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**Corn and Soybeans Basis Patterns
for Selected Locations in South Dakota, 1999**

by

Bashir A. Qasmi*

Economics Research Report 2000-6
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It is the intention of the author to update this report annually. Appropriate revisions will be made at those times. Requests for the update reports should be sent to the Economics Department, South Dakota State University, Scobey Hall, Box 504A, Brookings, SD-57007.

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Corn and Soybean Basis Patterns for Selected Locations in South Dakota, 1999

For successful marketing and merchandising in commodity markets, it is important to understand the relationship between cash and futures contract prices. The principal measure for relating these prices is local cash basis.

Defining the Basis

Basis, in its most basic definition, is the difference in the prices between two markets at a point in time. For this paper, basis is defined as the cash price minus the futures contract closing price (Gillis, 1984). This follows the norm of the grain industry. Since futures contracts are traded for a number of delivery months¹, theoretically, basis can be calculated with respect to each futures contract. When you hear someone in the grain business discuss basis, s/he is generally talking about the difference between the local cash price and the price for the nearest delivery month futures contract (nearby futures), unless it is a delivery month. For example, in January, the current basis for corn would be the difference between the local cash price and the March futures price (Chicago Board of Trade, 1990, 15). During the delivery month, the basis is the difference between the local cash price and the price for the next delivery month futures contract.

¹ Delivery months for Chicago Board of Trade corn futures contracts are March, May, July, September, and December. Delivery months for Chicago Board of Trade soybean futures contracts are January, March, May, July, August, September, and December.

Most pricing for corn and soybeans in South Dakota is based on nearby Chicago Board of Trade (CBOT) futures contracts. Following the industry norm, in the remainder of this manuscript, the bases for corn and soybeans are defined as cash price minus nearby CBOT futures contract settle price. Calculated this way, when the local cash price is lower than the futures price, the basis is negative. Relatively large negative basis is referred to as wide basis. Accordingly, a relatively small negative basis is referred to as narrow basis. When the cash price at a location is higher than the futures price, the basis is positive.

Basis becomes narrower or stronger when the cash price increases relative to the futures price, even though in reality the basis may be changing from a small negative basis to a large positive basis. Similarly, when the cash price at a location decreases relative to the futures price, the basis is said to become wider or weaker.

Derivation of Weekly Basis

Since cash prices vary with location, theoretically, bases can be calculated for every location in South Dakota. For this paper, corn and soybean bases were calculated for seven locations in the state (i.e. Sisseton, Watertown, Brookings, Madison, Vermillion, Canton, and Mitchell). These locations were selected because of: a) the availability of cash price data, and b) the researcher's desire to represent major cash markets for corn and soybeans in the state.

Weekly cash prices (the closing elevator bids for Thursdays) for no. 2 yellow corn and no. 2 yellow soybeans and weekly (Thursday's) data for relevant nearby CBOT futures contract settle price for corn and soybeans were collected off the Data Transmission Network (DTN).

The weekly bases were calculated by subtracting nearby futures contract settle prices from the corresponding cash prices until the last Thursday of the month preceding the delivery month. If the market was closed on Thursday, then the basis for that week was calculated by using the price for Wednesday or the other nearest market day in the week. During the contract delivery months, the futures markets are generally characterized by low trade volumes and erratic price swings. Accordingly, in case of delivery months, the futures contract for the next delivery month was considered the nearby contract.

In the case of corn, average (Avg) weekly bases and their standard deviations (Std) were calculated utilizing the data for corresponding weeks for years 1994-95 and 1997-99. Since corn prices for 1996 displayed an exceptionally abnormal pattern, the data for the year were not included in the computation of weekly average corn prices and their standard deviations. In the case of soybeans, Avg weekly bases and their Std's were calculated by utilizing the data for the corresponding weeks for years 1994-96 and 1998-99. Since the soybean prices for 1997 displayed an exceptionally abnormal pattern, the data for that year were not included in the computation of the weekly average soybean prices and their standard deviations.

Variations in the Basis for a Location

Basis is an indicator of a broad range of factors affecting cash and futures markets. These factors include:

- a) availability and cost of transportation,
- b) supply and demand conditions in the cash market relative to delivery points for the futures market,

- c) quality differences between the cash commodity and the product specified in the futures contract,
- d) availability of storage at the cash market relative to the futures market,
- e) price and availability of substitute commodities, and
- f) price expectations in the futures and cash markets (Besant, 1982).

In addition, any other event that impacts the orderly movement, storage, or marketing of a commodity can also affect local cash basis. As a result, basis for a commodity at a location can vary throughout the year as well as from one year to another. However, the variations within a year tend to follow fairly predictable seasonal patterns; deviations from the seasonal pattern are generally small relative to annual changes in the cash grain prices (Baldwin, 1986).

Seasonal Fluctuations in Corn Prices

Before examining the behavior of corn bases, it may be worthwhile to briefly overview seasonal fluctuations in the corn prices for the last few years. Weekly CBOT nearby corn futures prices for January 1994 through May 2000 are given in Table 1.

The corn marketing year starts with the beginning of corn harvest in September and runs through the end of August of the following year. In a normal crop year, corn prices start declining as the harvest time approaches and continue to decline during the harvest season. Following completion of harvest, prices slowly increase until the end of May. From June onward, the size of expected ending stocks as well as speculations regarding the size of the upcoming harvest start influencing the market. If the expected ending stocks from the current

crop year are low and the upcoming crop is expected to be short, prices start to show substantial increases. If the ending stocks from the current crop year are high and the upcoming crop is expected to be large, prices start to show weakness. During this period, the corn market is mainly driven by weather and is often quite volatile.

In the case of corn, both crop years 1998-99 and 1999-2000 were characterized by relatively high carryover stocks and high production. The crop year 1998-99 began with U.S. corn carryover stocks of 1.308 billion bushels (U.S. stock-to-use ratio of 19.2%) and U.S. corn production of 9.758 billion bushels (USDA, 2000). The nearby corn futures (\$ per bushel, settle) started at around \$2.08 at the beginning of the crop year, and dropped to \$2.05 by the first week of October 1998. Corn futures peaked for the crop year at \$2.30 during the third week of March 1999. Later, with the prospect of a good upcoming crop, the futures dropped to \$1.95 during the last week of August 1999 (Figure 1). The crop year 1999-2000 began with U.S. corn carryover of 1.787 billion bushels (U.S. stock-to-use ratio of 18.8%) and U.S. corn production of 9.437 billion bushels (USDA, 2000). The nearby corn futures started at \$2.22, dropped to \$1.93 in the last week of November 1999, and reached \$2.35 in the third week of March 2000.

Behavior of Corn Bases at Selected Locations

For all of the selected locations in South Dakota, cash corn prices were lower than nearby CBOT corn futures contract prices (Figures 2-3). As a result, corn bases for all selected locations were negative.

For overall comparison across the selected South Dakota locations and across different months, the weekly corn bases data for each of the 1999 and 1998 calendar years were analyzed

using regression analysis with dichotomous dummy variables for different locations and months. In this analysis, Watertown was specified as a reference location and January was specified as a reference month. Different dummy variables were introduced to estimate bases digressions for other locations and months. These regression results are presented in Tables 2 and 3.

In the regression for calendar year 1999, the intercept value of -48.17 cents represents the average Watertown corn basis in January 1999 (Table 2). The coefficients associated with other locations in the analysis depict the digressions of January bases from the Watertown level. The largest negative location coefficient in the regression is associated with Brookings, indicating that, in January 1999, the corn basis was widest at Brookings ($-48.17 - 3.39 = -51.56$ cents per bushel). The largest positive location coefficient is associated with Vermillion, indicating that, in January 1999, the corn basis was narrowest at Vermillion ($-48.17 + 8.21 = -39.96$ cents per bushel).

Similarly, the coefficients for other months in the regression show the divergence from the January 1999 bases. The corn bases were generally narrowest for the month of February closely followed by April (with the coefficients, 2.87 and 2.35 cents, respectively). The corn basis was generally widest for September (with the coefficient -22.55). The average corn basis for a particular location in a particular month can be calculated by combining the intercept term with the relevant location and month coefficients. For example, the average Brookings corn basis for September 1999 can be obtained by adding the intercept term to the coefficients for Brookings and October (i.e. $-48.17 - 3.39 - 22.55 = -74.11$ cents per bushel).

In the regression for calendar year 1998 (table 3), the intercept value of -48.63 cents represents the average Watertown corn basis in January 1998. The regression also shows that, during the year 1998, the monthly corn bases were widest at Brookings ($-48.63 - 0.98 =$

-49.61 cents per bushel) and narrowest at Vermillion (-48.63 +8.85 = -39.78 cents per bushel).

The regression also shows that during 1998, the corn bases were narrowest for April (6.96 cents narrower than January) and widest for October (-19.71 wider than January basis).

For each of the selected locations, weekly corn bases from January 1994 through March 2000 are presented in Tables 4 through 10. Also reported in these tables are the five-year average weekly bases and the standard deviations of the weekly bases for each of the selected locations.

Average weekly basis plus 2 standard deviations and average weekly basis minus 2 standard deviations provide a 95 percent confidence interval. A wider confidence interval indicates larger year to year fluctuations in the basis for that week. For each of the selected locations, five-year average weekly bases along with the 95 percent confidence intervals are presented graphically in Figures 4 through 10. Also shown in these figures are the weekly corn bases from January through March 2000. These figures indicate that the corn bases for South Dakota locations fluctuate most during the period of July through December. These figures also show that the corn bases for the selected South Dakota locations during January through March 2000 were wider as compared to the average level but were generally within the 95 percent confidence interval (Figures 4-10).

Seasonal Fluctuations in Soybean Prices

Before examining the behavior of soybean bases, a brief overview of the seasonal fluctuations in the soybean prices for the last few years is presented. Weekly CBOT nearby soybean futures prices for the period of January 1994 through May 2000 are given in Table 10.

