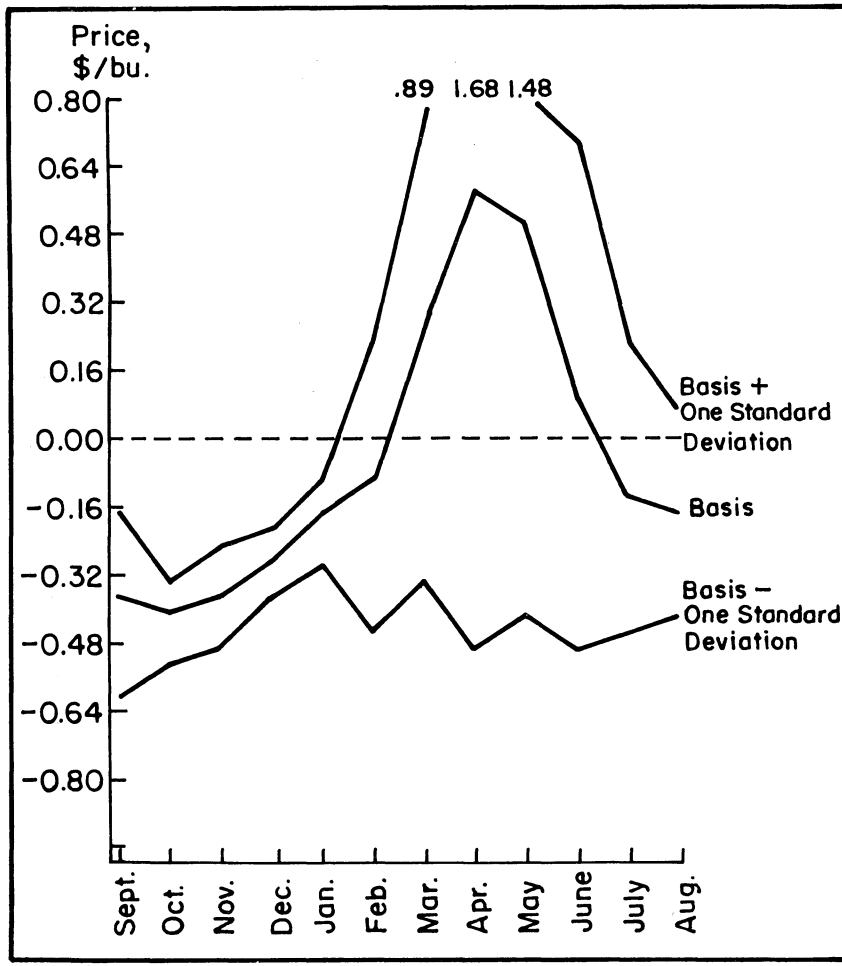


FIG. 6. January futures contract: basis mean and area of one standard deviation, Alabama, 1975-76 through 1978-79.

iability decreased. Since basis remained approximately the same during those 3 months, there was no payment to cost of storage from March to May. Consequently, if someone had used the May futures as a storage hedge, it would have been more profitable for that person to have liquidated his position in the May futures contract during March.

The average monthly basis and standard deviation increased between May and the delivery months for the July and August contracts, table 4 and figures 9 and 10. During this time

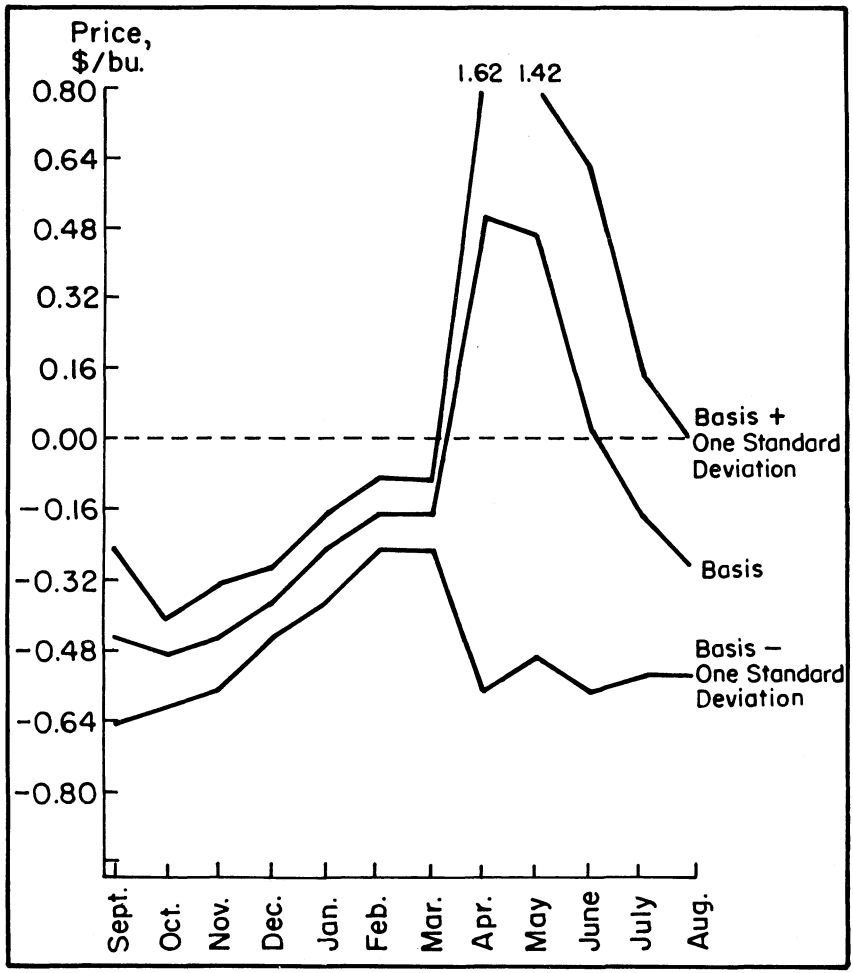


FIG. 7. March futures contract: basis mean and area of one standard deviation, Alabama, 1975-76 through 1978-79.

the movement of old-crop soybeans and the expected supply from the new crop resulted in the wide basis. This situation is similar to the May contract. In this case, there was no return to the cost of storage, and because of the increase in basis, a penalty was actually being absorbed by the person holding soybeans in storage beyond May.

