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## A Strategy for Contracting Soybeans for Harvest Delivery

University of Tennessee Agricultural Experiment Station

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Bulletin 591

July 1979

# A Strategy for Contracting Soybeans for Harvest Delivery

Charles Sappington

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# A Strategy for Contracting Soybeans for Harvest Delivery

by

Charles Sappington\*

**C**ontract buying and selling of soybeans began for Tennessee producers in about 1966. Today, essentially all soybean handling firms have such contracts available and many producers use these contracts to fix the price of their soybeans. A signed contract establishes the price at which the soybeans will be sold at some specified future time. If the future time is next harvest, the contracts are available at some 15 to 50¢ per bushel below the November futures price on the Chicago Board of Trade. The 15 to 50¢ is the expected November basis<sup>1</sup> for that particular firm and, for any one firm, the basis tends to remain constant while the November futures price varies to change the contract price.

The so called "life of the contract" is about a year for soybeans; for example, the November, 1979, contract was first traded in November, 1978, and trading will cease during November, 1979. Thus, starting in November before planting and extending until harvest time, the soybean producer is faced daily with this incredibly difficult and important marketing decision: to accept or reject the contract price. To accept the price is to remove all concern about changes in soybean prices—to remove the hope of price increases and the fear of price decreases. To reject the offered price is to continue speculating on a price rise always with the fear of a price decrease.

While the past may not be the best guide for the future, it is one of the few guides available in formulating a marketing strategy. A look at the price behavior of past years might be helpful in evaluating alternative marketing plans and thus selecting some plan for use in the future.

The 1972-73 marketing year was a landmark year for soybean prices. Soybean prices moved from the \$3.00/bu. area to the current \$5.00/bu. and up level. Therefore, the analysis begins with the 1973 November futures contract which had a life of contract almost identical with the 1972-73 marketing year.

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<sup>1</sup>The elevator expects the local cash soybean price to be 15 to 50¢ under the November futures price at harvest.

## Price Behavior of November Soybean Futures Contract 1973-1978

Monthly bar charts for November soybean futures contract prices are shown in Figures 1 through 6. Figure 1 is a bar chart for the landmark year of 1973. The November contract opened in September, 1972, at \$3.23 (the tickmark to the left of the vertical bar), traded in a range of \$3.23 to \$3.35 as indicated by the vertical bar and closed the month at the high of \$3.35 (the tickmark to the right). In October, 1972, the November soybean contract opened at \$3.31, traded in a range of \$3.24 to \$3.39 and closed at \$3.34. A glance at Figure 1 indicates that November, 1973, soybean futures prices rose gradually through April, 1973, and then rose rapidly to peak in August at \$9.29 before falling rapidly to close on November 20, 1973, at \$5.68. Figure 2 gives the price record of the November, 1974, futures contract. The opening price in September, 1973, was \$6.20. There was a small price decline into 1973 harvest. The contract traded from \$5.10 to \$6.66 between harvest, 1973, and July, 1974, and then prices rose rapidly to peak at \$9.56 in October, 1974, before falling to close at \$7.25 on November 19, 1974. The 1975 contract for November soybeans (Figure 3) indicates the peak price in October, 1974, of \$8.69 and then generally weaker prices all year. The November, 1976, contract (Figure 4) traded from a low of \$4.83 to a high of \$7.77 in July, 1976, while the November, 1977, contract (Figure 5) peaked in July, 1977, at almost \$8.00 before falling to a low of \$5.00 in September, 1977. The November, 1978, contract (Figure 6) had its low of \$5.35 in October, 1977, and a high of \$7.17 in October, 1978.

A careful study of Figures 1-6 reveals no firm rule for contracting during any one particular month. The November, 1975, contract peaked at harvest 1974; all other contracts reached their peaks during the growing season after May. It would have been wise to contract 1975 soybeans early in the life of the 1975 contract and wise to wait until after planting to contract in 1973, 1974, 1976, 1977, and 1978. Some strategy that would have led to contracting early in 1975 and late in the other years might be a good one for future use.

One observation might be useful in the development of such a strategy: in each of the 6 years, November futures prices were traded in the \$6 to \$7 range. This observation does not prove that all future November soybeans contracts will trade in the \$6 to \$7 range but it does suggest that \$6 to \$7 soybeans are a distinct possibility for 1979 and 1980 November contracts.