The soybean marketing year starts with the beginning of U.S. soybean harvest in September and runs through the end of August of the following year. Since Brazil exports a significant portion of soybean and soybean products on the world market and since their harvest season starts in March, the soybean market displays much less seasonal fluctuation as compared to the corn market. In a normal crop year, soybean prices start softening as harvest time approaches in August and continue to decline slowly during the harvest season. Following the completion of harvest in mid October, soybean prices increase slowly until the following February when the Brazilian crop prospect starts to influence the market. From June onward, the expected ending U.S. stocks and speculation regarding the size of the upcoming U.S. soybean crop start influencing the market. If the expected ending soybean stocks from the current U.S. crop are low and the upcoming U.S. crop is expected to be short, prices begin to increase substantially. Conversely, if the U.S. ending stocks from the current crop year are high and the upcoming U.S. crop is expected to be large, prices begin to show weakness. Accordingly, during this period, the soybean market is mainly driven by weather and is quite volatile.

The soybean crop year 1998-99 began with relatively small U.S. carryover stocks (200 million bushels, with a U.S. stock-to-use ratio of 7.6%). In 1998, the U.S. produced a 2,741 million bushel soybean crop (a new high production record). The crop year started with nearby soybean futures (settle) at \$5.21 per bushel. Later, by the second week of November 1998, soybean futures increased to \$5.88 per bushel followed by a drop in prices. With the expectation of another large soybean crop in 1999, the futures dropped to \$4.10 by the second week of July 1999.

The crop year 1999-2000 began with U.S. soybean carryover stocks at 348 million bushels (a U.S. stock-to-use ratio of 13.4%). With a large U.S. soybean crop (2,643 million bushels in 1999), the total U.S. soybean supply for the year 1999-2000 topped the preceding year's supply. Accordingly, the crop year 1999-2000 started with the soybean futures around \$5.00. Soybean futures remained below \$5.00 through the middle of January 2000 and then recovered to \$5.37 by the end of March 2000 (Figure 11).

Behavior of Soybean Bases at Selected Locations

For all of the selected locations in South Dakota, cash soybean prices were lower than nearby CBOT soybean futures contract prices. As a result, soybean bases for all selected locations were negative (Figures 12-13).

Weekly bases data for the 1999 calendar year were analyzed using regression analysis with dichotomous dummy variables for different locations and months. Watertown was specified as a reference location and January was specified as a reference month. Different dummy variables were introduced in the analysis to estimate divergence of basis for the other locations and months. The estimated regression results are presented in Table 12.

In this regression, the intercept value of -51.60 cents represents the average Watertown soybean basis in January 1999. The coefficients associated with other locations in the analysis depict the deviations of January soybean basis from the Watertown level. The largest negative location coefficient of -0.31 cents for Madison indicates that in January 1999 soybean basis was widest for Madison ($-51.60 - 0.31 = -51.91$ cents). The largest positive co-efficient (+10.81 cents)

for Vermillion shows that, as compared to other locations in the analysis, the January 1999 soybean basis was narrowest at Vermillion ($-51.60 + 10.81 = -40.79$ cents per bushel).

Similarly, the coefficients for other months show the digressions from the January basis. The regression analysis shows that the soybean bases were narrowest in May (with the largest positive co-efficient in the regression, +3.72) and widest in the month of October (with the largest negative coefficient, -22.54). The average soybean basis for a particular location and a particular month can be calculated by combining the intercept term with the relevant location and month coefficients. For example, average Brookings soybean basis for October 1999 can be obtained by adding the intercept to the coefficients for Brookings and October (i.e. $-51.60 + 0.27 - 22.54 = -73.87$ cents per bushel).

The results of regression analysis for calendar year 1998 are presented in Table 13. The analysis shows that, during 1998, the soybean bases were widest for Sisseton ($-51.91 + 0.50 = -51.41$ cents per bu.) and most narrow for Vermillion ($-51.60 + 10.12 = -41.48$ cents per bu.). The regression analysis also shows that during the year 1998 the weekly soybean bases were narrowest in August and widest in November (Table 13).

For each of the selected locations, weekly soybean bases for January 1994 through March 2000 are presented in Tables 12-18. Also reported in these tables are the five-year average weekly soybean bases and the standard deviations in the weekly bases. The weekly averages and their standard deviations were computed using the data for calendar years 1994-96 and 1998-99. The soybean bases for some weeks of the year 1998 were exceptionally abnormal. Accordingly, the data for the calendar year 1998 were excluded in computing the average weekly soybean bases and their standard deviations.

For each of the selected locations, average weekly soybean basis (for five years) along with 95 percent confidence interval are presented graphically in Figures 14-20. Also shown in these figures are the weekly soybean bases from January through March 2000. Soybean bases for South Dakota locations generally show the most fluctuation during the months of August and September (Figures 14-20).

Using Bases in Grain Marketing Decisions

Information on local basis is useful in determining the timing of sales as well as the appropriate marketing tools for farm commodities (O'Conner and Anderson, 1989). The information on local basis along with the appropriate information on futures contracts and options (puts and calls on futures contracts) can be used to: a) derive an expected local cash price, b) evaluate a cash forward contract, c) determine the profitability of storage and timing of sale(s), d) evaluate a basis contract, e) calculate the expected hedge price, and f) calculate the maximum and minimum prices when utilizing puts and calls. A brief discussion of each of these follows.²

a) Deriving An Expected Cash Price. The expected local cash price can be estimated by adjusting the appropriate futures contract price for the relevant basis. Let us say it is May 18, 2000, and we are interested in calculating the expected cash price for corn in Watertown for the 4th week of August 2000. The Watertown corn bases for the 4th week of August averaged -46 cents per bushel (Table 5). On May 18, 2000, the CBOT corn futures for delivery in the months

² This section draws heavily from Flaskerud, George, Basis For Selected North Dakota Crops, North Dakota State University Extension Service, EC-1011, March 1991.

of July 2000, September 2000, and December 2000 settled at \$2.38, \$2.46, and \$2.56 respectively.

Since, during the 4th week of August 2000, the corn cash prices are to be based on the CBOT September 2000 corn futures, the appropriate contract for calculation of the expected cash price for corn is the CBOT September 2000 corn contract. We can estimate that the expected cash corn price at Watertown in the 4th week of August 2000 is going to be \$2.00 (CBOT September 2000 corn futures settle on May 18, 2000, \$2.46 minus the expected basis for 4th week of August at Watertown, \$0.46).

Similarly, on May 18, 2000, we can estimate the expected cash price for corn at Watertown for the 2nd week of November 2000 by adjusting the relevant nearby futures settle price (i.e. December 2000 CBOT corn futures) for the expected Watertown basis for the 2nd week of November 2000. On May 18, 2000, the December 2000 CBOT corn futures settled at \$2.56 and the corn bases in Watertown for the 2nd week of November averaged -53 cents per bushel (Table 5). Based on this information, on May 18, 2000, the expected cash corn price at Watertown in the 2nd week of November 2000 is \$2.03 (the CBOT December 2000 corn futures settle on May 18, 2000, \$2.56 minus the expected basis, \$0.53) per bushel.

It may be noted that the above estimates of expected cash price are based on the information available on May 18, 2000. The availability of any additional information to the market participants would change the futures price and thus the local cash price forecasts. Therefore, for successful marketing and identification of possible opportunities, it is imperative that markets be continuously monitored and price estimates and market plans be periodically updated.

These estimates were calculated by utilizing the appropriate futures price and the expected basis (based on the average of preceding five years). One could also incorporate the information on the standard deviation for the relevant weekly bases to calculate the 95 percent confidence range for the cash price estimate. For example, during the five years, the Watertown corn bases in the 4th week of August averaged -46 cents, with a standard deviation of 13.0 cents (Table 5). Therefore, the 95 percent confidence range for the Watertown basis for the 4th week of August, 1995, was from -20.0 cents (-46 plus 2 X 13.0) to -72.0 cents (-46 minus 2 X 13.0).

On May 18, 2000, the CBOT September 2000 corn contract settled at \$2.46 per bushel. On that day, we would have estimated the cash corn price in Watertown during the 4th week of August 2000 to be \$2.00 (\$2.46 - \$0.46). Incorporating the 95 percent confidence range, the cash price for corn would fall between \$1.74 (\$2.46 -\$0.72 = \$1.74) and \$2.26 (\$2.46 -\$0.20 = \$2.26).

b) Evaluating a Cash Forward Contract. Under a cash forward contract a buyer (generally a local elevator) agrees to purchase grain at a specified price at some specified time in the future. This is the most frequently used marketing tool by farmers for locking in a price for their grain which is yet to be delivered (or harvested). One way to evaluate the cash forward contract price is to compare it to the expected cash price.

Let us assume, on May 18, 2000, an elevator in Brookings was offering a cash forward contract for soybeans for delivery at the end of August 2000 at \$4.95 per bushel. On May 18, 2000, the CBOT September 2000 futures for soybeans (the appropriate futures contract on which the cash price for soybeans is based during the last week of August) was \$5.50 per bushel. The five-year average weekly soybean basis at Brookings for the last week of August is -48 cents with a standard deviation of 13 cents. Accordingly, the Brookings soybean cash price for the last week

of August is expected to be \$5.02 (\$5.50 minus \$0.48), with a 95 percent confidence range from \$4.76 (\$5.50 minus \$0.48 minus 2 X \$0.13) to \$5.28 (\$5.50 minus \$0.48 plus 2 X 0.13). Therefore, the \$4.95 cash forward contract offer was 7 cents per bushel less than the expected cash price but was within the 95 percent range. Unless the basis is expected to greatly diverge from the historical levels, the cash forward contract offers are generally at, or slightly lower than, the expected cash price based on the current futures price and the historical basis.

c. Determining the Profitability of Storage and Timing of Sale. By comparing the expected cash prices at two different times, one can calculate the carrying charge that the market is willing to pay for storing the grain for that period. For example, on May 18, 2000, we considered storing corn from the 4th week of August 2000 to the 2nd week of November 2000 at Watertown. As explained earlier, as of May 18, 2000, the cash corn price at Watertown was expected to be \$2.00 per bushel during the 4th week of August 2000 and \$2.03 per bushel during the 2nd week of November 2000. So, based on the information available on May 18, 2000, the value of corn stored from the 4th week of August 2000 to the 2nd week of November 2000 is expected to increase by 3 cents per bushel.

