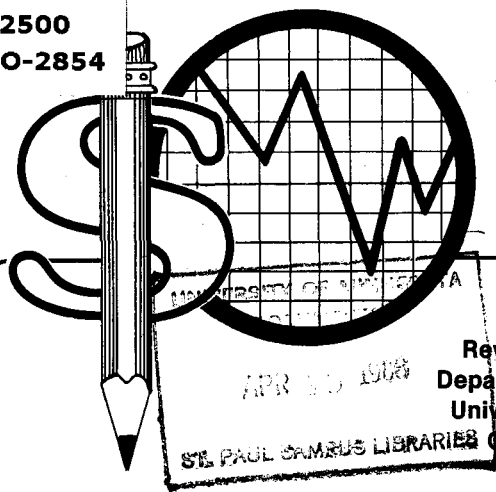


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Using Seasonal Cash Price Patterns for Selling Decisions on Corn, Soybeans and Wheat

by John (Jake) Ferris¹

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Farmers have traditionally been faced with the decision of whether to sell grain and soybeans at harvest or to store. Today, with the expansion of on-farm storage capacity, these decisions on whether and how much to store and how long to store have become much more important. To help answer these questions, some familiarity with historic price movements is recommended.

Basic to these decisions is a tabulation of prices. Ideally, farmers should have tables of *weekly* average prices at major cash markets over a period of years. These tables provide insights into how the supply pressures at harvest affect prices and the extent to which subsequent increases in price have enabled producers to profit from storage.

To illustrate how knowledge of past cash prices can be used in storage decisions, Tables 1, 2 and 3 present *monthly* average prices for 1960-1983 on No. 2 yellow corn, No. 1 yellow soybeans and

No. 2 soft red winter wheat at Chicago.² Except for displaying the short term price movements at harvest, monthly averages can provide some general guidelines for storage decisions.

At the bottom of each of the tables is a section which provides a summary of the monthly price information. The index is a measure of the average monthly prices over the season with 100 as the base. The index of 99.2 on corn for January means that Chicago cash corn prices in that month have averaged 99.2 percent of the annual average.

Standard deviation is a statistical measure of the variation of each month's average. An interpretation of the January index for corn is that we could expect that index to be 99.2 ± 3.2 , or from 96.0 to 102.4, in two-thirds of the years. Note that the standard deviation on soybean prices tends to be greater than on corn and wheat. This likely is due to the strong influence of farm price support and reserve program on corn and wheat.

The trend factor presented is an

indication of how the seasonal price pattern has changed. A negative number means that the index has been declining. A positive number means that it has been increasing. On the January index on corn, Table 1 shows the index has decreased over the 1960-83 period by about 0.1 per year. The major shift seems to have been a softening of the normal seasonal rise of soybean prices into the spring and additional downward pressure on wheat prices in this period. Some believe this may be due to the increased importance of the marketing of crops from the Southern Hemisphere in this period. The increase in on-farm storage may also have been a factor.

The indices and standard deviations for corn, soybeans and wheat are graphed in Figures 1, 2 and 3. On corn, the low is at harvest as expected with the high in early to mid-summer. Note the relatively flat pattern in the winter and early spring. The soybean pattern is about as expected with the low at harvest and high in late spring and early summer. The pattern on wheat goes counter to expectations with the decline in the late winter and early spring.

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² No. 3 yellow corn in 1960-70.

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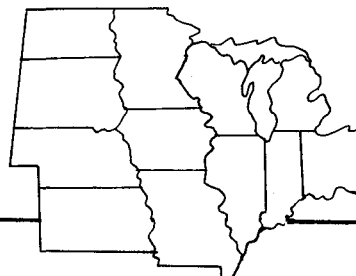