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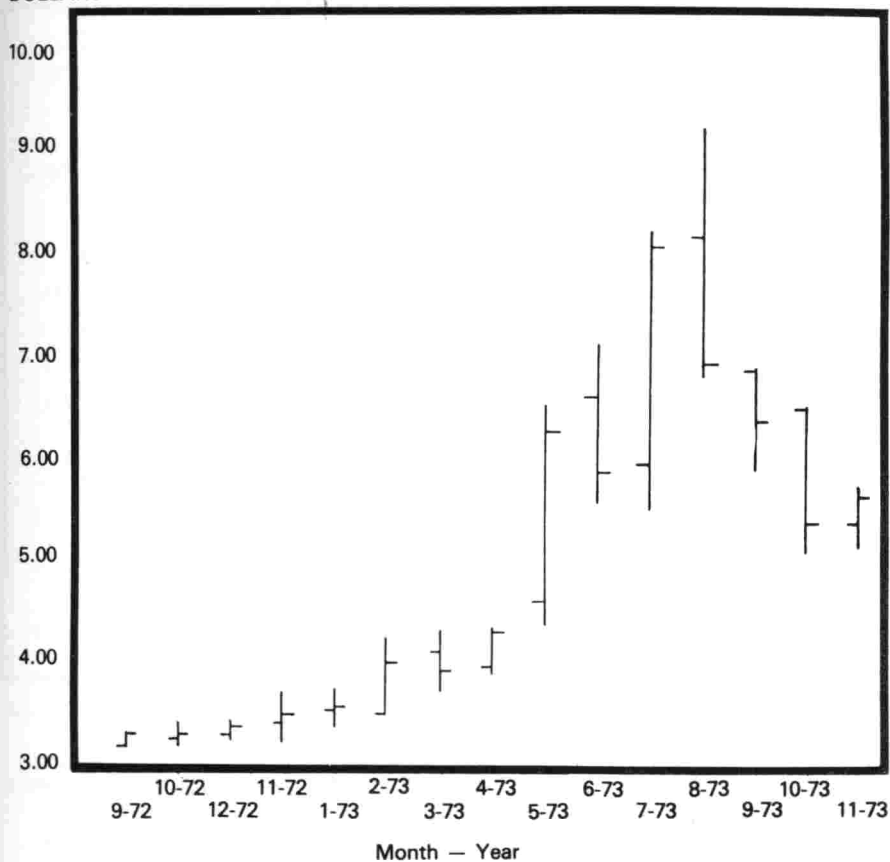


Figure 1. Open, high, low and close by months November 1973 soybeans futures contract.

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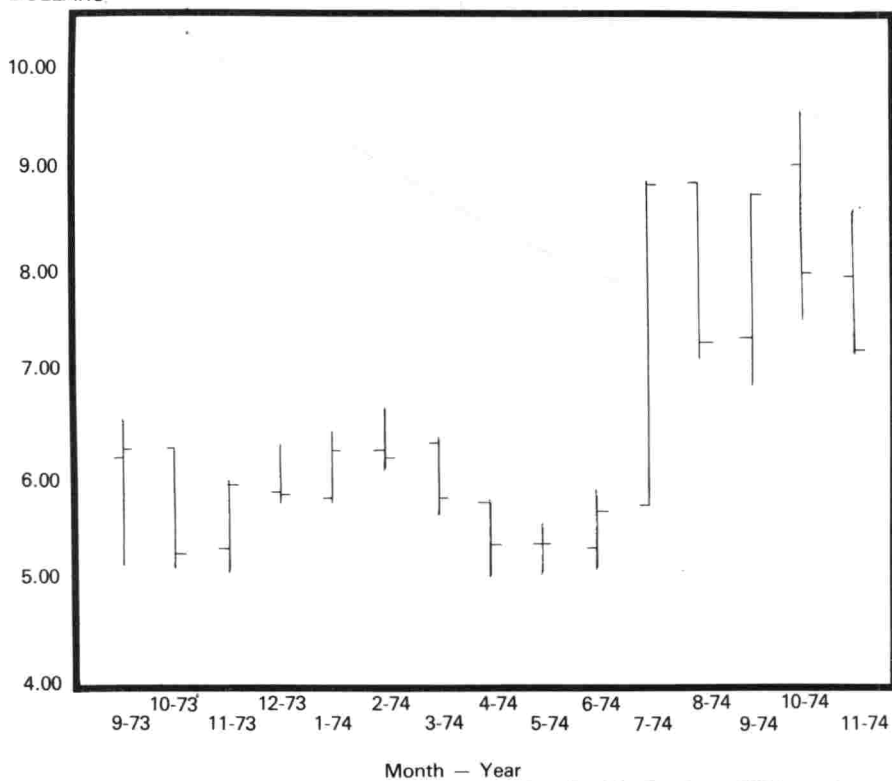


Figure 2. Open, high, low and close by months November 1974 soybeans futures contract.