Obviously, storing corn over that period would be a losing proposition. The per-bushel gain of 3 cents is not going to cover the cost of storing corn for 10 weeks. In general, by calculating the expected spread in cash price at different times in the future and adjusting it for appropriate storage costs, we can determine the most profitable time for storage and sale.

d) Evaluating Basis Contract. In some areas, elevators also offer a basis contract, where the basis relative to a specific futures contract month is fixed at the time of the signing of the contract and the price is not fixed. The seller is given the discretion to price the grain within a

specified period based on the futures contract price. By comparing the contract basis with the historical basis for the location, we can determine if the basis contract offer is reasonable.

e) Establishing a Hedge Price. Hedging involves locking in a futures price but not the basis. A farmer can hedge his/her grain even before harvesting the grain by utilizing a selling hedge. Basically, it involves selling appropriate futures contract(s) as a substitute for a later sale in the cash market. After harvest, the grain is sold in the cash market and the futures contract(s) are purchased (back) to offset the previously sold futures contract(s).

For a selling hedge, the expected net hedge price is the futures price at which the futures contracts are sold plus or minus³ the expected basis minus the per bushel hedging cost (commodity broker's commission and the expected cost of interest on margin). At the time of hedging, the hedger has a knowledge of the futures price and the brokers' commission. The interest cost for the margin is difficult to predict but is usually quite small. Therefore, for a reasonable estimate of the expected hedging price, one has to be able to estimate the local cash basis at the time the hedge is to be lifted. The information on historical bases for the preceding few years can help hedgers estimate the expected basis and possible variations in the basis.

f) Calculating Minimum or Maximum Prices. Options provide additional alternatives for grain marketing to both farmers and grain traders. Purchasing options are popular with some farmers as they provide flexibility in pricing and do not require margin deposits. There are two types of options, "puts" and "calls."

³ Technically, to calculate expected hedge price, the expected basis is added to the futures contract price. Adding a negative basis results in the expected hedge price which is less than the futures contract price.

Purchasing a put option gives the purchaser the right to sell the underlying futures contract at a specific (strike) price during a certain time period. To obtain this right, the purchaser of the put has to pay a market-determined amount per bushel which is called a premium. This premium goes to the seller of the put who is obligated to guarantee the strike price to the buyer. Purchasing a put option essentially establishes a minimum selling price equal to the strike price plus or minus the expected basis, minus the premium, minus the brokerage fee, minus the interest cost on the premium. A good estimate of the basis for the time when the grain is expected to be sold in the cash market is important for calculating the minimum price that can be established through the purchase of the put. In some areas, elevators also offer a minimum price contract to farmers. A minimum price contract can be evaluated by comparing it with the minimum price that would be expected using a put.

Purchasing a call option gives the purchaser the right to purchase the underlying futures contract at a specific (strike) price during a specified time period. As with the put, to obtain this right, the purchaser has to pay a premium which goes to the seller of the call. Purchasing a call establishes a maximum purchase price equal to the strike price plus or minus the expected basis, plus the premium, plus the brokerage fee, plus the interest cost for the premium, plus an out charge if finally the grain is purchased from an elevator. Again, the accuracy of the maximum price that can be established through the purchase of a call depends upon one's ability to estimate the basis for the time period in which the actual grain purchase is expected to be made in the cash market.

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USDA, Feed Outlook, ERS-FDS-06-0600, On-line: <http://usda.mannlib.cornell.edu/reports/ersor/field/fds-bb/2000/fds0700.pdf> Washington D.C., June 13, 2000.



Fig 1. Corn Prices, 1997-99
 (Nearby CBOT Fut. Settle, Weekly)

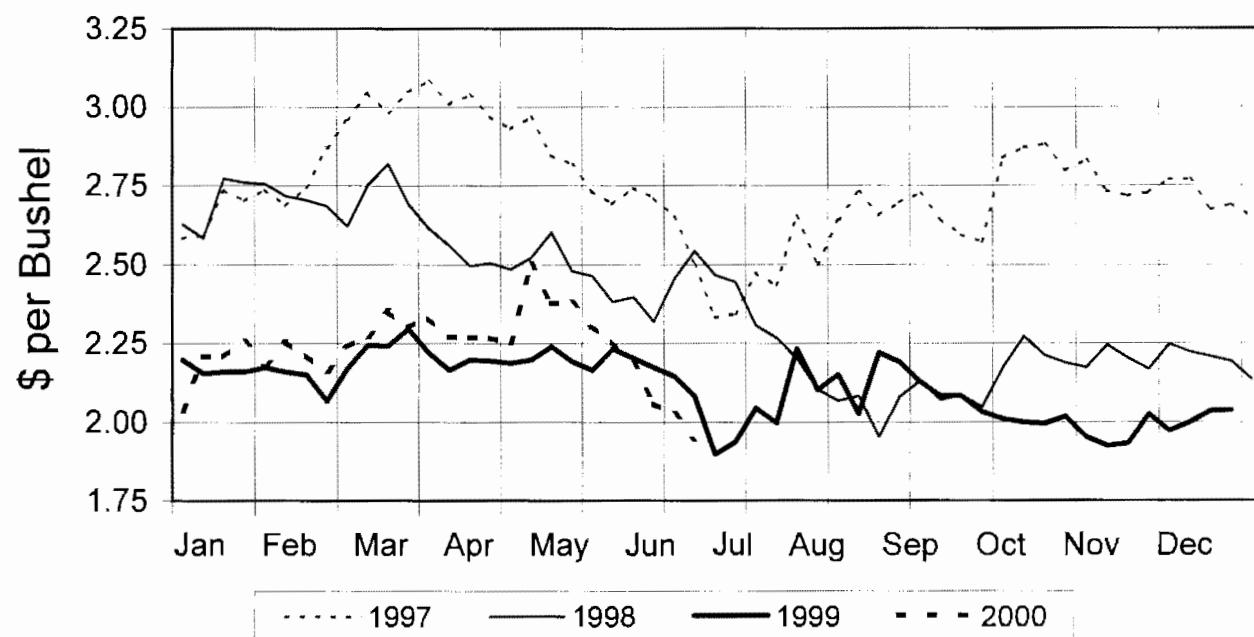


Fig 2. Corn Prices, 2000
 (Nearby CBOT Fut. & Cash, Weekly)

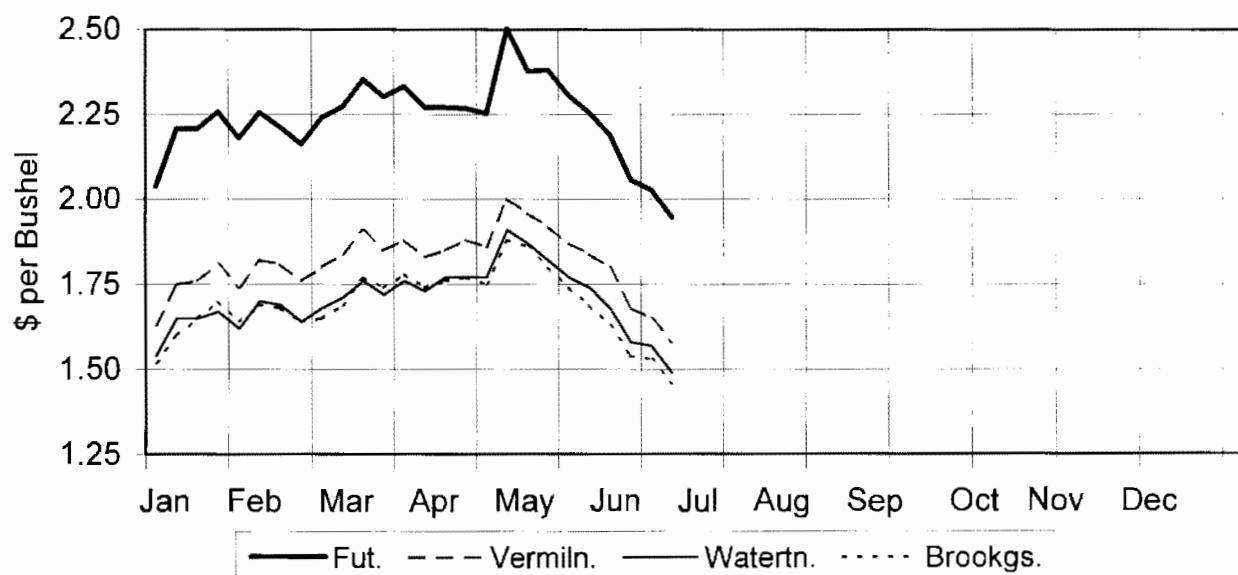


Fig 3. Corn Prices, 1999

(Nearby CBOT Fut. & Cash, Weekly)