Table 1. Seasonality of Chicago Cash Prices of Corn

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1960 | 1.14 | 1.13 | 1.15 | 1.21 | 1.21 | 1.20 | 1.19 | 1.18 | 1.16 | 1.06 | .96 | 1.02 |
| 1961 | 1.10 | 1.13 | 1.11 | 1.08 | 1.13 | 1.12 | 1.14 | 1.12 | 1.10 | 1.09 | 1.10 | 1.08 |
| 1962 | 1.08 | 1.07 | 1.11 | 1.12 | 1.15 | 1.14 | 1.12 | 1.10 | 1.11 | 1.10 | 1.07 | 1.12 |
| 1963 | 1.18 | 1.19 | 1.22 | 1.20 | 1.23 | 1.29 | 1.32 | 1.32 | 1.35 | 1.18 | 1.15 | 1.19 |
| 1964 | 1.22 | 1.19 | 1.21 | 1.24 | 1.28 | 1.26 | 1.22 | 1.25 | 1.26 | 1.21 | 1.17 | 1.24 |
| 1965 | 1.26 | 1.29 | 1.31 | 1.33 | 1.36 | 1.34 | 1.33 | 1.28 | 1.28 | 1.19 | 1.14 | 1.22 |
| 1966 | 1.29 | 1.29 | 1.25 | 1.28 | 1.28 | 1.32 | 1.39 | 1.48 | 1.44 | 1.37 | 1.31 | 1.42 |
| 1967 | 1.40 | 1.38 | 1.38 | 1.36 | 1.37 | 1.35 | 1.28 | 1.22 | 1.19 | 1.15 | 1.06 | 1.11 |
| 1968 | 1.10 | 1.12 | 1.14 | 1.13 | 1.17 | 1.13 | 1.10 | 1.06 | 1.06 | 1.06 | 1.13 | 1.14 |
| 1969 | 1.18 | 1.16 | 1.15 | 1.20 | 1.30 | 1.30 | 1.27 | 1.28 | 1.19 | 1.16 | 1.15 | 1.15 |
| 1970 | 1.22 | 1.23 | 1.22 | 1.26 | 1.30 | 1.34 | 1.38 | 1.47 | 1.50 | 1.43 | 1.43 | 1.56 |
| 1971 | 1.59 | 1.58 | 1.55 | 1.52 | 1.52 | 1.57 | 1.49 | 1.30 | 1.16 | 1.11 | 1.08 | 1.22 |
| 1972 | 1.22 | 1.21 | 1.23 | 1.26 | 1.29 | 1.25 | 1.29 | 1.30 | 1.40 | 1.33 | 1.33 | 1.58 |
| 1973 | 1.58 | 1.60 | 1.59 | 1.65 | 2.02 | 2.44 | 2.52 | 2.92 | 2.48 | 2.38 | 2.50 | 2.69 |
| 1974 | 2.91 | 3.13 | 2.99 | 2.69 | 2.70 | 2.93 | 3.34 | 3.63 | 3.56 | 3.74 | 3.51 | 3.52 |
| 1975 | 3.20 | 2.97 | 2.92 | 2.99 | 2.86 | 2.91 | 2.98 | 3.17 | 3.02 | 2.74 | 2.60 | 2.60 |
| 1976 | 2.63 | 2.70 | 2.71 | 2.70 | 2.86 | 2.97 | 2.98 | 2.86 | 2.79 | 2.51 | 2.35 | 2.48 |
| 1977 | 2.56 | 2.57 | 2.54 | 2.53 | 2.43 | 2.29 | 2.07 | 1.81 | 1.84 | 1.89 | 2.19 | 2.22 |
| 1978 | 2.21 | 2.23 | 2.39 | 2.54 | 2.61 | 2.53 | 2.30 | 2.18 | 2.16 | 2.25 | 2.31 | 2.30 |
| 1979 | 2.31 | 2.39 | 2.46 | 2.56 | 2.66 | 2.83 | 3.00 | 2.82 | 2.78 | 2.73 | 2.59 | 2.69 |
| 1980 | 2.53 | 2.65 | 2.60 | 2.61 | 2.70 | 2.70 | 3.08 | 3.36 | 3.44 | 3.43 | 3.43 | 3.54 |
| 1981 | 3.56 | 3.49 | 3.48 | 3.53 | 3.47 | 3.36 | 3.28 | 3.06 | 2.72 | 2.60 | 2.61 | 2.52 |
| 1982 | 2.63 | 2.63 | 2.68 | 2.78 | 2.79 | 2.77 | 2.68 | 2.43 | 2.36 | 2.16 | 2.37 | 2.44 |
| 1983 | 2.54 | 2.74 | 2.98 | 3.12 | 3.11 | 3.28 | 3.33 | 3.60 | 3.52 | 3.47 | 3.51 | 3.38 |

INDEX OF SEASONALITY

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---------|------|------|------|-------|-------|-------|-------|-------|-------|------|------|------|
| INDEX | 99.2 | 99.4 | 99.4 | 100.0 | 102.4 | 103.3 | 103.3 | 102.6 | 100.0 | 96.1 | 94.4 | 98.1 |
| STD DEV | 3.2 | 4.2 | 4.9 | 6.1 | 5.8 | 5.8 | 4.8 | 8.2 | 6.7 | 6.1 | 5.4 | 4.3 |
| TREND | -.1 | -.1 | .0 | .1 | .0 | .0 | .1 | .0 | -.2 | .0 | .2 | .1 |