The relationships among the May, July, and August futures contracts are very important to someone wanting to hedge a price for soybeans during the last months of a crop year. For

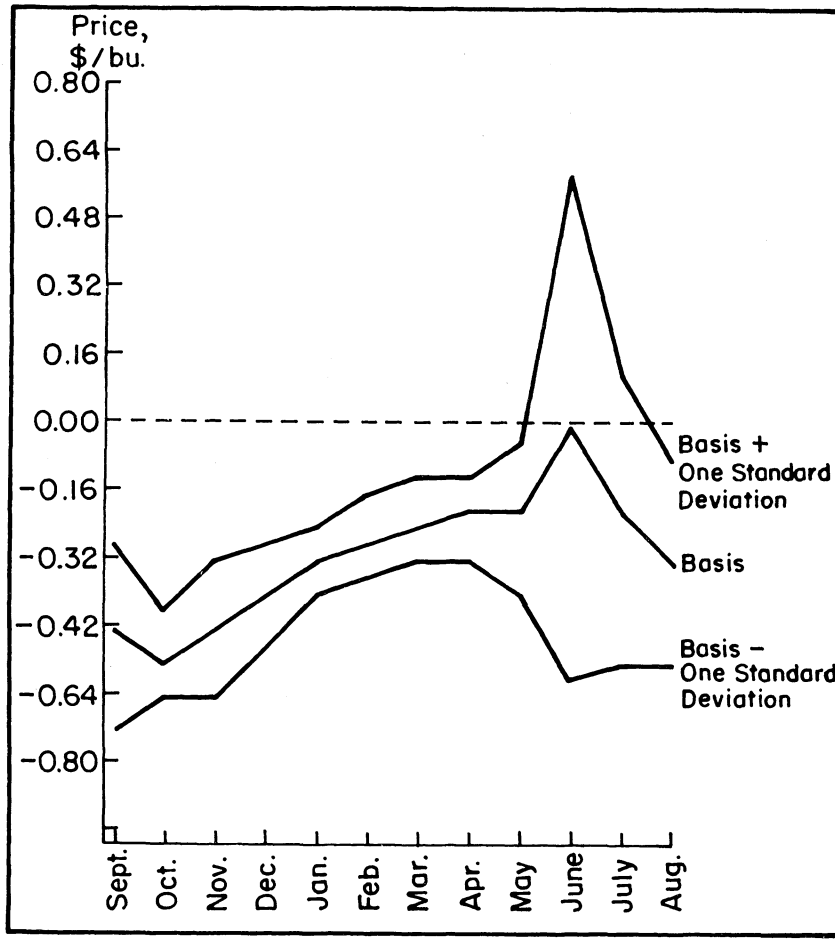


FIG. 8. May futures contract: basis mean and area of one standard deviation, Alabama, 1975-76 through 1978-79.

example, depending upon the carrying charge relationships among the May, July, and August contracts, it may be more advantageous to hedge with the July or August contract with the intention of liquidating that hedge in March, April, or May. This action would deviate from the standard example of hedging in the delivery month closest to the month the cash transaction is intended to occur. The reason for hedging in a delivery month different from anticipated delivery is that the greatest returns from hedging are from the futures contracts that have

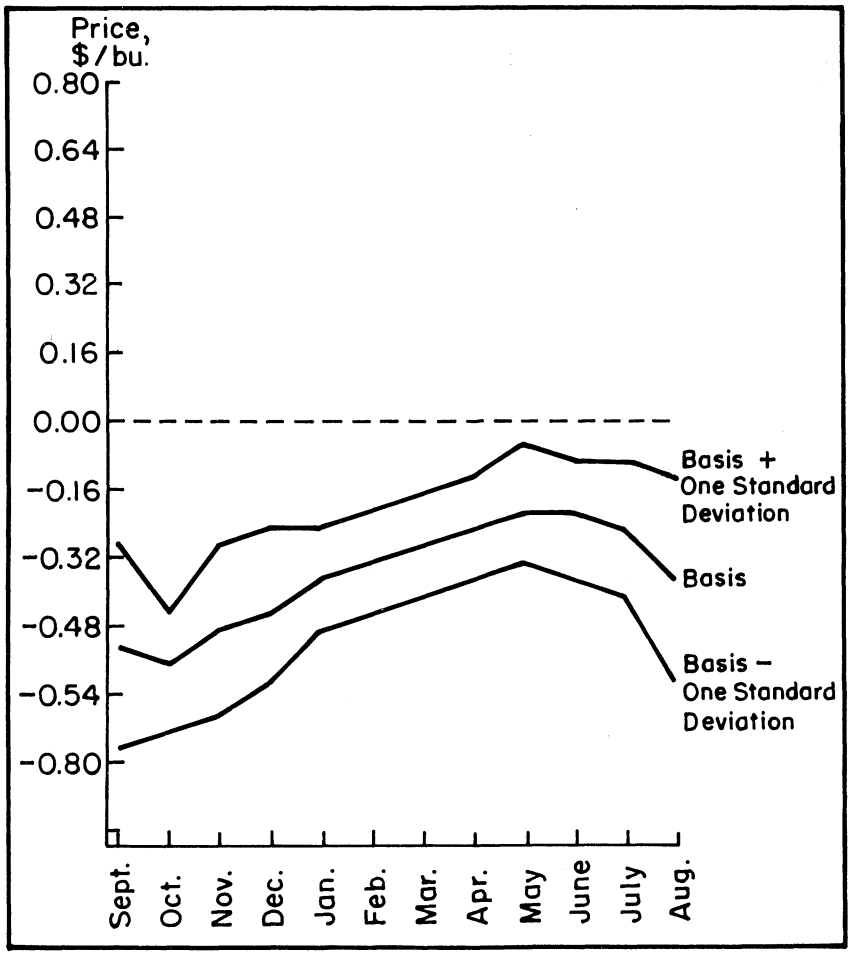


FIG. 9. July futures contract: basis mean and area of one standard deviation, Alabama, 1975-76 through 1978-79.

the largest change in the beginning to ending basis. However, anyone using this technique in hedging must consider the standard deviation of the average basis. Although basis may be less, the standard deviation may be larger, involving a greater amount of basis risk.