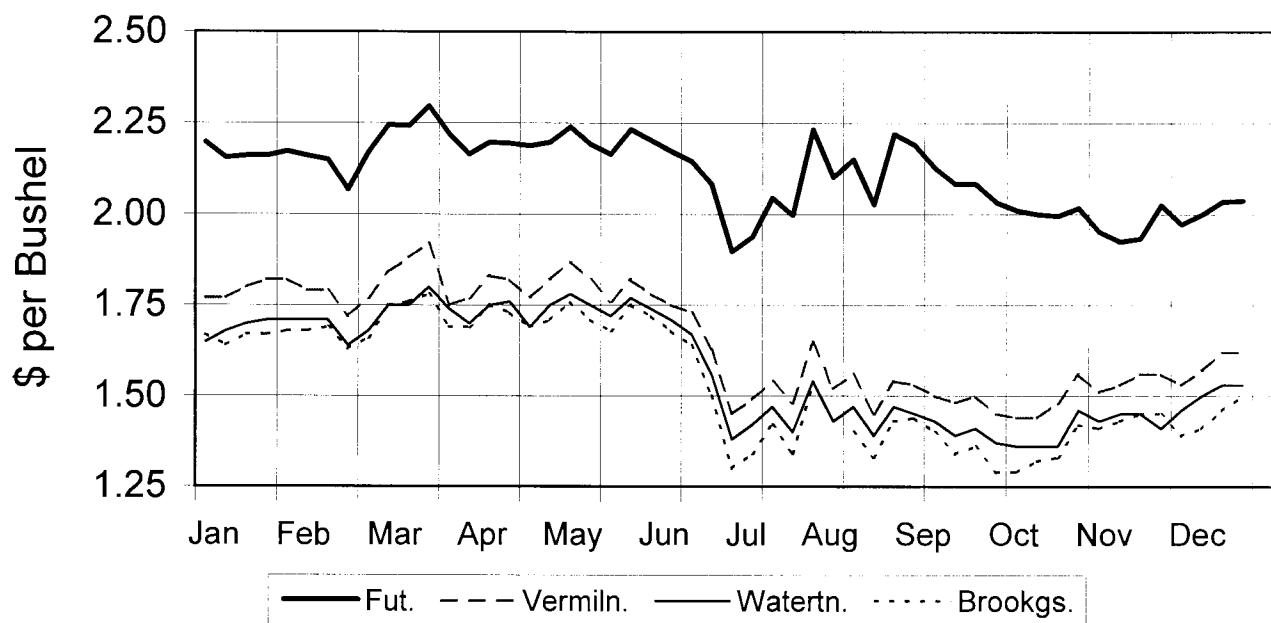


Fig 4. Sisseton Corn Basis

(Weekly, Average and Range)

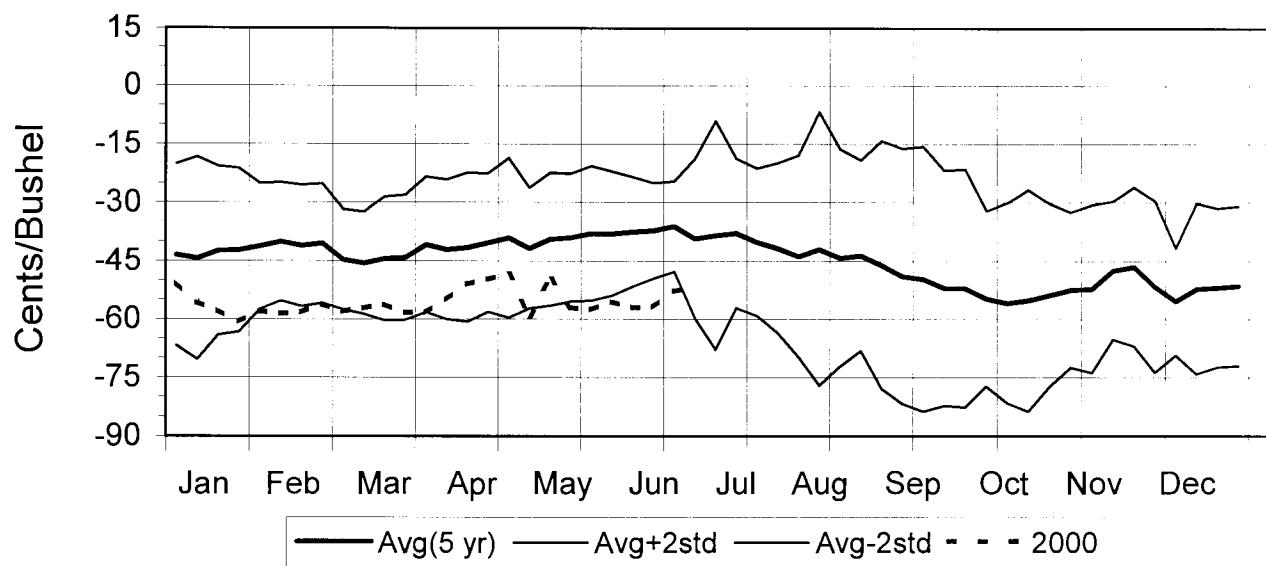


Fig 5. Watertown Corn Basis
 (Weekly, Average and Range)

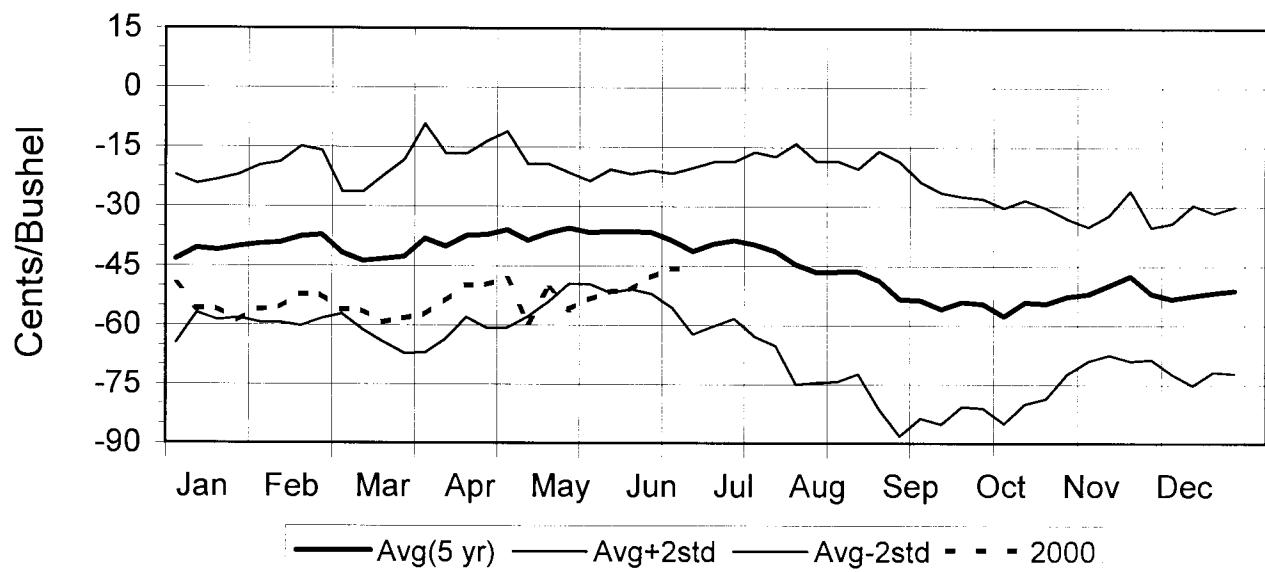


Fig 6. Brookings Corn Basis
 (Weekly, Average and Range)

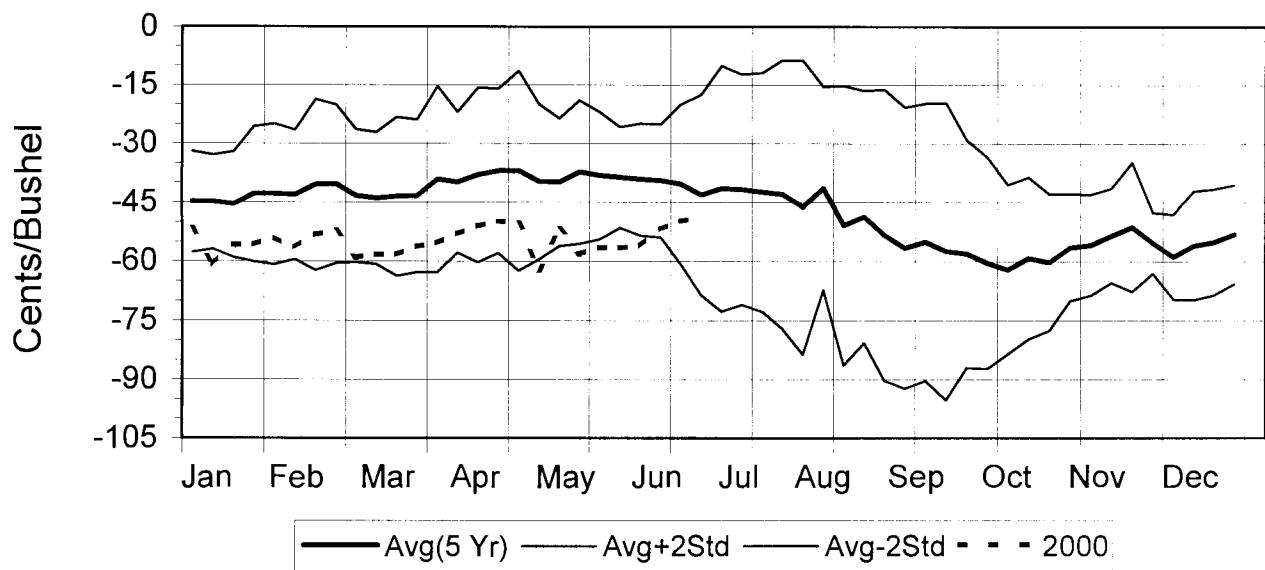


Fig 7. Madison Corn Basis
(Weekly, Average and Range)