Table 2. Seasonality of Chicago Cash Prices of Soybeans

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|------|------|------|------|------|------|-------|------|------|------|------|------|------|
| 1960 | 2.18 | 2.15 | 2.16 | 2.19 | 2.19 | 2.15 | 2.16 | 2.19 | 2.15 | 2.12 | 2.11 | 2.23 |
| 1961 | 2.49 | 2.76 | 2.94 | 3.23 | 3.10 | 2.73 | 2.66 | 2.62 | 2.42 | 2.39 | 2.45 | 2.48 |
| 1962 | 2.48 | 2.47 | 2.51 | 2.56 | 2.54 | 2.53 | 2.54 | 2.55 | 2.45 | 2.45 | 2.50 | 2.53 |
| 1963 | 2.64 | 2.69 | 2.65 | 2.61 | 2.64 | 2.66 | 2.65 | 2.63 | 2.57 | 2.78 | 2.79 | 2.78 |
| 1964 | 2.78 | 2.70 | 2.69 | 2.62 | 2.56 | 2.52 | 2.52 | 2.58 | 2.70 | 2.73 | 2.81 | 2.91 |
| 1965 | 2.96 | 3.03 | 3.01 | 3.04 | 2.86 | 2.97 | 2.89 | 2.75 | 2.68 | 2.49 | 2.54 | 2.66 |
| 1966 | 2.84 | 2.91 | 2.86 | 2.98 | 3.98 | 3.38 | 3.59 | 3.73 | 3.19 | 2.96 | 2.99 | 3.00 |
| 1967 | 2.96 | 2.91 | 2.91 | 2.88 | 2.87 | 2.90 | 2.83 | 2.81 | 2.69 | 2.60 | 2.61 | 2.64 |
| 1968 | 2.69 | 2.73 | 2.71 | 2.71 | 2.74 | 2.71 | 2.71 | 2.72 | 2.61 | 2.46 | 2.53 | 2.59 |
| 1969 | 2.63 | 2.64 | 2.64 | 2.69 | 2.72 | 2.69 | 2.70 | 2.61 | 2.49 | 2.38 | 2.42 | 2.47 |
| 1970 | 2.55 | 2.59 | 2.58 | 2.64 | 2.70 | 2.81 | 2.90 | 2.79 | 2.81 | 2.95 | 3.00 | 2.93 |
| 1971 | 3.03 | 3.06 | 3.04 | 2.91 | 3.03 | 3.21 | 3.38 | 3.29 | 3.12 | 3.12 | 3.00 | 3.08 |
| 1972 | 3.09 | 3.18 | 3.37 | 3.49 | 3.49 | 3.47 | 3.51 | 3.55 | 3.55 | 3.33 | 3.64 | 4.13 |
| 1973 | 4.49 | 5.81 | 6.24 | 6.53 | 8.99 | 10.87 | 8.60 | 9.08 | 6.50 | 5.62 | 5.65 | 5.95 |
| 1974 | 6.17 | 6.34 | 6.23 | 5.56 | 5.42 | 5.47 | 6.97 | 7.55 | 7.57 | 8.33 | 7.58 | 7.28 |
| 1975 | 6.33 | 5.68 | 5.56 | 5.76 | 5.23 | 5.15 | 5.58 | 5.97 | 5.55 | 4.97 | 4.70 | 4.59 |
| 1976 | 4.65 | 4.74 | 4.66 | 4.71 | 5.21 | 6.25 | 6.64 | 6.30 | 6.59 | 6.23 | 6.58 | 6.85 |
| 1977 | 7.08 | 7.25 | 8.33 | 9.74 | 9.50 | 8.18 | 6.29 | 5.66 | 5.21 | 5.05 | 5.77 | 5.87 |
| 1978 | 5.65 | 5.57 | 6.53 | 6.81 | 7.09 | 6.79 | 6.54 | 6.43 | 6.47 | 6.76 | 6.66 | 6.79 |
| 1979 | 6.85 | 7.29 | 7.46 | 7.30 | 7.16 | 7.67 | 7.49 | 7.17 | 7.04 | 6.52 | 6.38 | 6.40 |
| 1980 | 6.22 | 6.38 | 6.06 | 5.80 | 6.02 | 6.13 | 7.19 | 7.36 | 7.87 | 8.06 | 8.71 | 7.71 |
| 1981 | 7.49 | 7.32 | 7.32 | 7.72 | 7.53 | 7.09 | 7.28 | 6.95 | 6.50 | 6.30 | 6.30 | 6.23 |
| 1982 | 6.31 | 6.21 | 6.16 | 6.48 | 6.56 | 6.27 | 6.18 | 5.42 | 5.32 | 5.26 | 5.64 | 5.65 |
| 1983 | 5.85 | 5.91 | 5.98 | 6.38 | 6.26 | 6.07 | 6.62 | 8.42 | 8.85 | 8.38 | 8.15 | 7.88 |

INDEX OF SEASONALITY

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---------|------|------|-------|-------|-------|-------|-------|-------|------|------|------|------|
| INDEX | 97.2 | 98.9 | 100.2 | 101.9 | 104.4 | 104.0 | 103.3 | 102.4 | 97.8 | 95.2 | 95.9 | 96.5 |
| STD DEV | 5.0 | 4.5 | 6.3 | 10.8 | 12.9 | 13.7 | 6.5 | 8.8 | 7.3 | 10.3 | 8.6 | 5.9 |
| TREND | -.3 | -.3 | -.2 | -.1 | -.1 | .1 | .2 | .1 | .2 | .2 | .2 | .0 |