In conclusion, it is important to realize there is a narrowing of basis in Alabama as the delivery month is approached. The amount of narrowing depends upon the contract being examined because of differing market conditions prevalent during the crop year. These facts support the theoretical con-

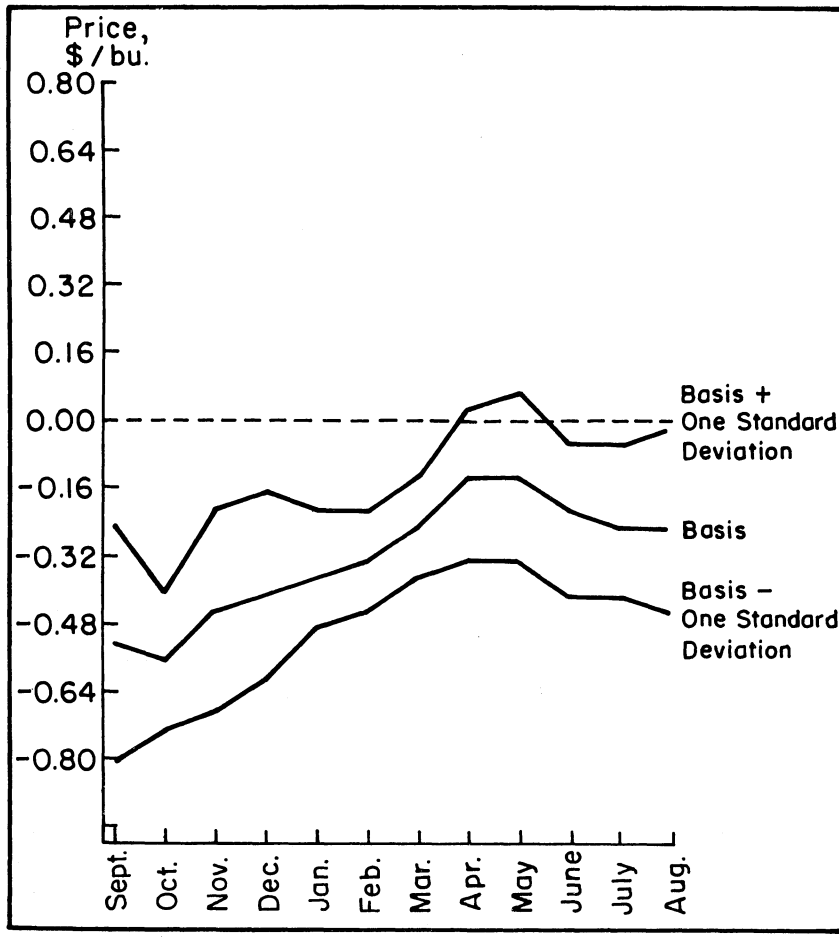


FIG. 10. August futures contract: basis mean and area of one standard deviation, Alabama, 1975-76 through 1978-79.

cepts concerning basis; therefore, the futures market is a force in the price discovery process for soybeans in Alabama.

Effects of Price Level on Basis Patterns for Soybeans

An examination of the effect of cash and futures price levels on basis was made. This examination was accomplished by calculating a monthly average for market price, futures price, and basis. The nearby futures quotation, the contract month nearest the present date, was the quotation used to determine basis. Data for each of the 4 years were grouped by month to

show the variability in the level that occurred in market price, futures price, and basis among years, figure 11. These data provided a comparison of a monthly average basis with the same futures contract, which tended to eliminate any change in basis that could have been associated with seasonal pattern.

In an overall analysis of the data, as price level increased or decreased, basis did not widen or narrow in a particular pattern. For example, in March the cash and futures price fluctuated between a level of just under $5.00 per bushel to a level above $8.00 per bushel. However, the basis during the 4-year period fluctuated only $.01 per bushel under or over the 4-year average basis of $.15 per bushel. A similar situation existed in April. As price level in April 1977 approached $10.00 per bushel, basis was $.25 per bushel. In 1978, price level dropped to approximately $7.00 per bushel, but basis remained at $.25 per bushel. The same was true for 1976 and 1979 when basis remained at $.18 per bushel, while prices were slightly below $5.00 per bushel in 1976 and slightly above $8.00 per bushel in 1979.

There was a difference of $.23 per bushel in the basis during May 1978 and May 1979, even though the price level changed little. This situation can only be explained by conditions in the local market area that were independent of the world situation.

An extremely wide basis of $.38 and $.42 per bushel existed during 1977 for July and August, respectively. This price level was also the lowest price level for these months during the 4 years. Price levels in 1976 and 1978 were approximately $7.00 per bushel in July and $6.00 per bushel in August; however, these years also represented the next widest basis and the narrowest basis during the 4 years.

Similar situations to the above months existed in all months during the 4 years. Although basis for a particular month varied among years, the fluctuation in basis was far less than the fluctuation in cash and futures price levels. The maximum fluctuation from the smallest to the largest basis during any month of the 4-year period occurred in September at $.34 per bushel (see following table). The widest fluctuation from the lowest to highest cash and futures price level during any month of the 4-year period occurred in April at $5.50 per bushel. Basis tended to fluctuate the most when moving from a contract month in one crop year to a contract month in another,