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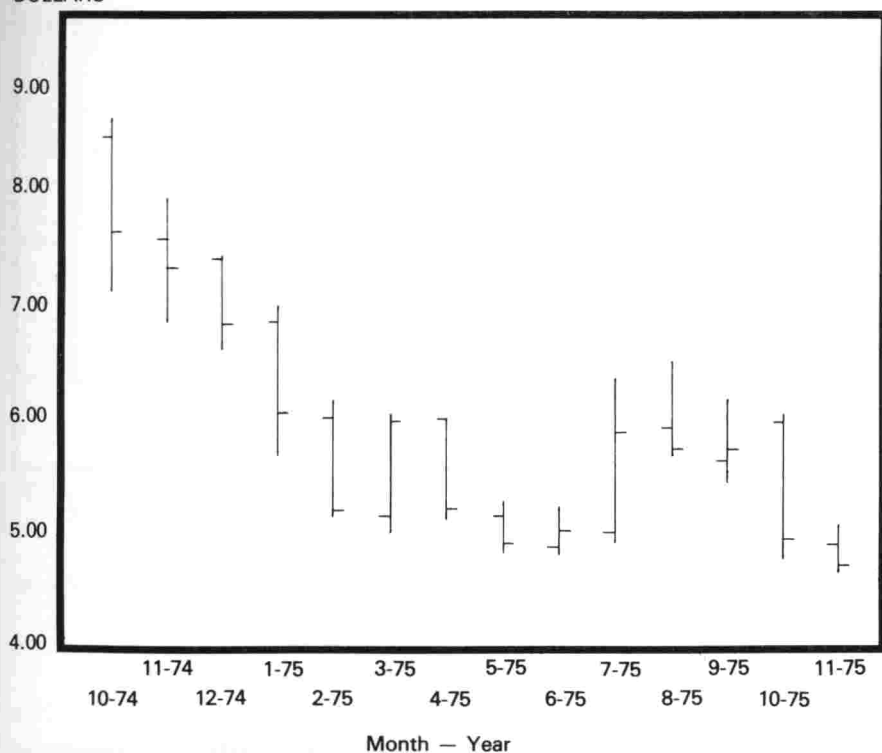


Figure 3. Open, high, low and close by months November 1975 soybeans futures contract.



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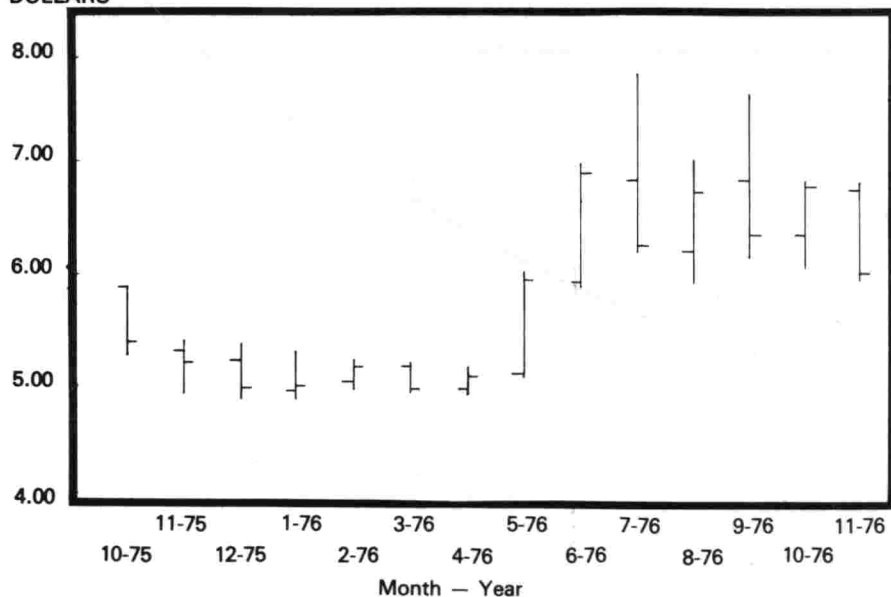


Figure 4. Open, high low and close by months November 1976 soybeans futures contract.