Table 3. Seasonality of Chicago Cash Prices of Wheat

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|----------------------|-------|-------|-------|------|------|------|------|------|------|-------|-------|-------|
| 1960 | 2.03 | 2.01 | 2.06 | 2.11 | 2.07 | 1.91 | 1.85 | 1.88 | 1.93 | 1.97 | 2.02 | 2.08 |
| 1961 | 2.15 | 2.14 | 2.07 | 1.93 | 1.88 | 1.89 | 1.94 | 1.90 | 1.98 | 2.01 | 2.05 | 2.09 |
| 1962 | 2.06 | 2.04 | 2.08 | 2.13 | 2.17 | 2.17 | 2.15 | 2.11 | 2.07 | 2.05 | 2.10 | 2.13 |
| 1963 | 2.13 | 2.11 | 2.11 | 2.16 | 2.13 | 1.96 | 1.84 | 1.83 | 1.97 | 2.15 | 2.17 | 2.20 |
| 1964 | 2.24 | 2.21 | 2.03 | 2.12 | 2.03 | 1.53 | 1.43 | 1.46 | 1.49 | 1.52 | 1.55 | 1.52 |
| 1965 | 1.53 | 1.53 | 1.51 | 1.49 | 1.46 | 1.44 | 1.48 | 1.55 | 1.58 | 1.59 | 1.66 | 1.69 |
| 1966 | 1.71 | 1.71 | 1.63 | 1.64 | 1.66 | 1.79 | 1.90 | 1.90 | 1.86 | 1.72 | 1.76 | 1.80 |
| 1967 | 1.71 | 1.70 | 1.80 | 1.73 | 1.67 | 1.58 | 1.50 | 1.49 | 1.51 | 1.52 | 1.45 | 1.46 |
| 1968 | 1.49 | 1.51 | 1.50 | 1.41 | 1.38 | 1.30 | 1.28 | 1.22 | 1.20 | 1.25 | 1.32 | 1.33 |
| 1969 | 1.38 | 1.36 | 1.32 | 1.32 | 1.33 | 1.28 | 1.30 | 1.27 | 1.31 | 1.36 | 1.41 | 1.48 |
| 1970 | 1.49 | 1.55 | 1.53 | 1.55 | 1.48 | 1.41 | 1.43 | 1.52 | 1.67 | 1.74 | 1.77 | 1.74 |
| 1971 | 1.75 | 1.74 | 1.70 | 1.67 | 1.61 | 1.64 | 1.54 | 1.45 | 1.45 | 1.53 | 1.60 | 1.71 |
| 1972 | 1.69 | 1.61 | 1.62 | 1.66 | 1.63 | 1.46 | 1.53 | 1.76 | 2.02 | 2.11 | 2.28 | 2.60 |
| 1973 | 2.65 | 2.47 | 2.37 | 2.45 | 2.71 | 2.82 | 3.08 | 4.75 | 5.11 | 4.75 | 5.47 | 5.84 |
| 1974 | 6.30 | 6.50 | 5.59 | 4.33 | 3.48 | 3.91 | 4.40 | 4.34 | 4.41 | 5.03 | 4.98 | 4.60 |
| 1975 | 4.02 | 3.84 | 3.62 | 3.63 | 3.25 | 3.03 | 3.42 | 3.82 | 4.06 | 3.84 | 3.49 | 3.32 |
| 1976 | 3.45 | 3.78 | 3.66 | 3.34 | 3.30 | 3.47 | 3.37 | 3.01 | 2.89 | 2.72 | 2.60 | 2.66 |
| 1977 | 2.73 | 2.74 | 2.63 | 2.53 | 2.35 | 2.29 | 2.20 | 2.08 | 2.20 | 2.27 | 2.59 | 2.65 |
| 1978 | 2.69 | 2.64 | 2.82 | 3.11 | 3.14 | 3.19 | 3.22 | 3.32 | 3.42 | 3.51 | 3.68 | 3.68 |
| 1979 | 3.73 | 3.88 | 3.79 | 3.60 | 3.86 | 4.36 | 4.39 | 4.23 | 4.28 | 4.30 | 4.13 | 4.26 |
| 1980 | 4.36 | 4.39 | 4.18 | 3.96 | 4.04 | 3.96 | 4.17 | 4.21 | 4.38 | 4.70 | 4.92 | 4.54 |
| 1981 | 4.57 | 4.34 | 4.15 | 4.18 | 3.80 | 3.60 | 3.70 | 3.70 | 3.87 | 3.97 | 4.08 | 3.86 |
| 1982 | 3.77 | 3.57 | 3.59 | 3.70 | 3.43 | 3.31 | 3.36 | 3.35 | 3.18 | 2.98 | 3.33 | 3.23 |
| 1983 | 3.23 | 3.40 | 3.36 | 3.51 | 3.55 | 3.53 | 3.59 | 3.71 | 3.62 | 3.56 | 3.42 | 3.55 |
| INDEX OF SEASONALITY | | | | | | | | | | | | |
| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| INDEX | 104.5 | 103.7 | 100.8 | 98.9 | 96.2 | 94.0 | 94.7 | 96.4 | 99.3 | 100.9 | 103.3 | 104.1 |
| STD DEV | 6.3 | 7.2 | 5.9 | 6.9 | 8.3 | 8.4 | 7.5 | 6.9 | 6.4 | 6.1 | 6.3 | 5.8 |
| TREND | .0 | -.1 | -.2 | -.2 | -.4 | .0 | .1 | .2 | .3 | .3 | .2 | .0 |

While these tables and charts provide some guidelines for storage decisions, producers need to compare these price patterns with storage costs. By applying storage costs to the price information in the three tables, producers can quickly evaluate many alternative storage strategies based strictly on timing of sales in the cash market. If a producer knows past on-farm and commercial storage costs, net returns to storage can be calculated versus selling at harvest for as many years back as needed to verify a storage program.