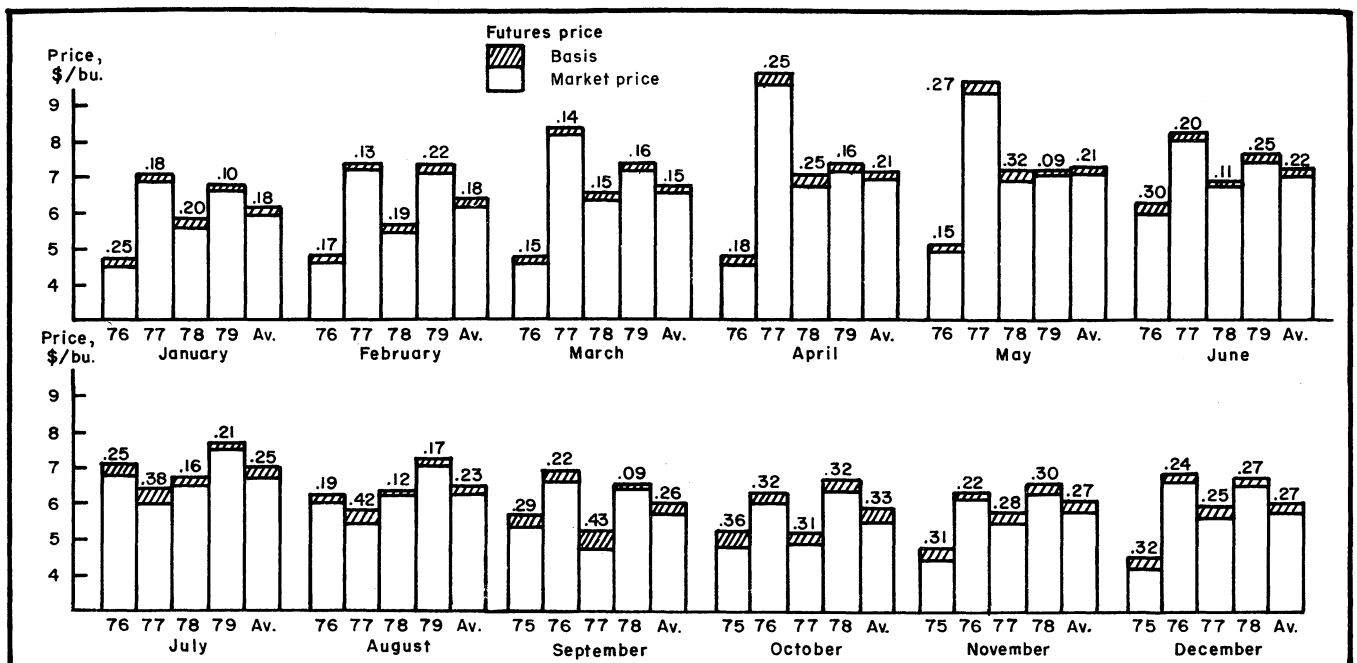


FIG. 11. Average market prices, futures price, and basis for soybeans by calendar month, Alabama, 1975-79.

and cash and futures price level fluctuated the most during the storage season. Therefore, basis fluctuated the most when the least amount of trading in the cash and futures markets

Month	*Maximum basis fluctuation during 1975-79*	*Maximum price level fluctuation during 1975-79*
	Dol.	Dol.
January	.15	3.50
February	.09	3.50
March	.02	4.00
April	.07	5.50
May	.17	4.50
June	.19	2.00
July	.22	1.50
August	.30	1.50
September	.34	2.00
October	.04	1.50
November	.09	2.00
December	.08	2.00
AVERAGE	.15	2.80

occurred. Also, when the uncertainties of price level were the greatest, basis fluctuated the least. These data showed that basis was much more predictable than was price level. Therefore, the relative predictability of basis makes it a valuable tool in developing marketing strategies.

DIFFERENCES IN SOYBEAN BASIS PATTERNS AMONG ALABAMA MARKET AREAS

There was no statistically significant difference in market price among market areas in Alabama; however, differences in basis among market areas may illustrate supply and demand of local market conditions. Basis patterns, in the nearby futures, represent enough change among market areas to show the movement of soybeans throughout the State during a crop year. Also, basis was calculated for each contract month in each market area, Appendix tables 1-6.

Analysis of Differences in Basis Pattern for a Crop Year

Market conditions prevalent among areas of Alabama were illustrated in the basis pattern of a nearby futures contract month. For that reason, the average monthly basis was calculated by calendar month using the nearby futures contract for each market area. Market areas were grouped according to whether average monthly basis was or was not significantly different from another market area, table 5. The statistical

TABLE 5. BASIS GROUPINGS AMONG MARKET AREAS BY MONTH, ALABAMA MARKET LOCATION, 1975-76 THROUGH 1978-79

Location	Basis	Groupings[1]	Location	Basis	Groupings[1]	Location	Basis	Groupings[1]
	Dol.			*Dol.*			*Dol.*	
September			**October**			**November**		
Northeast	−.17	A	Gulf	−.25	A	Gulf	−.15	A
Tennessee Valley	−.17	A	Black Belt	−.31	A B	Wiregrass	−.24	A B
East Central	−.29	B	Wiregrass	−.32	A B	Black Belt	−.24	A B
Gulf	−.30	B	East Central	−.32	A B	East Central	−.26	A B
Black Belt	−.32	B	Northeast	−.38	B	Northeast	−.35	B
Wiregrass	−.36	B	Tennessee Valley	−.39	B	Tennessee Valley	−.36	B
December			**January**			**February**		
Gulf	−.20	A	Gulf	−.12	A	Gulf	−.15	A
Black Belt	−.27	A B	Northeast	−.18	A	Northeast	−.17	A
East Central	−.27	A B	Black Belt	−.19	A	Tennessee Valley	−.18	A
Tennessee Valley	−.30	B	East Central	−.19	A	East Central	−.18	A
Wiregrass	−.30	B	Tennessee Valley	−.20	A	Wiregrass	−.19	A
Northeast	−0.30	B	Wiregrass	−.22	A	Black Belt	−.20	A
March			**April**			**May**		
Gulf	−.13	A	Northeast	−.19	A	Tennessee Valley	−.16	A
Tennessee Valley	−.14	A	Tennessee Valley	−.20	A	Northeast	−.17	A B
Northeast	−.14	A	Gulf	−.21	A B	Gulf	−.21	B C
Black Belt	−.16	A	East Central	−.23	A B	East Central	−.24	C
East Central	−.16	A	Black Belt	−.23	A B	Black Belt	−.24	C
Wiregrass	−.20	A	Wiregrass	−.28	B	Wiregrass	−.28	C
June			**July**			**August**		
Tennessee Valley	−.18	A	Tennessee Valley	−.15	A	Northeast	−.10	A
Northeast	−.18	A	Northeast	−.17	A	Tennessee Valley	−.10	A
Gulf	−.20	A B	Mobile	−.28	B	Gulf	−.38	B
Black Belt	−.25	B	East Central	−.30	B	East Central	−.29	B C
East Central	−.26	B	Black Belt	−.32	B	Black Belt	−.32	C D
Wiregrass	−.27	B	Wiregrass	−.34	B	Wiregrass	−.35	D

[1]Averages with the same letter are not significantly different at the .05 level.

procedure used was Duncan's Multiple Range Test. The difference in average monthly basis was not statistically significant at the .05 level in market areas shown with the same alphabetical letter.