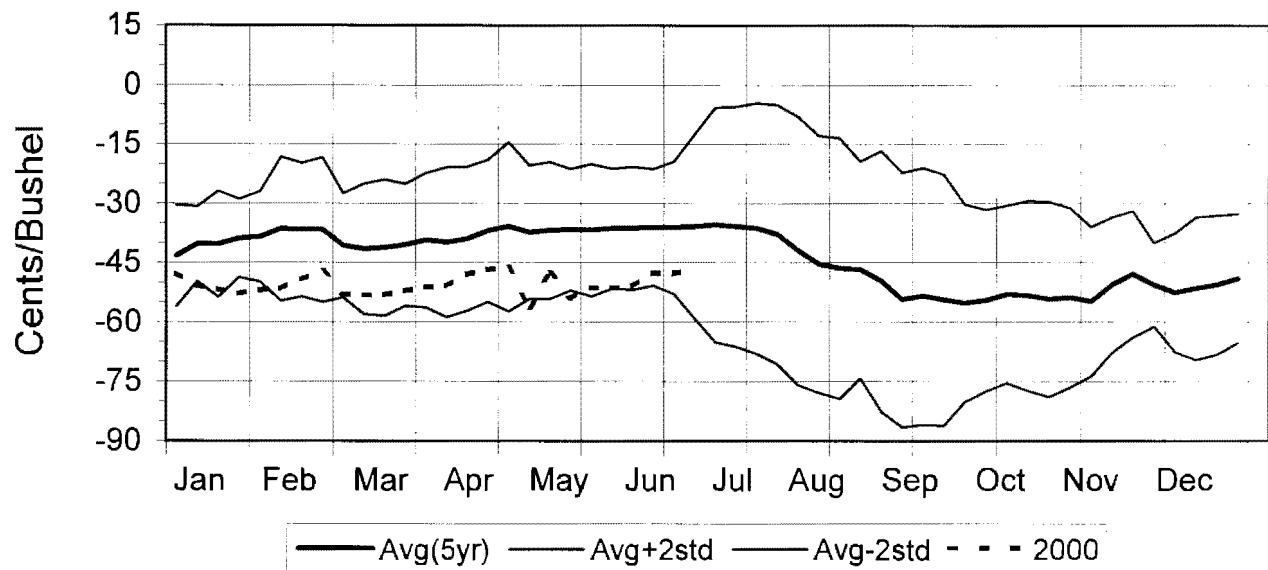


Fig 8. Vermillion Corn Basis
(Weekly, Average and Range)

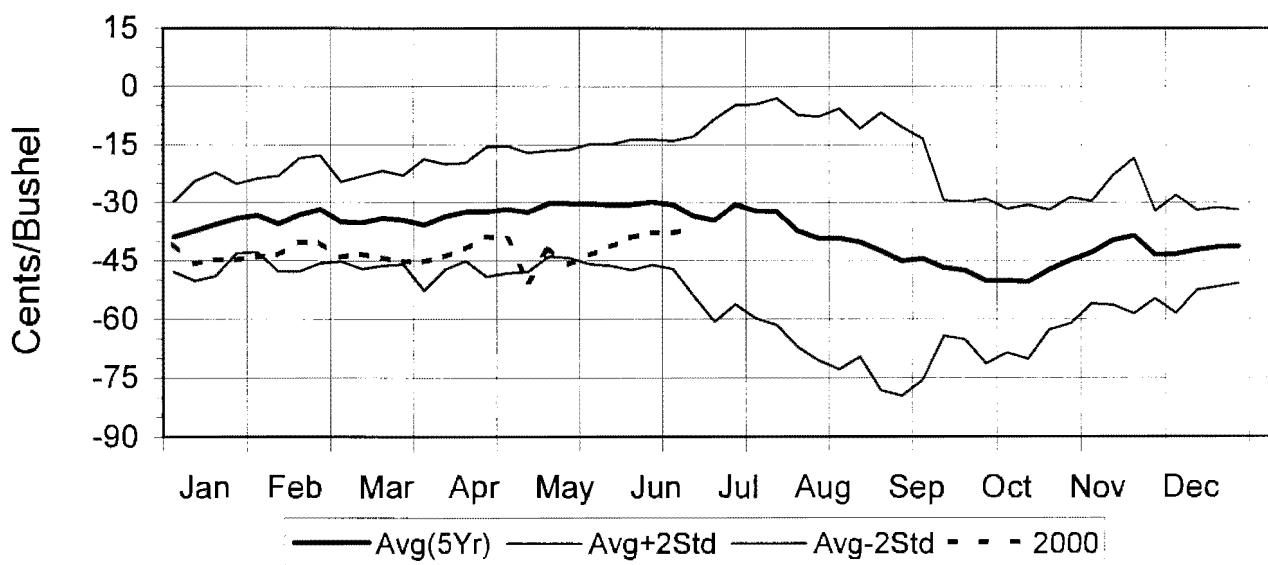


Fig 9. Canton Corn Basis
 (Weekly, Average and Range)

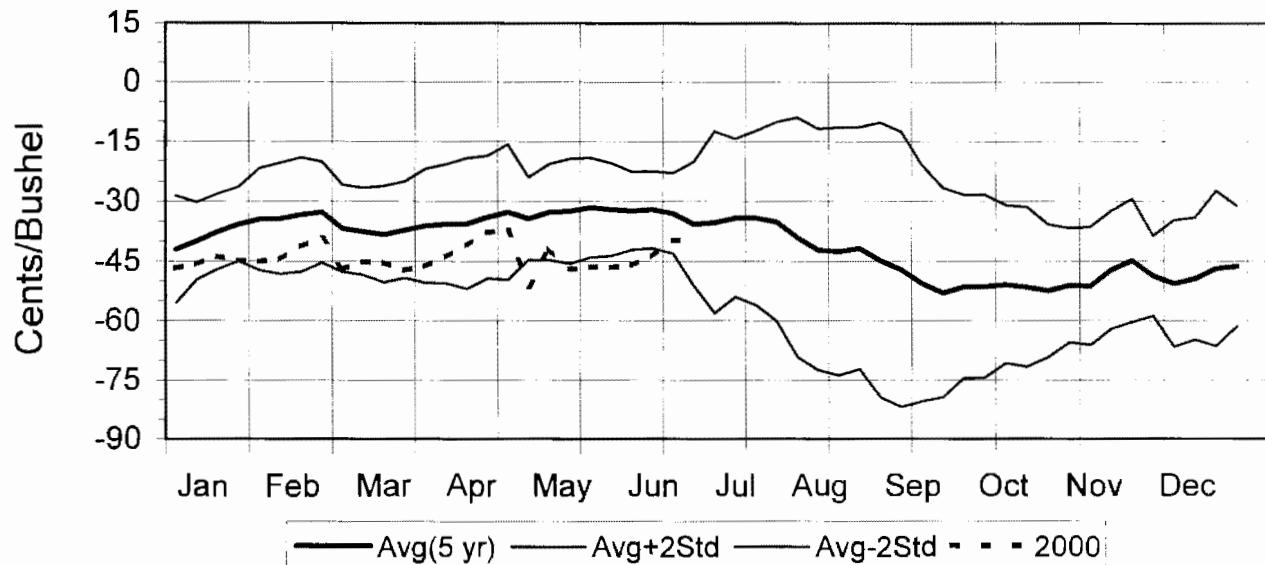


Fig 10. Mitchell Corn Basis
 (Weekly, Average and Range)

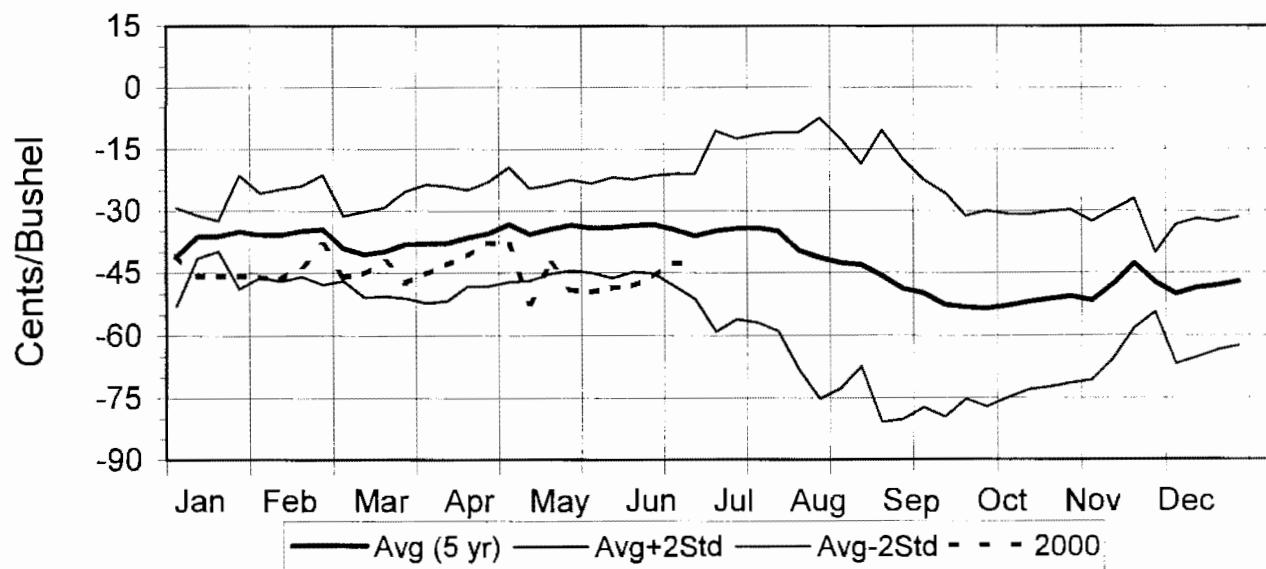


Fig 11. Soybean Prices, 1997-99
 (Nearby CBOT Fut. Settle, Weekly)