As an example of how this might be done and to provide some reasonable guidelines to profitable storage, an analysis was made of storage profits in the 24 crop years beginning in 1959-60 and in the 10 crop years beginning in 1973-74. Storage profits were calculated for each month of the

storage season by deducting the harvest price and storage costs from the price for each month following harvest.

Storage costs were calculated for both on-farm and commercial.³ On-farm storage costs were only variable costs (additional costs involved with storage and not fixed costs for the facility itself). Practically the entire on-farm storage cost was foregone interest on the sales value of the commodity. Commercial storage costs included both these foregone interest charges and representative rates being charged by elevators.⁴

For example, on-farm storage costs on corn in 1982-83 were estimated to be about 3 cents per bushel per month. Prices at harvest at the farm were close to \$2 per bushel. Short term interest rates were 14-15 percent. The interest cost on the grain alone was about 30 cents per year or about 2.5 cents per month. With some additional direct costs for on-farm storage, 3 cents per month was a reasonable estimate.

October and November are the peak harvest months. Selecting

³ Assumed storage costs are given in the footnotes to Tables 4-9. These are "flat" per month costs and do not include extra drying for on-farm storage or special commercial rates dealing with "in charges," minimum storage periods, etc.

⁴ For farmers planning to erect on-farm storage, the commercial storage costs can provide some indication of prospective returns from on-farm storage when facility costs are included. Studies have shown that total costs of on-farm storage are close to commercial rates. The major advantages of on-farm storage are convenience and the broadening of marketing alternatives. For example, producers can truck grain to more distant markets.