In September, the average monthly basis was significantly different for the Tennessee Valley and Northeast from other market areas. This situation was caused by higher demand in the processing area of Alabama. September is early in the marketing year, and relatively few new crop soybeans are ready for marketing. Soybeans ready for marketing were being drawn to the processing area (i.e., Tennessee Valley and Northeast) by the narrower basis.

The Gulf basis was significantly different from the Northeast and Tennessee Valley during October and November. Not only is this the peak of harvest season, but it is also the beginning of the export season. The large supply in the Northeast and Tennessee Valley during harvest caused the basis to be somewhat wider than in September. As the export season began, the Gulf basis narrowed, drawing beans to that market.

In December, there was a significant difference in the Gulf and Tennessee Valley-Northeast markets; there was also a significant difference in the Gulf and Wiregrass areas. The Wiregrass area represented limited production and little storage facilities; therefore, once harvest was over the basis widened for the Wiregrass area and remained wide until the next harvest season.

There was no significant difference in the average basis among market areas in January through March. Basis narrowed in all markets during the period bringing the soybeans out of storage. Evidently, there was no demand and supply problem for any area of the State in which a significantly different basis would draw soybeans into that area.

Early April marked the end of the export season. Although not significantly different, the Gulf basis was wider than the Tennessee Valley-Northeast basis for the first time since the export season began. Another effect of the export season ending was the Wiregrass basis becoming significantly different from basis in the Tennessee Valley and Northeast areas. When the export season ended, any soybeans that remained in storage would have to be transported from the Wiregrass area, by truck or rail, to the processing area. Therefore, this was a key

example of transportation charge being involved in a wide basis.

The Tennessee Valley and Northeast areas' bases were significantly different from the rest of the State, with the exception of the Gulf, during May, June, and July. There may have been a slight increase in demand for soybean meal during these months because of increased poultry production, also located in this area. Therefore, as demand increased, the basis narrowed drawing stored soybeans into the market.

The Tennessee Valley and Northeast areas continued to have the narrowest basis in the month of August. Other market areas were also significantly different from each other. This illustrated that during the last month of the crop year basis varied significantly among market areas as the remaining supply from the old crop was distributed.

In conclusion, there was a significant difference in basis among market areas during the crop year. The relative changes in basis represented enough change in price to result in soybeans being moved from all market areas into the export and processing markets of Alabama.

SUMMARY

In this study, changes in soybean production in Alabama and the United States during the period 1968-78 were discussed. It was found that although soybean production had increased significantly in the United States and Alabama, percentage increases in Alabama were much greater. Also, major shifts in soybean production among counties in Alabama during the same 10-year period were illustrated.

Daily cash prices for soybeans at 21 market locations in Alabama were compiled by the Alabama Farm Bureau. This information extended from September 1975 through August 1979. The 21 market locations were grouped into six separate market areas according to geographic location and area of soybean production. These market areas were the Tennessee Valley, Northeast, Black Belt, East Central, Wiregrass, and Gulf.

Analysis of variance was used to test for significant price differences among and within these market areas. No significant difference in market price was found among market areas. The Gulf area was the only area where there was a significant

price difference among markets within a particular area. It was concluded that the large fluctuation in cash price at the State docks in Mobile was caused by variability associated with the export market.

Concepts involved with futures price quotations and the relationship between the cash and futures price ("basis") were discussed. The use of basis in production and storage hedging, evaluating prices for forward contracts, and in trading futures contracts, was also presented.

A record of daily price quotations for the 7 soybean futures contract months was purchased from Dunn and Hargitt, a commodity information firm. The futures price quotations for each contract were subtracted from the cash prices for each of the 21 markets for every trading day from September 1975 through August 1979. The resulting differences between cash and futures prices ("basis") were used to determine a monthly average, standard deviation, and standard error for the 4 years. These data supported the theoretical assumptions that the longer the time span previous to a contract maturity date, the wider and more variable will be the basis. Also, a convergence of the market and futures prices occurs as the maturity date approaches.

The effect of cash and futures price level on basis patterns was examined by computing monthly means for market prices, futures prices, and bases, throughout the 4-year period. Basis was determined by using the nearby contract month for each calendar month. Variability in basis was shown to be independent of the price level. Although basis fluctuated to some degree in corresponding months of different years, this variability was much less than that associated with price level.

Analysis of variance tests revealed a significant difference in the basis pattern in one or more market areas for each contract month. Therefore, to provide the best approximation of basis for a market area, basis was computed for each market area in Alabama.

To illustrate the difference in basis pattern among market areas, an average basis was computed by month, using the nearby futures contract. By the use of Duncan's Multiple Range Test, market areas were placed into groups in which basis patterns were not significantly different from each other. These groupings showed a definite correlation through the crop year in the flow of soybeans to the processing markets in

the Tennessee Valley and Northeast and the exporting market in Mobile.

Basis is an important factor in developing any market strategy because with this concept a local cash price can be linked to a futures price quotation. Therefore, a proper understanding of basis patterns by anyone involved in production, storing, processing, or marketing of a commodity is a must for making the best marketing decisions.

GLOSSARY

Futures contract: Term representing a contract specifying price, date, location, grade, and quantity of a commodity to be delivered at a future date. The contracts are traded on an organized exchange.