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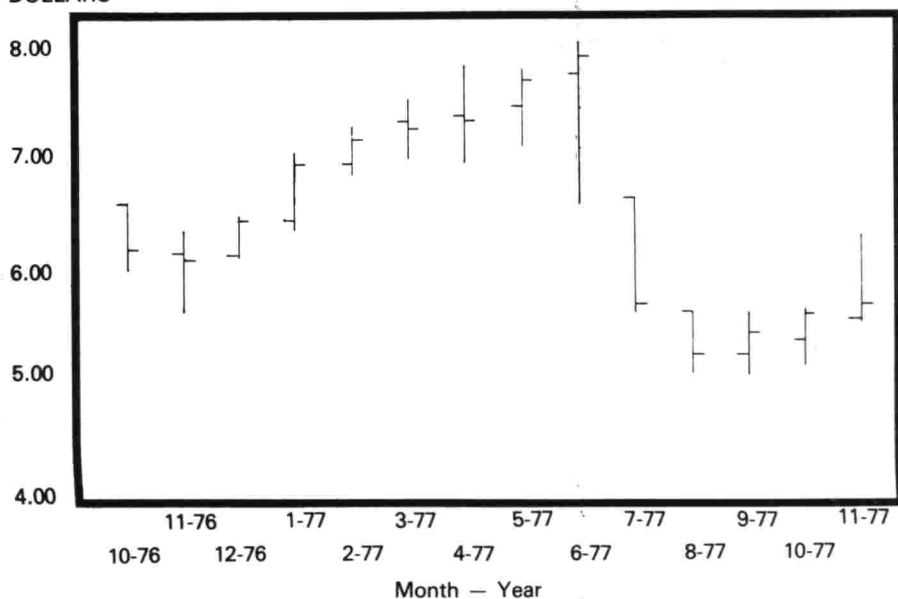


Figure 5. Open, high, low and close by months November 1977 soybeans futures contract.

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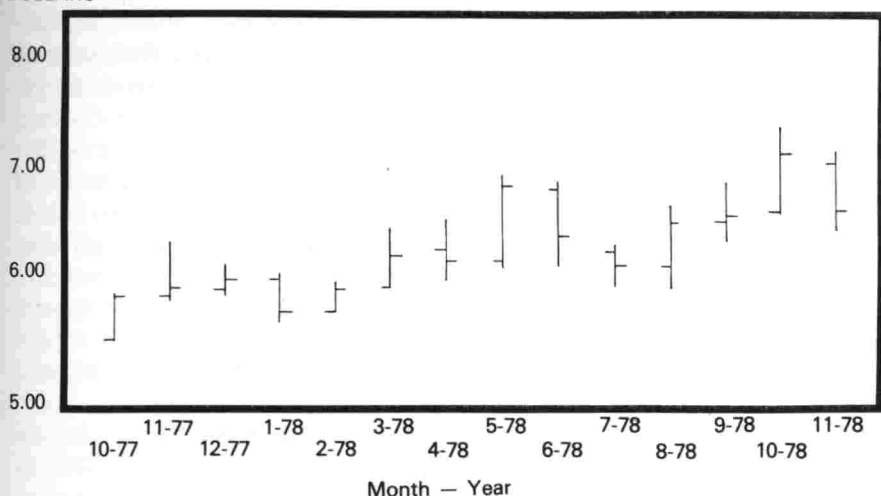


Figure 6. Open, High low and close by months November 1978 soybeans futures contract.

### Development and Testing of Strategies for Contracting Soybeans

One desirable attribute of a contracting strategy is that it be simple to understand and use. Another is that it results in higher than average, reasonably stable prices. There can be no one best marketing strategy for all producers since the ability and willingness to accept price risk varies widely among producers. A younger farmer with a large debt load will likely need a more conservative strategy than an older farmer with little or no debts and less financial vulnerability. For this reason, several strategies, all similar, are presented and tested on 1974-78 data. The November 1973 contract is not included in the analysis since that was the "landmark year." That is, no one had any historical reason to expect \$6.00 soybeans until after the fact. The rationale for all strategies rests on the observation that November soybeans futures prices have traded above \$6 in each of the last 6 years.