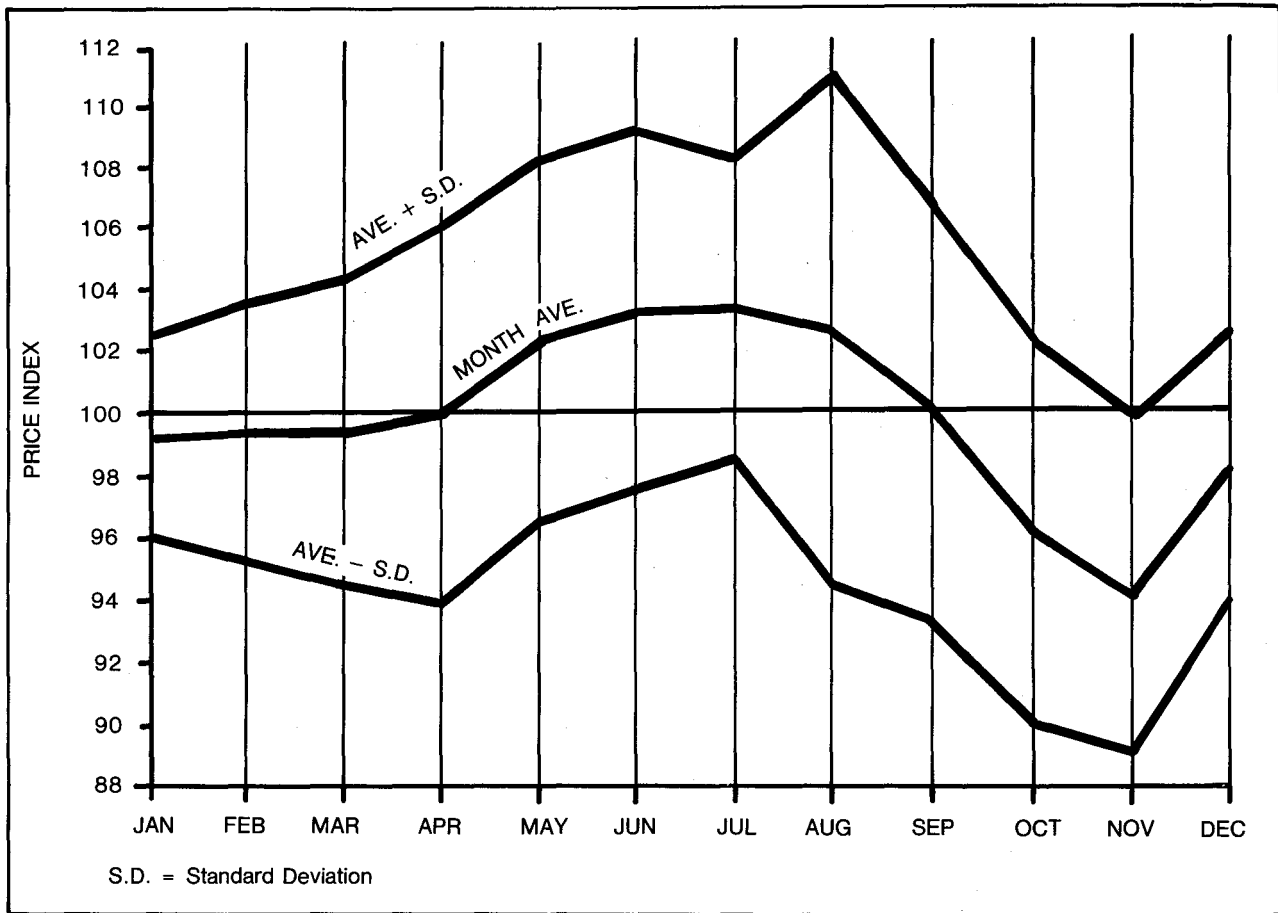


Figure 1. Corn

November in this case, the rise in No. 2 yellow corn prices between November and December was 7 cents per bushel. Deducting 3 cents left 4 cents as the net return to on-farm storage. Between November and the following January, prices increased 17 cents. Deducting 6 cents for on-farm storage left a net of 11 cents. Elevator storage rates were estimated to be about 2-3 cents per bushel per month in 1982-83. Adding on the foregone interest costs on the grain, a total commercial storage cost of 5 cents per bushel per month was calculated. Net returns over commercial storage costs then were estimated to be 2 cents in December (7 cents - 5 cents) and 7 cents in January (17 cents - 10 cents).

This same procedure was fol-

lowed for each month of the storage season from the 1959-60 crop year to 1982-83. Net returns over storage costs were calculated for each month and then converted to 1983 dollars to allow for the substantial rise in the cost of living over this time. A penny earned in the 1960s was worth considerably more than a penny earned in the 1970s and early 1980s. Consumer prices have more than tripled since 1960.

Net Returns to Storage on Corn

The results on corn for the entire period and for 1973-82 are presented in Table 4. For on-farm storage, the average net return or

margin from storage from November to December was 12 cents per bushel in 1983 dollars for the entire 1959-60 to 1982-83 period. In 1973-82, the net returns averaged 6 cents. Note that for all the months, the average margin was moderate for the entire period but very small for 1973-82. This suggests that the increase in on-farm storage has diluted the opportunities for storage profits.

If the only criterion in designing a storage strategy is to reap the highest margin, July might be selected because the average margin was 21 cents per bushel for 1959-60 to 1982-83 (same as for June) and 8 cents in 1973-82 (highest among all months). However, note in the section labeled "standard deviation" that the numbers generally increased from