Basis: The difference between a local cash price and a futures price quotation. This difference reflects the cost of transportation to the delivery point, plus the cost of storage, interest, and insurance, until the delivery date of the contract.

Narrowing of basis: Covergence of the cash price and futures price quotation as the delivery month is approached. This situation occurs regardless of which quotation is the highest.

Basis risk: Chance or random variation in the basis.

Delivery month: The calendar month during which a futures contract matures. The delivery months for the soybean futures contracts are September, November, January, March, May, July, and August.

Nearby futures contract: The futures contract that is closest to the present date. For example, in October the November futures contract would be the nearby contract.

Distant futures contracts: Futures contracts that are 3 or more months away from delivery.

Maturing future: A futures contract during or immediately before the period when the seller can choose to make delivery.

Crop year: A year in terms of the seasonal pattern of harvest through storage. The crop year for soybeans is from September through August.

APPENDIX

APPENDIX TABLE 1. TENNESSEE VALLEY: AVERAGE BASIS AND STANDARD DEVIATION,[1] BY FUTURES CONTRACT MONTH, 1975-76 THROUGH 1978-79

Month	Futures contract month						
	Sept.	Nov.	Jan.	Mar.	May	July	Aug.
	Dol./bu.	*Dol./bu*	*Dol./bu.*	*Dol./bu.*	*Dol./bu*	*Dol./bu*	*Dol./bu.*
September ...	−.17	−.23	−.30	−.38	−.42	−.44	−.45
	(.15)[2]	(.17)	(.18)	(.18)	(.20)	(.21)	(.23)
October	−.49	−.38	−.47	−.55	−.60	−.63	−.60
	(.24)	(.07)	(.07)	(.08)	(.10)	(.13)	(.15)
November ..	−.34	−.36	−.44	−.52	.56	−.57	−.53
	(.32)	(.16)	(.09)	(.12)	(.15)	(.20)	(.22)
December ..	−.25	−.16	−.30	−.38	−.43	−.45	−.41
	(.31)	(.40)	(.08)	(.09)	(.11)	(.16)	(.20)
January	−.20	−.12	−.20	−.26	−.33	−.37	−.35
	(.23)	(.31)	(.06)	(.06)	(.07)	(.09)	(.12)
February	−.12	−.03	−.10	−.18	−.27	−.33	−.31
	(.20)	(.31)	(.31)	(.07)	(.10)	(.13)	(.12)
March	.14	.38	.31	−.14	−.21	−.27	−.22
	(.37)	(.59)	(.60)	(.05)	(.07)	(.09)	(.12)
April	.40	.69	.63	.56	−.20	−.21	−.12
	(.71)	(1.03)	(1.05)	(1.06)	(.09)	(.12)	(.19)
May	.39	.65	.59	.51	−.16	−.15	−.07
	(.62)	(.88)	(.89)	(.91)	(.16)	(.12)	(.17)
June	.08	.23	.17	.10	.06	−.18	−.16
	(.34)	(.51)	(.53)	(.54)	(.54)	(.11)	(.14)
July	.00	.07	.00	−.07	−.11	−.15	−.13
	(.19)	(.29)	(.29)	(.30)	(.29)	(.07)	(.09)
August	.00	.04	−.04	−.13	−.18	−.22	−.10
	(.13)	(.19)	(.20)	(.20)	(.20)	(.20)	(.12)

[1]Number in parenthesis is standard deviation.
[2]Line separates the contract life from current crop year and the following crop year.

APPENDIX TABLE 2. NORTHEAST: AVERAGE BASIS AND STANDARD DEVIATION,[1] BY FUTURES CONTRACT MONTH, 1975-76 THROUGH 1978-79

Month	Futures contract month						
	Sept.	Nov.	Jan.	Mar.	May	July	Aug.
	Dol./bu.	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*
September ..	−.17	−.22	−.29	.36	−.41	−.43	−.44
	(.13)[2]	(.17)	(.18)	(.18)	(.19)	(.20)	(.23)
October	−.49	−.38	−.47	−.55	−.60	−63	−.60
	(.26)	(.06)	(.06)	(.08)	(.10)	(.13)	(.16)
November ..	−.33	−.35	−.43	−.51	−.55	−.56	−.52
	(.31)	(.14)	(.07)	(.09)	(.13)	(.18)	(.21)
December ..	−.25	−.17	−.30	−.39	−.43	−.45	−.41
	(.32)	(.41)	(.08)	(.08)	(.11)	(.16)	(.20)
January	−.18	−.11	−.18	−.25	−.32	−(.36)	−(.34)
	(.25)	(.34)	(.09)	(.08)	(.08)	(.10)	(.13)
February	−.12	−.03	−.09	−.17	−.27	−.32	−.30
	(.23)	(.34)	(.34)	(.06)	(.08)	(.10)	(.10)
March	.14	.38	.31	−.14	−.22	−.27	−.23
	(.36)	(.59)	(.60)	(.04)	(.06)	(.07)	(.11)
April	.40	.69	.63	.56	−.19	−.21	−.12
	(.70)	(1.02)	(1.04)	(1.06)	(.09)	(.10)	(.18)
May	.37	.62	.56	.49	−.17	−.16	−.08
	(.63)	(.88)	(.90)	(.91)	(.15)	(.11)	(.17)
June	.06	.21	.16	.08	.04	−.18	−.17
	(.34)	(.51)	(.53)	(.54)	(.54)	(.10)	(.13)
July	.00	.06	−.01	−.08	−.12	−.17	−.14
	(.22)	(.33)	(.33)	(.33)	(.32)	(.11)	(.13)
August	.00	−.03	−.06	−.14	−.20	−.23	−.10
	(.15)	(.22)	(.22)	(.23)	(.22)	(.22)	(.12)

[1]Number in parenthesis is standard deviation.

[2]Line separates the contract life from current crop year and the following crop year.