**Strategy 1.** This strategy assumes that the producer feels confident that a \$6.00 price for November soybean futures is a realistic expectation. The producer would like to contract when Chicago futures are over \$6.00 but \$6.00 is satisfactory. Given a \$6.00 November futures price, the local price would be \$5.50 to \$5.85 depending on the local basis. The rule is to wait for a close of the Chicago November soybean future at \$6.00 or above. The first plan under Strategy 1 is to contract anytime November futures close above \$6.00.

The next seven plans of Strategy 1 are more complicated. A close above \$6.00 means only that these next seven plans would be activated. If the Chicago close subsequently drops a specified amount after being \$6.00 or above, then the contract will be signed to fix the local selling price. The logic behind waiting for a drop in Chicago prices is that the futures price may keep going up in which case the producer would want to wait for the higher quote. In the parlance of the trade, this is sometimes called a "trailing stop loss sell, close only," at a stated price below the current life of contract high (See Figure 7). It is called trailing since if the market closes at a new life of the contract high close, the stated price is moved up to the specified amount below the new high. Since there is no way to know how large a drop should be specified, drops of 10¢ through 70¢ were tried in 10¢ increments; Strategy 1, thus, has eight different plans.

Using the 1974 November soybeans contract as an example, the contract closed on the first day of trading (September 5, 1973) at \$6.20 to activate Strategy 1. The \$6.20 close would mean to contract at the local price on that day. The \$6.20 figure is recorded in Table 1 under the zero drop for Strategy 1 with the \$6.00 activating level. The local contract would have been signed at a local price of 15

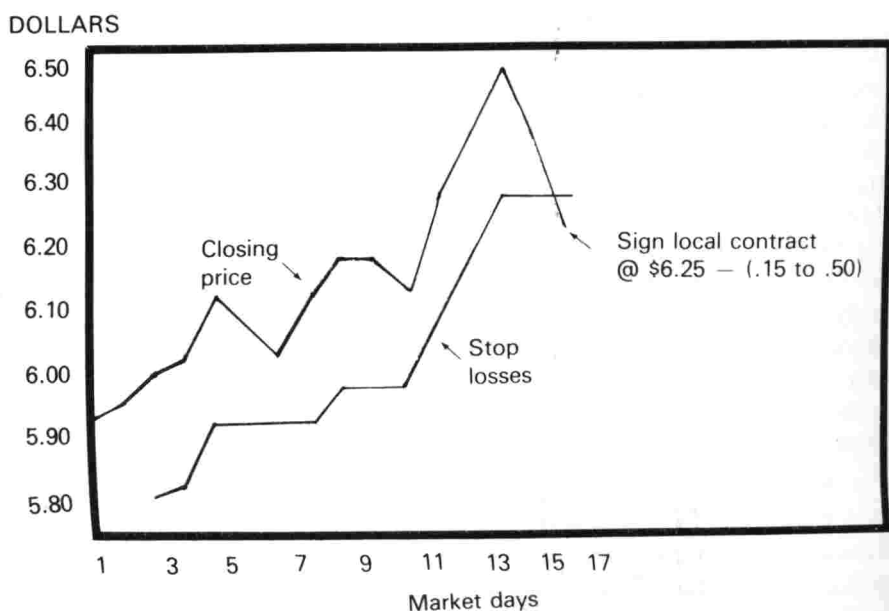


Figure 7. Hypothetical results of using a trailing stop loss, close only at 20 cents below the life of contract high close with a \$6.00 activating price.

to 50¢ below the \$6.20 figure. The rule of contracting if Chicago futures drop to close at \$6.10 or below would have been activated the next day at \$6.10. This \$6.10 is recorded in Table 1 under Strategy 1 with a 10¢ stop loss or specified drop. The 20¢ stop loss would have been touched on September 10, 1977, at a \$6.00 close. The \$6.00 figure is recorded for Strategy 1 by the 20¢ below stop loss. The 30¢ stop loss was reached on September 12, 1977, at a close of \$5.83 which is also recorded in Table 1. The market then rose to a new life of contract high close of \$6.56 on September 25, 1973, without going down 40¢. The 40¢ stop loss would now be moved up to \$6.16. The market dropped from a close of \$6.20 on October 1, 1977, to close at \$6.00 the next day. Thus, the 40¢ stop was hit and the \$6.00 result recorded in Table 1. The market continued to fall in October, 1977, reaching 70¢ under the life of the contract high close at \$5.71 on October 16, 1977. This exhausted all the plans under Strategy 1.