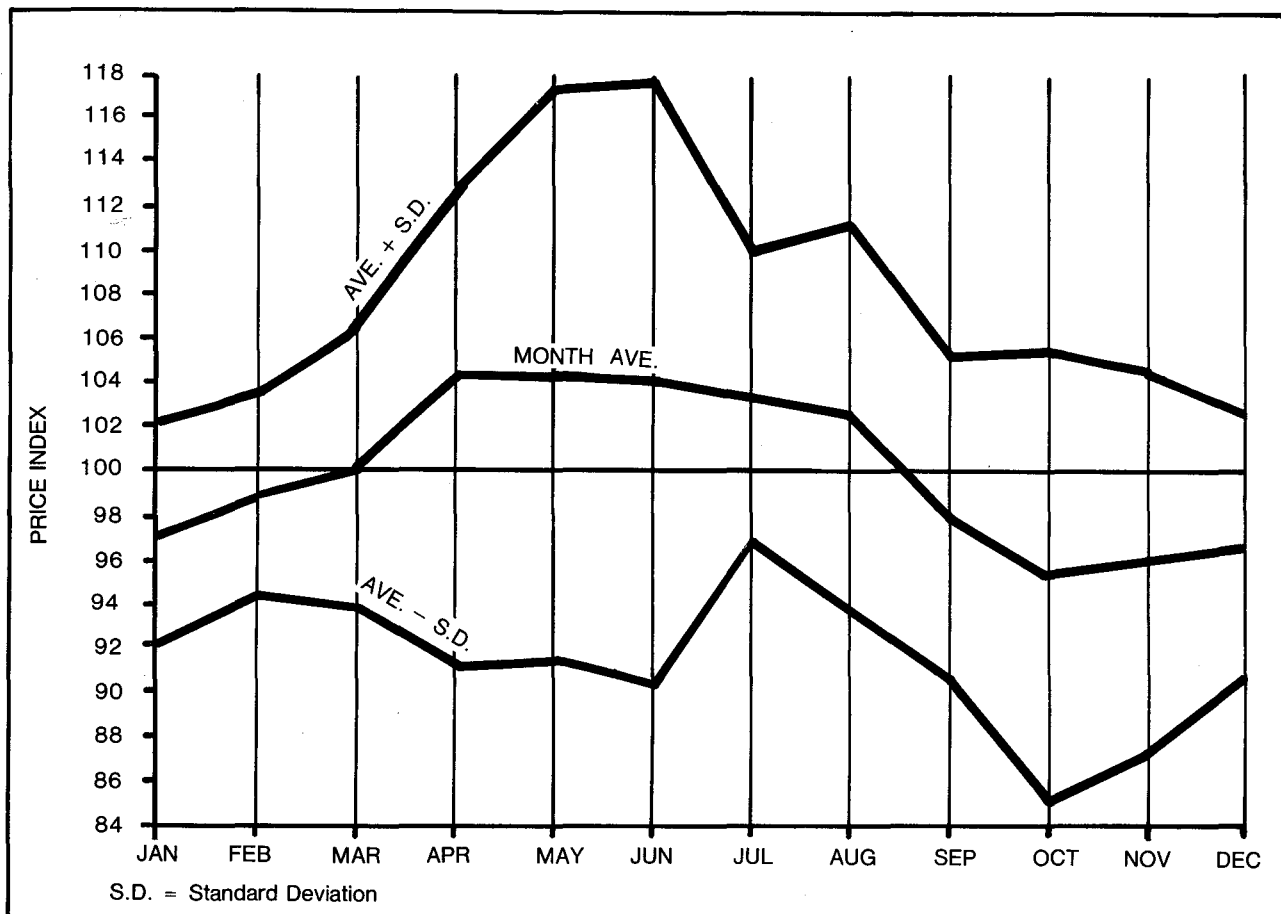


Figure 2. Soybeans

December through September.⁵ While the average margin for July is the highest, its variability is higher than in earlier months. The variability of margins increases even more in August and September. September not only had high variability but also had the lowest average margin among all the months.

Perhaps more understandable is the question, "What are the chances that I will lose if I store

corn after November?" The last line provides some information about that question. In the 24 crop years studied, a producer would have lost relative to selling at harvest in 5-7 years in storing through June and in 10-12 years after June. Profit risks increase substantially after June.

In Table 5, which deals with margins from commercial storage, the analysis suggests that the returns have been small and usually negative after February. If storing commercially, sales soon after the first of the year should be seriously considered. For most months, the probability of a profit is little better than 50 percent.

These returns are based on Chicago cash prices. Cash prices in areas remote from Chicago may

provide more opportunities for profitable storage.

Net Returns to Storage on Soybeans

Farmers trying to develop a strategy on storing soybeans on the premises will have a difficult time interpreting Table 6. Over the entire 24 year period, the highest real margins over selling in October were in the following May and June. In 1973-82, margins were strongly negative in those months. The standard deviation was also high in the spring. High as the risks have been, some attention should be given to sales in the March to June period.

⁵ In statistical terms, the standard deviation above and below the average embraces two thirds of the observations. For example, Table 4 indicates that the average return over on-farm storage in June of crop years 1959-82 was 21 cents per bushel plus or minus 62 cents. Two-thirds of the time, the net returns should be between -41 cents and +83 cents per bushel.