APPENDIX TABLE 3. BLACK BELT: AVERAGE BASIS AND STANDARD DEVIATION,[1] BY FUTURES CONTRACT MONTH, 1975-76 THROUGH 1978-79

Month	Futures contract month						
	Sept.	Nov.	Jan.	Mar.	May	July	Aug.
	Dol./bu.	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*
September ...	−.32	−.35	−.42	−.49	−.54	−.56	−.59
	(.21)[2]	(.19)	(.20)	(.20)	(.22)	(.24)	(.27)
October	−.41	−.31	−.40	−.48	−.53	−.56	−.53
	(.23)	(.07)	(.08)	(.08)	(.09)	(.11)	(.13)
November ..	−.22	−.24	−.33	−.41	−.44	−.46	−.42
	(.31)	(.14)	(.07)	(.09)	(.13)	(.18)	(.21)
December ..	−.22	−.14	−.27	−.36	−.40	−.42	−.38
	(.33)	(.42)	(.06)	(.08)	(.13)	(.18)	(.22)
January	−.20	−.13	−.19	−.27	−.34	−.38	−.36
	(.27)	(.36)	(.08)	(.08)	(.10)	(.13)	(.16)
February	−.14	−.05	−.12	−.20	−.29	−.35	−.33
	(.23)	(.34)	(.34)	(.09)	(.12)	(.14)	(.14)
March	.11	.34	.28	−.16	−.25	−.30	−.26
	(.38)	(.61)	(.62)	(.08)	(.12)	(.14)	(.15)
April	.37	.66	.60	.52	−.23	−.25	−.15
	(.77)	(1.10)	(1.11)	(1.13)	(.09)	(.11)	(.20)
May	.31	.56	.50	.43	.24	−.21	−.14
	(.73)	(.98)	(1.00)	(1.01)	(.18)	(.14)	(.22)
June	−.01	.13	.07	.00	.04	−.25	−.24
	(.46)	(.63)	(.65)	(.66)	(.66)	(.16)	(.20)
July	−.17	−.11	−.18	−.25	−.29	−.32	−.30
	(.25)	(.33)	(.33)	(.34)	(.33)	(.16)	(.17)
August	−.22	−.18	−.27	−.35	−.41	−.44	−.32
	(.18)	(.21)	(.22)	(.24)	(.24)	(.25)	(.22)

[1]Number in parenthesis is standard deviation.
[2]Line separates the contract life from current crop year and the following crop year.

APPENDIX TABLE 4. EAST CENTRAL: AVERAGE BASIS AND STANDARD DEVIATION,[1] BY FUTURES CONTRACT MONTH, 1975-76 THROUGH 1978-79

Month	Futures contract month						
	Sept.	Nov.	Jan.	Mar.	May	July	Aug.
	Dol./bu.	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*
September ...	−.29	−.33	−.40	−.47	−.51	−.53	−.56
	(.20)[2]	(.19)	(.19)	(.20)	(.21)	(.23)	(.26)
October	−.42	−.32	−.40	−.49	−.53	−.56	−.54
	(.24)	(.07)	(.08)	(.08)	(.10)	(.12)	(.14)
November ..	−.24	−.26	−.35	−.43	0.46	−.48	−.44
	(.33)	(.16)	(.10)	(.12)	(.15)	(.20)	(.23)
December ..	−.22	−.14	−.27	−.36	−.40	−.43	−.39
	(.34)	(.43)	(.06)	(.08)	(.13)	(.18)	(.23)
January	−.20	−.12	−.19	−.27	−.33	−.38	−.36
	(.28)	(.37)	(.08)	(.08)	(.10)	(.13)	(.16)
February	−.12	−.03	−.10	−.18	−.28	−.33	−.31
	(.22)	(.33)	(.34)	(.06)	(.09)	(.11)	(.11)
March	.10	.34	.27	−.17	−.25	−.31	−.26
	(.36)	(.59)	(.60)	(.06)	(.09)	(.11)	(.12)
April	.37	.66	.59	.52	−.23	−.25	−.15
	(.74)	(1.07)	(1.08)	(1.10)	(.15)	(.16)	(.22)
May	.30	.56	.49	.42	−.24	−.22	−.14
	(.69)	(.95)	(.96)	(.98)	(.16)	(.12)	(.19)
June	−.02	.12	.07	−.01	.05	−.26	−.24
	(.43)	(.60)	(.61)	(.62)	(.63)	(.13)	(.18)
July	−.15	.09	−.16	−.23	−.27	−.30	−.28
	(.24)	(.33)	(.33)	(.33)	(.33)	(.16)	(.16)
August	−.19	.15	−.24	−.32	−.38	−.41	−.29
	(.17)	(.21)	(.22)	(.23)	(.23)	(.24)	(.20)

[1]Number in parenthesis is standard deviation.
[2]Line separates the contract life from current crop year and the following crop year.

APPENDIX TABLE 5. WIREGRASS: AVERAGE BASIS AND STANDARD DEVIATION,[1] BY FUTURES CONTRACT MONTH, 1975-76 THROUGH 1978-79

Month	Futures contract month						
	Sept.	Nov.	Jan.	Mar.	May	July	Aug.
	Dol./bu.	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*
September ...	−.36	−.39	−.46	−.53	−.57	−.60	−.63
	(.26)[2]	(.23)	(.23)	(.24)	(.25)	(.27)	(.31)
October	−.41	−.32	−.40	−.49	−.53	−.56	−.54
	(.26)	(.08)	(.09)	(.10)	(.11)	(.13)	(.16)
November ..	−.23	−.24	−.34	−.42	−.45	−.46	−.42
	(.31)	(.13)	(.06)	(.08)	(.11)	(.16)	(.20)
December ..	−.25	−.16	−.30	−.38	.43	−.45	−.41
	(.34)	(.43)	(.06)	(.07)	(.11)	(.17)	(.22)
January	−.23	−.15	−.22	−.30	−.36	−.40	−.39
	(.29)	(.38)	(.10)	(.09)	(.10)	(.13)	(.16)
February	−.13	−.04	−.11	−.19	−.28	−.34	−.32
	(.22)	(.34)	(.34)	(.05)	(.06)	(.08)	(.08)
March	.06	.29	.22	−.20	−.30	−.36	−.31
	(.33)	(.56)	(.56)	(.07)	(.11)	(.12)	(.11)
April	.31	.60	.54	.46	−.28	−.30	−.21
	(.73)	(1.06)	(1.08)	(1.09)	(.12)	(.08)	(.16)
May	.28	.54	.47	.40	−.28	−.24	−.16
	(.72)	(.97)	(.98)	(1.00)	(.22)	(.15)	(.20)
June	−.04	.10	.05	−.02	−.06	−.27	−.26
	(.45)	(.62)	(.63)	(.64)	(.65)	(.14)	(.18)
July	−.19	.13	−.20	−.28	−.31	−.34	−.32
	(.25)	(.33)	(.34)	(.34)	(.34)	(.17)	(.17)
August	−.24	.21	−.29	−.38	−.43	−.47	−.35
	(.15)	(.19)	(.20)	(.21)	(.22)	(.23)	(.22)