**Strategy 2.** Strategy 2 is exactly like Strategy 1 except that a price of \$6.50 is substituted for the \$6.00 figure of the previous strategy. This strategy would have been activated during the life of the November, 1974, contract by the close at \$6.56 on September 25, 1973 (Table 1, zero drop). As can be seen in Figure 2, the futures prices were quite weak in October, 1973, and all plans using all specified drops were completed by mid October, 1973, at prices recorded in Table 1.

Table 1. November Soybean Futures Closing Prices on Day of Simulated Local Contracting of Soybeans, 1974 contract

Specified drop or stop loss level	Activating level				
	\$60.00 Strategy 1	\$6.50 Strategy 2	\$7.00 Strategy 3	\$7.50 Strategy 4	\$8.00 Strategy 5
	-----\$ /bu.-----				
zero	6.20	6.56	7.12	7.64	8.05
\$.10	6.10	6.36	8.66	8.66	8.66
.20	6.00	6.36	8.66	8.66	8.66
.30	5.83	6.20	8.46	8.46	8.46
.40	6.00	6.00	8.46	8.46	8.46
.50	6.00	6.00	8.26	8.26	8.26
.60	5.93	5.93	8.26	8.26	8.26
.70	5.71	5.71	8.14	8.14	8.14

**Strategy 3.** This strategy is similar to the other two except that an expectation of \$7.00 soybeans is used to activate the plan. The November, 1974, soybean futures closed above \$7.00 for the first time on July 18, 1974. The market went essentially straight up to \$8.86 on July 31, 1974, thus only the zero drop plan called for signing the contract. The market then went straight down to \$7.94 on August 9, 1974, so that all stops were exhausted. The resulting Chicago closes for plan are recorded in Table 1.

**Strategy 4.** This strategy uses a November soybeans futures closing price of \$7.50 to activate the strategy with the same eight plans. The results in Table 1 indicate results identical with those of Strategy 3 (a \$7.00 activating point) for 1974 except for the zero drop plan.

**Strategy 5.** Strategy 5 uses an \$8.00 November futures close as the activating level. The results for 1974 are identical with those of the \$7.00 and \$7.50 strategies as shown in Table 1 except for the zero drop plan.

The five strategies were simulated for the November contracts of 1975-78 and the results recorded in Tables 2-5. All reported results were simulated as was done for 1974. In the case of the \$8.00 activating level, November soybean futures prices did not reach that level in the lives of the 1976, 1977 or 1978 contracts. The November, 1978, contract never did reach the \$7.50 level, and first reached the \$7.00 level on October 26, 1978. In these cases, the October 15, or

Table 2. November Soybean Futures Closing Prices on Day of Simulated Local Contracting of Soybeans, 1975 contract

Specified drop or stop loss level	Activating level				
	\$6.00 Strategy 1	\$6.50 Strategy 2	\$7.00 Strategy 3	\$7.50 Strategy 4	\$8.00 Strategy 5
			\$/bu.		
zero	8.01	8.01	8.01	8.01	8.01
\$.10	8.44	8.44	8.44	8.44	8.44
.20	8.24	8.24	8.24	8.24	8.24
.30	8.24	8.24	8.24	8.24	8.24
.40	8.04	8.04	8.04	8.04	8.04
.50	8.04	8.04	8.04	8.04	8.04
.60	7.90	7.90	7.90	7.90	7.90
.70	7.74	7.74	7.74	7.74	7.74

Table 3. November Soybean Futures Closing Prices on Day of Simulated Local Contracting of Soybeans, 1976 contract