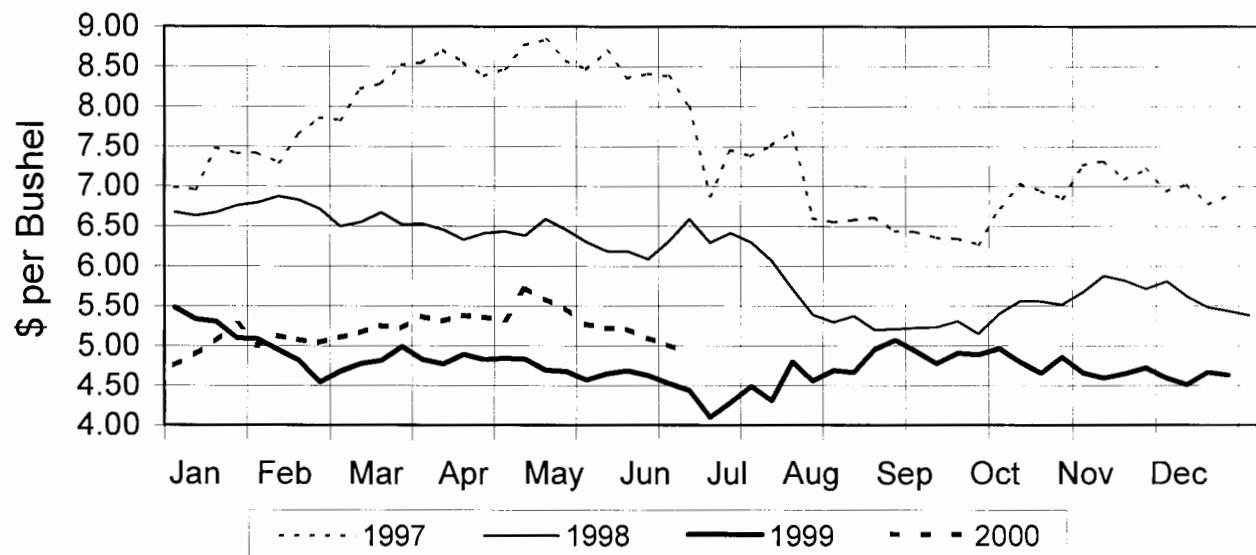


Fig 12. Soybean Prices, 2000
 (Nearby CBOT Fut. Settle & Cash, Weekly)

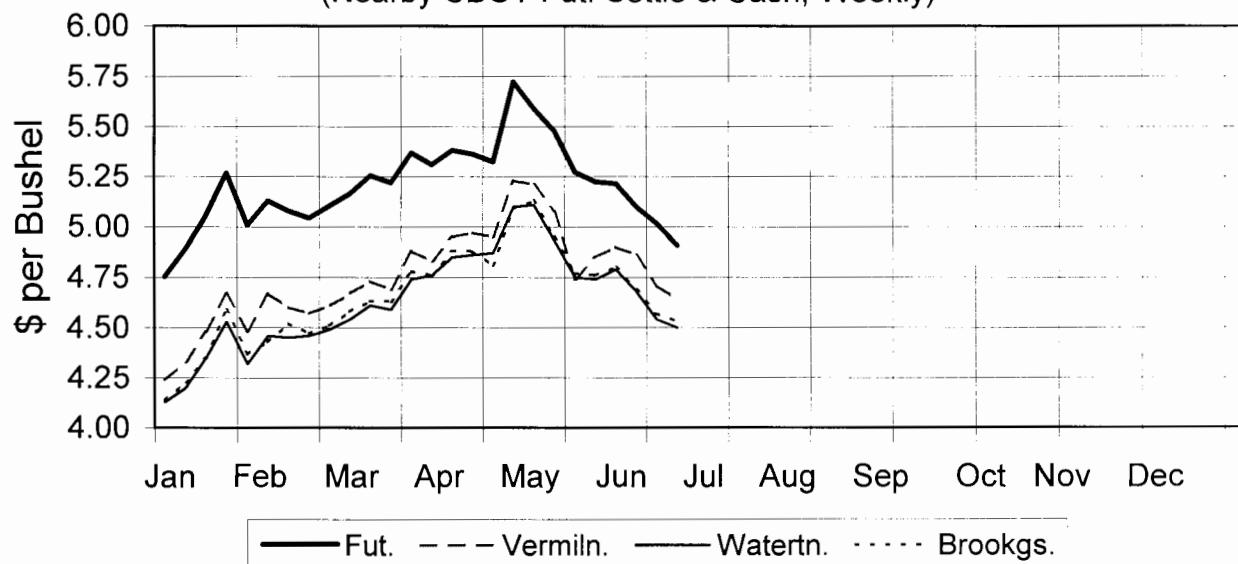


Fig 13. Soybean Prices, 1999
 (Nearby CBOT Fut. Settle & Cash, Weekly)

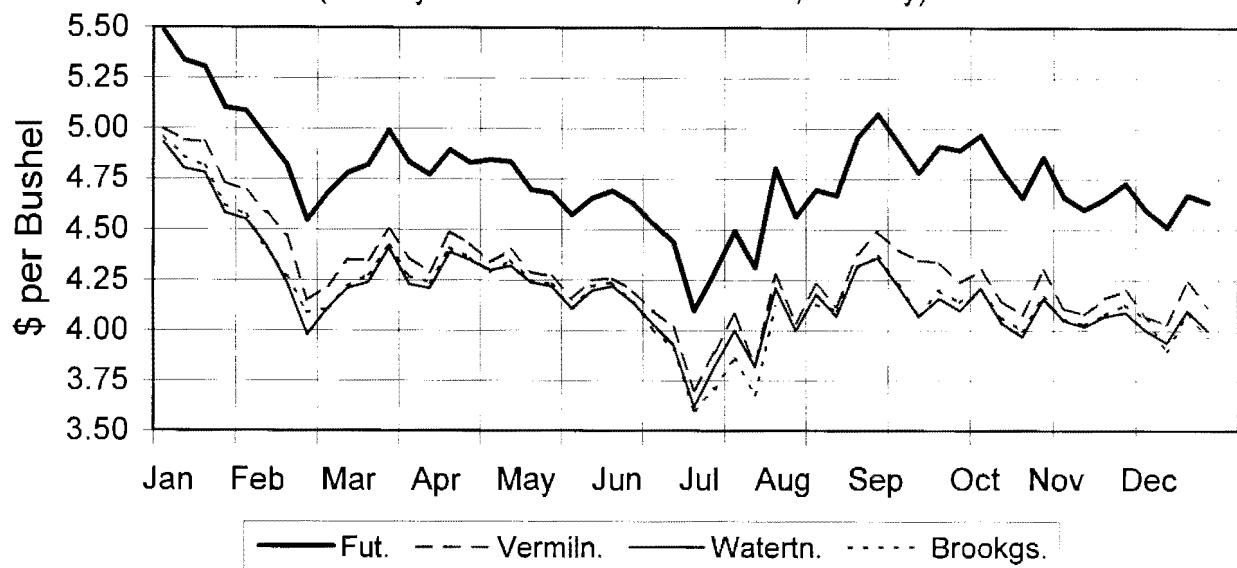


Fig 14. Sisseton Soybean Basis
 (Weekly, Average and Range)

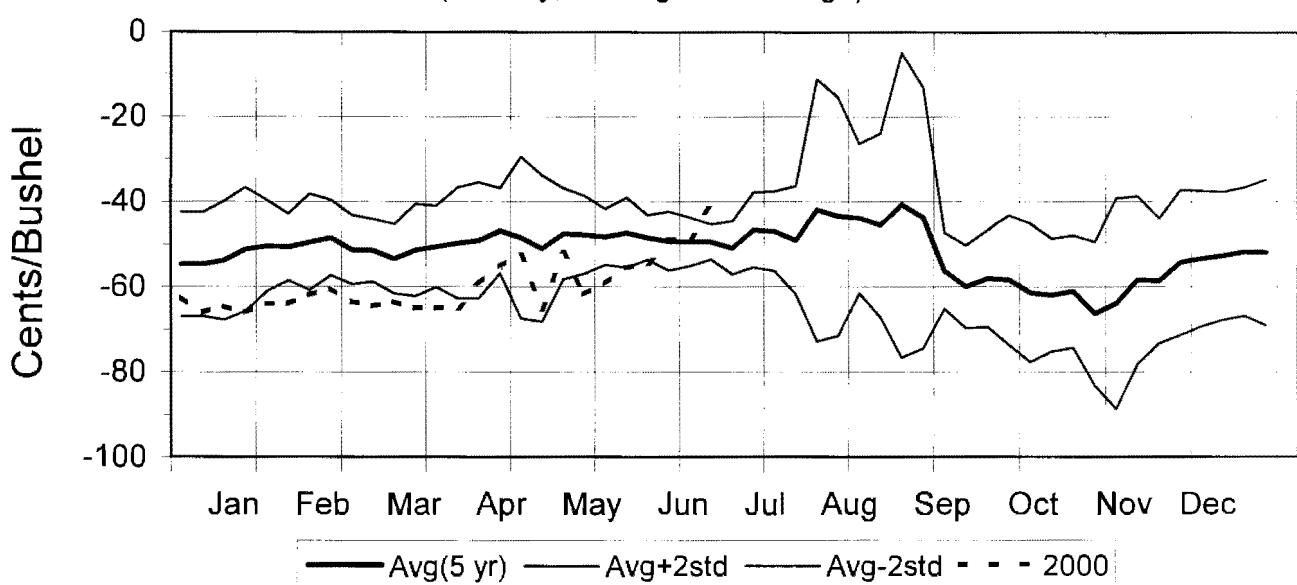


Fig 15. Watertown Soybean Basis
 (Weekly, Average and Range)