[1]Number in parenthesis is standard deviation.
[2]Line separates the contract life from current crop year and the following crop year.

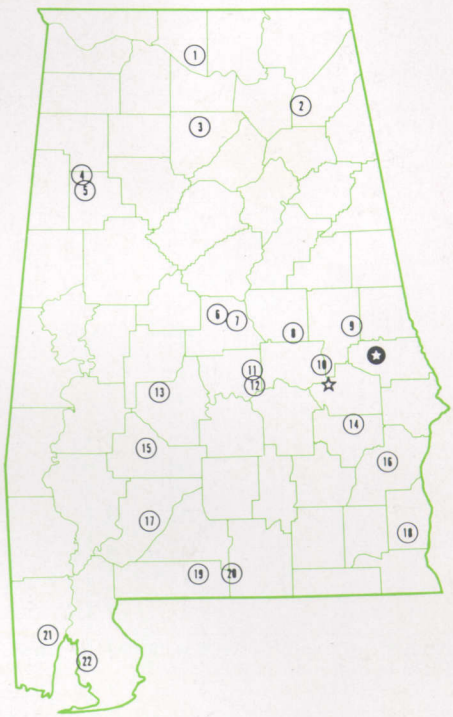
APPENDIX TABLE 6. GULF: AVERAGE BASIS AND STANDARD DEVIATION,[1] BY FUTURES CONTRACT MONTH, 1975-76 THROUGH 1978-79

Month	Futures contract month						
	Sept.	Nov.	Jan.	Mar.	May	July	Aug.
	Dol./bu.	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*	*Dol./bu.*
September ...	−.30	−.33	−.41	−.48	−.52	−.54	−.57
	(.25)[2]	(.23)	(.23)	(.24)	(.25)	(.27)	(.31)
October	−.34	−.25	−.33	−.41	−.46	−.49	−.47
	(.26)	(.12)	(.12)	(.12)	(.13)	(.14)	(.16)
November ..	−.14	−.15	.24	−.32	−.36	−.37	−.33
	(.32)	(.18)	(.12)	(.12)	(.15)	(.19)	(.22)
December ..	−.15	−.07	−.20	−.29	−.33	−.35	−.31
	(.33)	(.42)	(.08)	(.08)	(.12)	(.17)	(.22)
January	.14	−.07	−.12	−.21	−.28	−.32	−.30
	(.28)	(.37)	(.11)	(.10)	(.11)	(.13)	(.16)
February	−.08	.00	−.06	−.15	−.24	−.30	−.28
	(.24)	(.35)	(.35)	(.08)	(.09)	(.11)	(.11)
March	.13	.36	.30	−.13	−.23	−.28	−.24
	(.35)	(.58)	(.58)	(.10)	(.12)	(.13)	(.14)
April	.38	.67	.61	.53	−.21	−.23	−.14
	(.72)	(.105)	(1.07)	(1.08)	(.13)	(.09)	(.16)
May	.34	.59	.53	.46	−.21	−.19	−.10
	(.69)	(.94)	(.96)	(.97)	(.22)	(.15)	(.19)
June	.03	.17	.12	.04	.00	−.20	−.19
	(.44)	(.61)	(.62)	(.63)	(.63)	(.16)	(.19)
July	−.13	.07	−.14	−.22	−.26	−.28	−.26
	(.26)	(.35)	(.35)	(.35)	(.34)	(.20)	(.20)
August	−.18	.15	−.23	−.32	−.37	−.41	−.28
	(.17)	(.21)	(.21)	(.22)	(.23)	(.24)	(.24)

[1]Number in parenthesis is standard deviation.
[2]Line separates the contract life from current crop year and the following crop year.

Alabama's Agricultural Experiment Station System
AUBURN UNIVERSITY

With an agricultural research unit in every major soil area, Auburn University serves the needs of field crop, livestock, forestry, and horticultural producers in each region in Alabama. Every citizen of the State has a stake in this research program, since any advantage from new and more economical ways of producing and handling farm products directly benefits the consuming public.



Research Unit Identification

★ Main Agricultural Experiment Station, Auburn.
☆ E. V. Smith Research Center, Shorter.

1. Tennessee Valley Substation, Belle Mina.
2. Sand Mountain Substation, Crossville.
3. North Alabama Horticulture Substation, Cullman.
4. Upper Coastal Plain Substation, Winfield.
5. Forestry Unit, Fayette County.
6. Foundation Seed Stocks Farm, Thorsby.
7. Chilton Area Horticulture Substation, Clanton.
8. Forestry Unit, Coosa County.
9. Piedmont Substation, Camp Hill.
10. Plant Breeding Unit, Tallassee.
11. Forestry Unit, Autauga County.
12. Prattville Experiment Field, Prattville.
13. Black Belt Substation, Marion Junction.
14. The Turnipseed-Ikenberry Place, Union Springs.
15. Lower Coastal Plain Substation, Camden.
16. Forestry Unit, Barbour County.
17. Monroeville Experiment Field, Monroeville.
18. Wiregrass Substation, Headland.
19. Brewton Experiment Field, Brewton.
20. Solon Dixon Forestry Education Center, Covington and Escambia counties.
21. Ornamental Horticulture Field Station, Spring Hill.
22. Gulf Coast Substation, Fairhope.