Specified drop or stop loss level	Activating level				
	\$6.00 Strategy 1	\$6.50 Strategy 2	\$7.00 Strategy 3	\$7.50 Strategy 4	\$8.00 Strategy 5
	----- \$/bu. -----				
zero	6.15	6.61	7.07	7.59	6.21
\$.10	5.88	6.68	7.30	7.40	6.21
.20	6.54	6.54	7.29	7.29	6.21
.30	6.54	6.54	7.29	7.29	6.21
.40	6.35	6.35	7.11	7.10	6.21
.50	6.35	6.35	6.93	6.93	6.21
.60	6.93	6.93	6.93	6.93	6.21
.70	6.73	6.73	6.73	6.73	6.21

Table 4. November Soybean Futures Closing Prices on Day of Simulated Local Contracting of Soybeans, 1977 contract

Specified drop or stop loss level	Activating level				
	\$6.00 Strategy 1	\$6.50 Strategy 2	\$7.00 Strategy 3	\$7.50 Strategy 4	\$8.00 Strategy 5
	----- S/bu. -----				
aero	6.38	6.54	7.03	7.59	5.13
\$.10	6.18	7.15	7.15	7.36	5.13
.20	6.18	7.01	7.01	7.36	5.13
.30	6.00	7.01	7.01	7.32	5.13
.40	5.94	7.10	7.10	7.10	5.13
.50	5.81	7.10	7.10	7.10	5.13
.60	5.63	6.90	6.90	6.90	5.13
.70	5.63	6.90	6.90	6.90	5.13

Table 5. November Soybean Futures Closing Prices on Day of Simulated Local Contracting of Soybeans, 1978 contract

Specified drop or stop loss level	Activating level				
	\$6.00 Strategy 1	\$6.50 Strategy 2	\$7.00 Strategy 3	\$7.50 Strategy 4	\$8.00 Strategy 5
	----- \$/bu. -----				
zero	6.01	6.61	6.91	6.91	6.91
\$.10	5.81	6.67	6.91	6.91	6.91
.20	5.95	6.46	6.91	6.91	6.91
.30	5.84	6.46	6.91	6.91	6.91
.40	5.75	6.38	6.91	6.91	6.91
.50	5.59	6.25	6.91	6.91	6.91
.60	6.17	6.17	6.91	6.91	6.91
.70	5.98	6.05	6.91	6.91	6.91

nearest preceding market day, close was recorded. This date was arbitrarily selected as being near to the beginning of harvest which would, presumably, require the producer to make some marketing arrangements for harvest delivery. The results for these years indicate the danger of having too high an activating price level. The 1978 results (Table 5) would have been quite satisfactory for the \$7.50 and \$8.00 activating levels, but the 1976 and 1977 results for the \$8.00 activating would have been disappointing to a producer.

### Evaluation of the Strategies

The average results of the eight plans of each strategy are shown in Table 6. The recorded price in Table 6 is the average of the appropriate cells of Tables 1-5 and represent an average Chicago November futures price for 1974-78 at which soybeans would have been contracted, that is, at a price of 15 to 50¢ below the reported prices of Table 6.

The results presented in Table 6 do not answer directly the question of whether a producer should have even indulged in contracting. Assuming selling at harvest, the producer may have been better off to ignore contracting. To see how this procedure would have worked, the mid-October Chicago futures are listed below; i.e., the October of the harvest year:

1974	\$8.67
1975	5.30
1976	6.21
1977	5.13
1978	6.91
Average	\$6.44

Table 6. Averages of November Soybean Futures Closing Prices on Day of Simulated Local Contracting of Soybeans, 1974-78 contracts

Specified drop or stop loss level	Activating level				
	\$6.00 Strategy 1	\$6.50 Strategy 2	\$7.00 Strategy 3	\$7.50 Strategy 4	\$8.00 Strategy 5
	----- \$/bu. -----				
zero	6.55	6.87	7.23	7.55	6.86
\$.10	6.48	7.06	7.69	7.75	7.07
.20	6.58	6.92	7.62	7.69	7.03
.30	6.49	6.89	7.58	7.64	6.99
.40	6.42	6.77	7.52	7.52	6.95
.50	6.36	6.75	7.45	7.45	6.91
.60	6.51	6.77	7.38	7.38	6.88
.70	6.36	6.63	7.28	7.28	6.83

The \$6.44 average is comparable to the figures in Table 6 in that it represents an average Chicago futures price at which contracting would occur. The contract price would be the same 15 to 50¢ below the figures above. It appears, at least on the average, that Strategy 1 would have been no better and no worse than ignoring November contracts and selling for cash when the crop was harvested. The \$6.44 average is not very different from the mid \$6.00 figures of Table 6 for Strategy 1. Comparing the figures, above, with those of Tables 1 and 2 allow for an example of how poorly conclusions, based on averages of several years, apply to individual years within the averages. The results of the \$6.00 activating level of Strategy 1 for 1974 resulted in signing contracts when November futures were about \$6.00 while the selling at harvest would have been done with Chicago November futures at \$8.67—about a \$2.50/bu. difference.