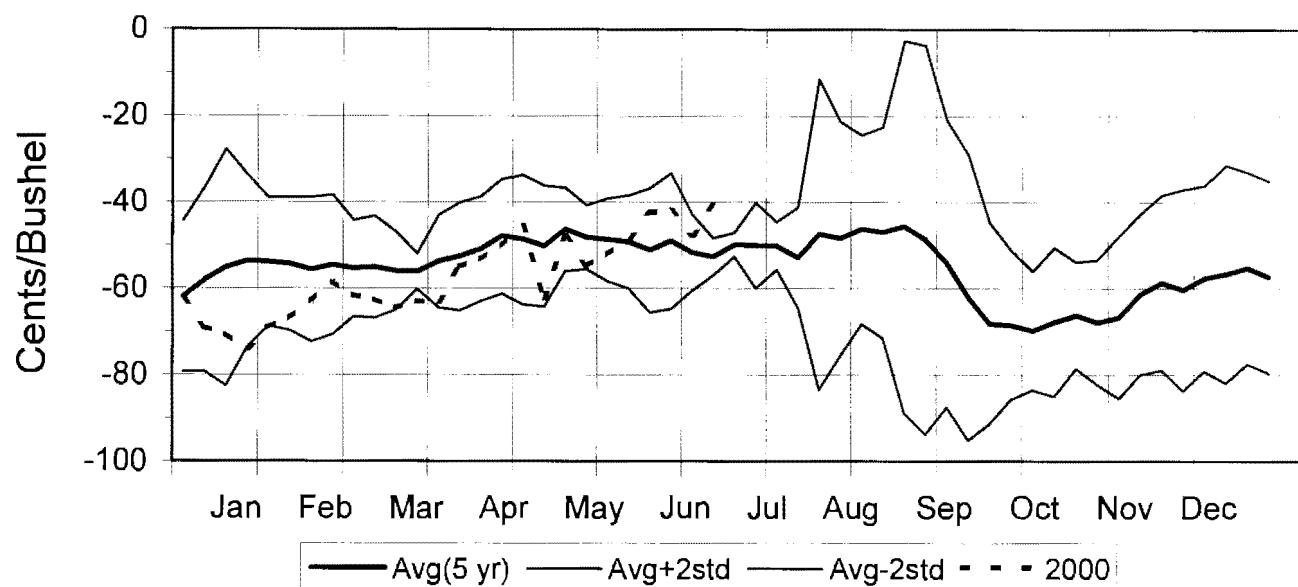


Fig 16. Brookings Soybean Basis
 (Weekly, Average and Range)

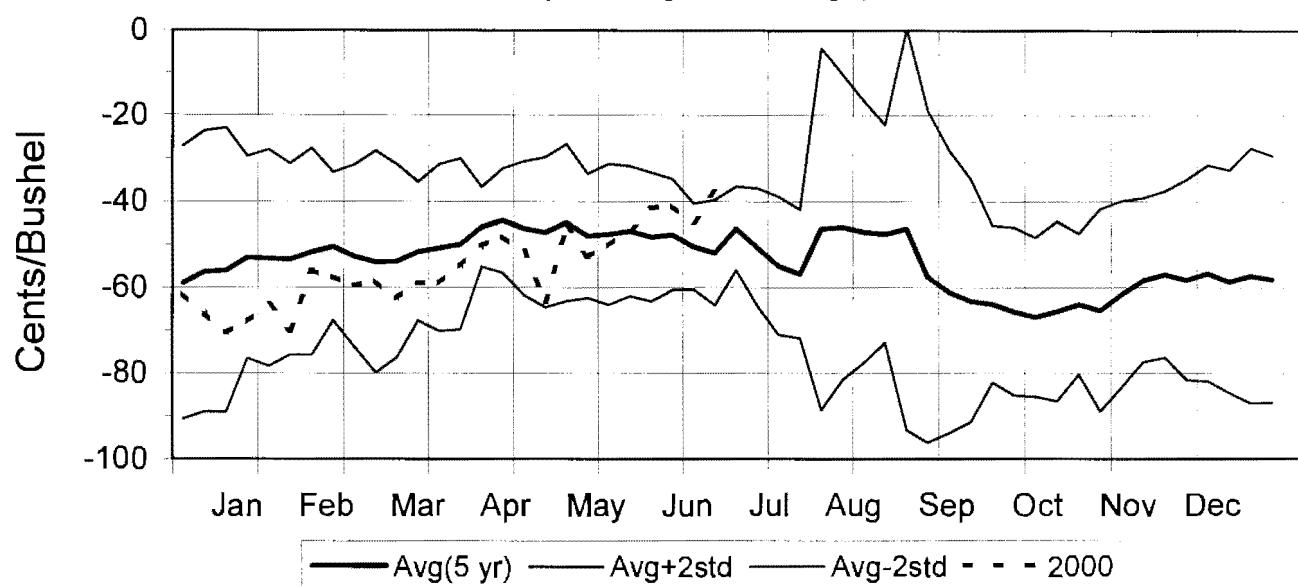


Fig 17. Madison Soybean Basis
 (Weekly, Average and Range)

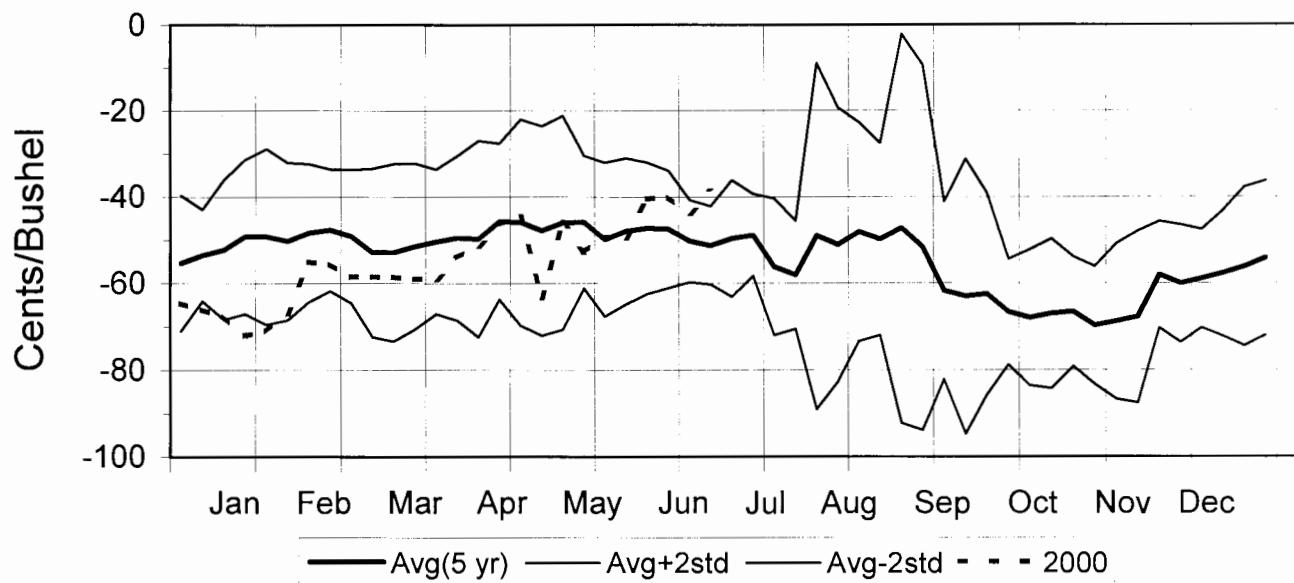


Fig 18. Vermillion Soybean Basis
 (Weekly, Average and Range)

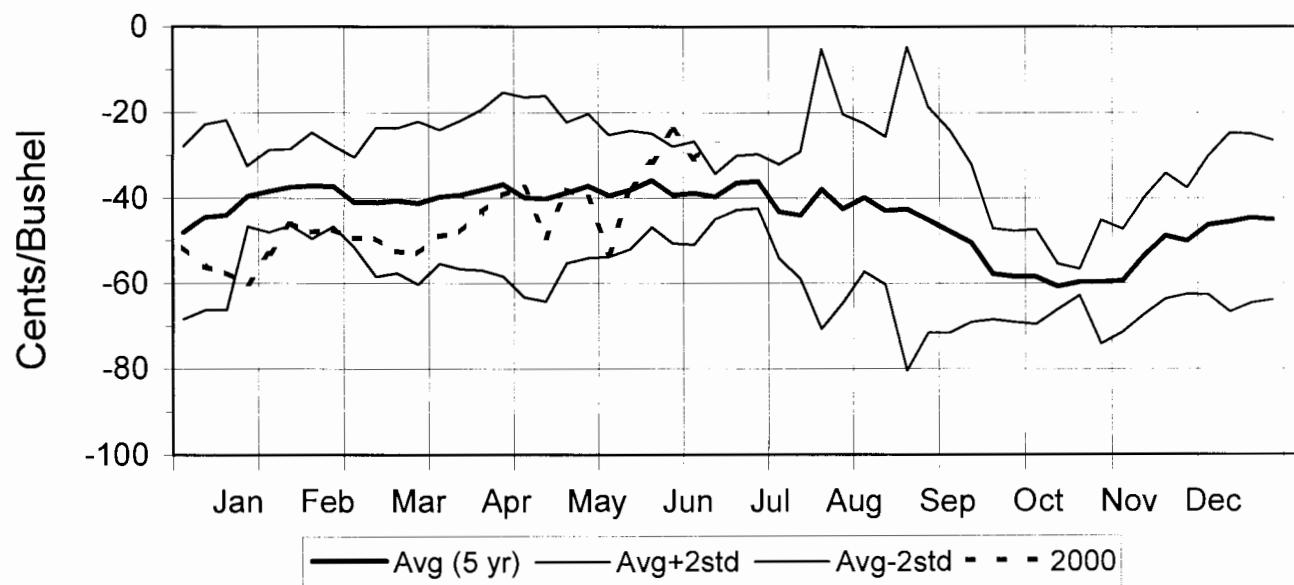


Fig 19. Canton Soybean Basis
 (Weekly, Average and Range)