For the 1975 crop, the results are reversed. Contracting would have been done when futures prices were about \$8.00 while the harvest sale would have occurred when futures prices were \$5.30—a \$2.70/bu. difference. While, on the average, Strategy 1 and selling for cash at harvest would have been about equal, the results in any 1 year were dramatically better for not contracting the 1974 crop and dramatically better for contracting the 1975 crop. Strategy 2 would have yielded slightly superior average selling prices than not contracting until harvest. The figures in Table 6 for the \$6.50 activating level indicate prices from 19 to 66¢ above the \$6.44 figure. For the \$7.00 activating level (Strategy 3), the results are even better. On the average, the results of this strategy would have gotten the producer using contracts a price of from \$.84 to \$1.25/bu. more than not contracting. Strategy 4 was, on the average marginally superior to Strategy 3 while Strategy 4 (the \$8.00 activating level) was about equal, on the average, to Strategy 2 (the \$6.50 activating level).

Using a \$6.00 November futures price to activate a contracting plan would have been too conservative to be useful while using an \$8.00 Chicago price for activating would have been too high. A November futures price in the range of \$7.00 to \$7.50 would have been about right to get the best average results for the 1-year period.

One other thing is fairly clear from Table 6. The results of any one of the seven plans of each strategy using stop losses gave almost equal results. The 10 and 20 cents stop losses, in general, outperformed the 60 and 70 cents stops, but the differences are small when viewed against the volatility of soybean futures prices shown in Figures 1-6. The 10- and 20-cent stop losses gave better results than the zero drop.

The objective of this study was to develop a strategy to obtain higher than average and more nearly stable prices for soybeans for the 1974-78 period. The extreme highs for the five contracts averaged \$8.24 while the lows averaged \$4.97—the midpoint of these extremes was \$6.60. The results of using activating levels of \$7.00 and \$7.50 with 10 or 20 cents stop losses resulted in prices about \$1.00/bu. above this midpoint. As to relative stability of prices through the years, the results of the eight plans of the five strategies (Tables 1-5) have a range roughly equal to, but slightly less than, the range of the preharvest (October 15 contracting) simulation.

## Conclusions

**A**ny firm conclusions of this study necessarily refer to the recent past of the price behavior of the November contracts for soybeans. While conclusions about the past may or may not be a guide to the future, the past cannot be ignored since there is no substitute to aid in marketing decisions. That is, the producer of soybeans has a decision to make now as to the contracting of his soybeans or waiting for price increases. Prices of past periods are probably the most relevant data to aid in this decision.

Analysis of November futures prices from 1974 through 1978 lead to the following conclusions:

1) The contracting of soybeans locally was a preferred marketing strategy to not contracting provided, and only provided, that the contracting strategy was not ultra conservative.

2) The notion of waiting for the November futures to fall 10 to 20 cents before contracting was sound. This notion is one method of following the speculators' rules to "trade with the market," "never try to pick a top," "Let your profits run," and "limit your losses."

3) The price level selected to activate the contracting plan was critical to the plan. The results appear to point to a \$7.00 level for November soybean futures as the most conservative acceptable price. A \$7.50 level would seem to be about as high a price for November futures as one could reasonably expect for the 1979 contract. Some mixture of futures prices between these two extremes is probably wise. One policy might be to: do one-third of the contracting following Strategy 3 (the \$7.00 level for activating), a second one-third at \$7.25 and the final one-third at \$7.50 (Strategy 4).

4) Unless November futures were historically high in the early days of a contract (as in the 1975 contract), the contract should not have been signed until after planting. The odds appear to favor a price peak during the growing season.<sup>2</sup>

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<sup>2</sup>This study was done in April and May, 1979. Applying the conclusions to the November, 1979, soybean contract would have resulted in signing a local contract for all soybeans to be contracted for harvest delivery on June 19, 1979, when November futures closed at \$7.91.

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