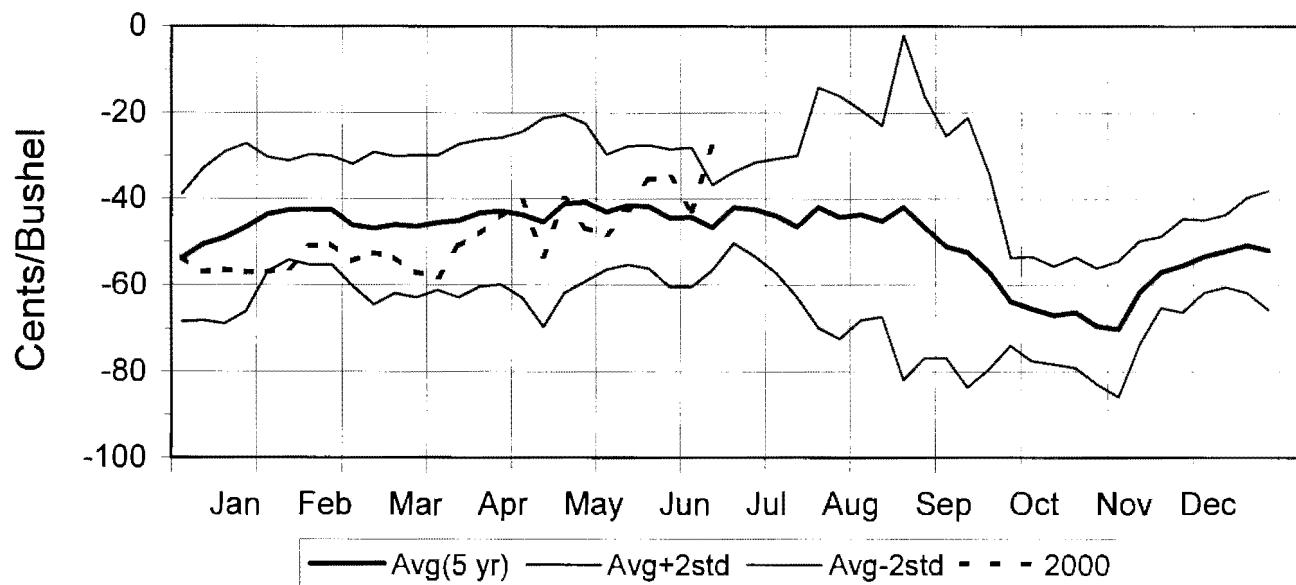


Fig 20. Mitchell Soybean Basis
 (Weekly, Average and Range)

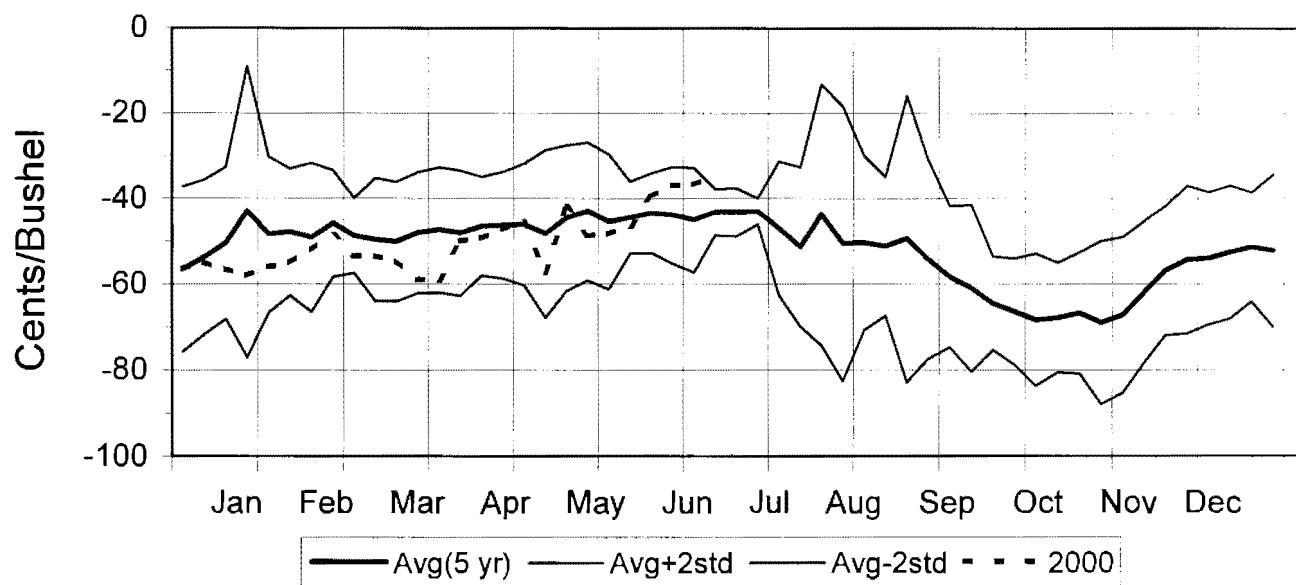


Table 2. Seasonality in South Dakota Corn Basis, 1999
 (Results of Regression Analysis)

Dependent Variable: Weekly Corn Basis (1999)
 Independent Variables: Dummy Variables for Location and Months.
 Intercept reflects Average Watertown Corn Basis of January 1999

Analysis of Variance					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>Prob>F</u>
Model	17	33591.23	1975.95	132.06	0.0001
Error	345	5162.10	14.96		
C Total	362	38753.33			
Root MSE	3.868		R-square	0.867	
Dep Mean	-51.085		Adj R-sq	0.860	
C.V.	-7.572				
Parameter Estimates					
<u>Variable</u>	<u>DF</u>	<u>Parameter Estimate</u>	<u>Standard Error</u>	<u>T for H0: Parameter=0</u>	<u>Prob > T </u>
Intercept	1	-48.17	0.83	-58.22	0.0001
Sisseton	1	-0.76	0.76	-1.00	0.3184
Brookings	1	-3.39	0.76	-4.45	0.0001
Madison	1	0.69	0.76	0.91	0.3621
Vermillion	1	8.21	0.76	10.82	0.0001
Canton	1	6.38	0.76	8.42	0.0001
Mitchell	1	6.63	0.76	8.75	0.0001
February	1	2.87	0.99	2.90	0.0039
March	1	0.12	0.99	0.12	0.9066
April	1	2.35	0.93	2.52	0.0122
May	1	2.26	0.99	2.29	0.0227
June	1	0.43	0.99	0.43	0.6646
July	1	-7.85	0.93	-8.43	0.0001
August	1	-20.96	1.00	-21.01	0.0001
September	1	-22.55	0.98	-23.06	0.0001
October	1	-15.66	0.94	-16.69	0.0001
November	1	-3.29	0.99	-3.33	0.001
December	1	-3.67	0.98	-3.75	0.0002

Table 3. Seasonality in South Dakota Corn Basis, 1998
 (Results of Regression Analysis)

Dependent Variable: Weekly Corn Basis (1998)
 Independent Variables: Dummy Variables for Location and Months.
 Intercept reflects Average Watertown Corn Basis of January 1998

Analysis of Variance					
<u>Source</u>	<u>DF</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F Value</u>	<u>Prob>F</u>
Model	17	35959.21	2115.25	171.57	0.0001
Error	351	4327.40	12.33		
C Total	368	40286.61			
Root MSE		3.511	R-square	0.893	
Dep Mean		-49.744	Adj R-sq	0.887	
C.V.		-7.059			

Parameter Estimates					
<u>Variable</u>	<u>DF</u>	<u>Parameter Estimate</u>	<u>Standard Error</u>	<u>T for H0: Parameter=0</u>	<u>Prob > T </u>
Intercept	1	-48.63	0.74	-65.46	0.0001
Sisseton	1	-0.19	0.69	-0.27	0.7851
Brookings	1	-0.98	0.68	-1.44	0.1512
Madison	1	0.92	0.68	1.36	0.1761
Vermillion	1	8.85	0.69	12.92	0.0001
Canton	1	5.53	0.68	8.11	0.0001
Mitchell	1	4.66	0.68	6.83	0.0001
February	1	4.23	0.89	4.75	0.0001
March	1	1.04	0.89	1.17	0.2430
April	1	6.96	0.84	8.30	0.0001
May	1	6.41	0.89	7.20	0.0001
June	1	5.28	0.89	5.93	0.0001
July	1	-2.03	0.84	-2.42	0.0162
August	1	-3.36	0.89	-3.78	0.0002
September	1	-18.42	0.90	-20.48	0.0001
October	1	-19.71	0.84	-23.48	0.0001
November	1	-12.60	0.90	-14.01	0.0001
December	1	-12.16	0.84	-14.48	0.0001

Table 12. Seasonality in South Dakota Soybean Basis, 1999
 (Results of Regression Analysis)

Dependent Variable: Weekly Soybean Basis (1999)
 Independent Variables: Dummy Variables for Location and Months.
 Intercept reflects Average Watertown Soybean Basis of January 1999

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	17	25651.68	1508.92	78.59	0.0001
Error	345	6623.61	19.20		
C Total	362	32275.29			
Root MSE	4.382		R-square	0.795	
Dep Mean	-54.546		Adj R-sq	0.785	
C.V.	-8.033				
Parameter Estimates					
Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T
Intercept	1	-51.60	0.94	-55.05	0.0001
Sisseton	1	0.15	0.86	0.18	0.8571
Brookings	1	0.27	0.86	0.31	0.7555
Madison	1	-0.31	0.86	-0.36	0.7205
Vermillion	1	10.08	0.86	11.73	0.0001
Canton	1	4.50	0.86	5.24	0.0001
Mitchell	1	5.29	0.86	6.15	0.0001
February	1	-0.72	1.12	-0.65	0.5183
March	1	-4.71	1.12	-4.21	0.0001
April	1	-1.72	1.06	-1.63	0.1048
May	1	3.72	1.12	3.33	0.0010
June	1	2.21	1.12	1.98	0.0485
July	1	-2.36	1.06	-2.24	0.0260
August	1	-8.93	1.13	-7.90	0.0001
September	1	-16.23	1.11	-14.65	0.0001
October	1	-22.54	1.06	-21.21	0.0001
November	1	-10.34	1.12	-9.25	0.0001
December	1	-7.36	1.11	-6.65	0.0001