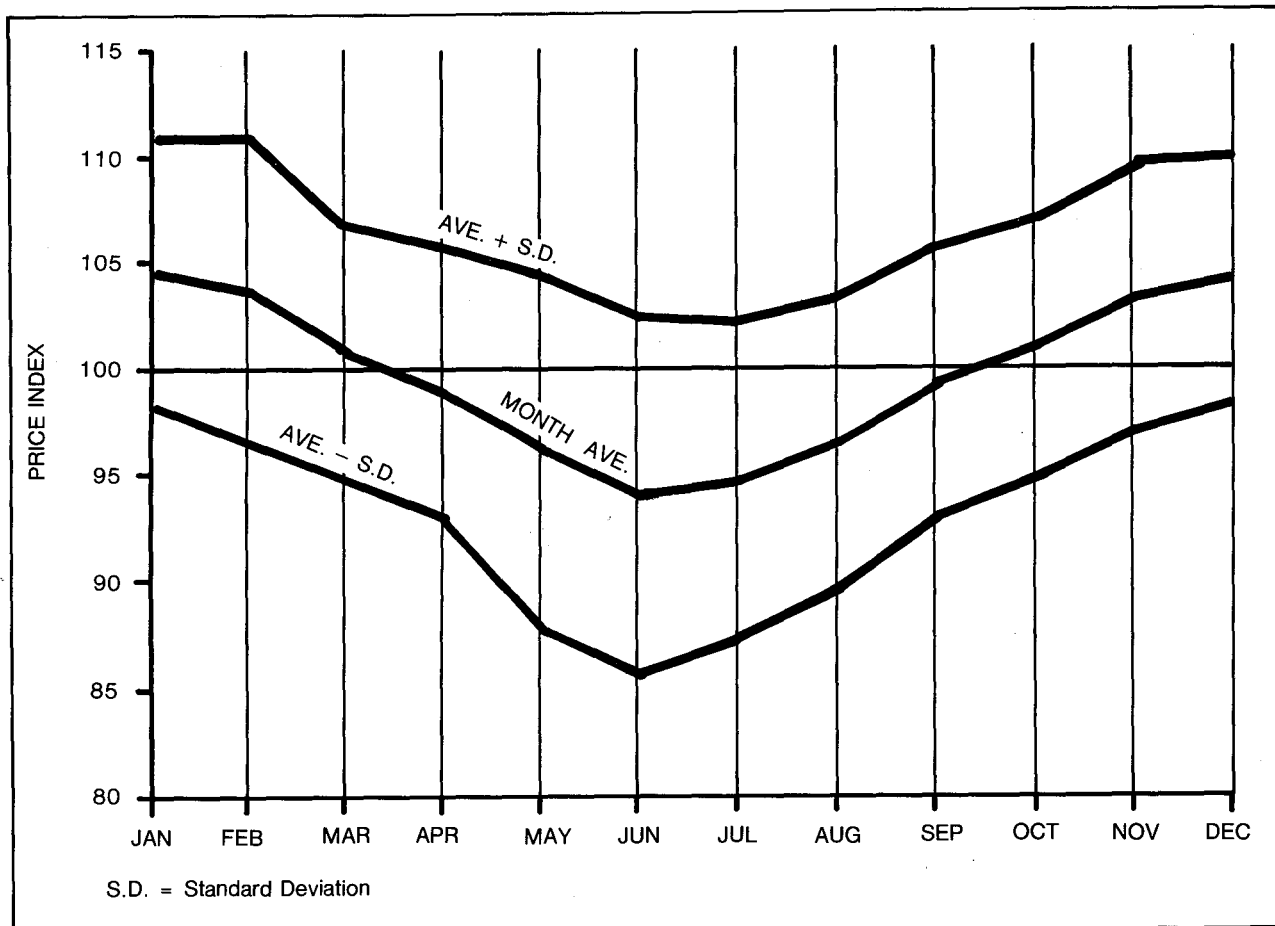


Figure 3. Wheat

Table 4. Tabulation On Farm Storage Margins On Chicago Corn, Crop Years Beginning In 1959 To Date*

| ITEM | UNIT | MONTH | | | | | | | | | | |
|---|-------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|--|
| | | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | |
| AVERAGE MARGIN | | | | | | | | | | | | |
| 1959-82 | \$/BU | .12 | .14 | .13 | .12 | .12 | .18 | .21 | .21 | .20 | .07 | |
| 1973-82 | \$/BU | .06 | .03 | .05 | .03 | .02 | .00 | .02 | .08 | .04 | -.09 | |
| STANDARD DEVIATION | | | | | | | | | | | | |
| 1959-82 | \$/BU | .17 | .28 | .39 | .38 | .34 | .47 | .62 | .72 | .95 | .87 | |
| 1973-82 | \$/BU | .14 | .36 | .57 | .55 | .49 | .58 | .63 | .79 | .98 | 1.01 | |
| NUMBER OF TIMES OUT OF 24 FOR HIGHEST MARGIN | | | | | | | | | | | | |
| NO. | | 3 | 2 | 1 | 0 | 2 | 6 | 1 | 1 | 4 | 4 | |
| NUMBER OF TIMES OUT OF 24 FOR LOWEST MARGIN | | | | | | | | | | | | |
| NO. | | 4 | 2 | 0 | 2 | 0 | 2 | 1 | 1 | 2 | 10 | |
| NUMBER OF TIMES OUT OF 24 THAT LOSSES OCCURRED | | | | | | | | | | | | |
| NO. | | 7 | 7 | 7 | 6 | 5 | 7 | 7 | 10 | 10 | 12 | |

*For farm storage, costs were estimated to be 1¢/bu./month in 1959-72, 2¢/bu./month in 1973 - 1978, 2.5¢/bu./month in 1979, 4¢/bu./month in 1980 and 1981, and 3¢/bu./month in 1982.

Table 5. Tabulation On Commercial Storage Margins On Chicago Corn, Crop Years Beginning In 1959 To Date*

| ITEM | UNIT | MONTH | | | | | | | | | |
|--|-------|-------|------|------|------|------|------|------|------|------|------|
| | | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
| AVERAGE MARGIN | | | | | | | | | | | |
| 1959-82 | \$/BU | .08 | .07 | .04 | -.01 | -.04 | -.01 | -.01 | -.04 | -.09 | -.25 |
| 1973-82 | \$/BU | .02 | -.05 | -.06 | -.12 | -.16 | -.21 | -.23 | -.21 | -.28 | -.44 |
| STANDARD DEVIATION | | | | | | | | | | | |
| 1959-82 | \$/BU | .17 | .28 | .40 | .39 | .36 | .50 | .64 | .74 | .97 | .89 |
| 1973-82 | \$/BU | .14 | .36 | .57 | .56 | .51 | .60 | .65 | .81 | .99 | 1.03 |
| NUMBER OF TIMES OUT OF 24 FOR HIGHEST MARGIN | | | | | | | | | | | |
| | NO. | 6 | 4 | 1 | 0 | 1 | 3 | 1 | 2 | 4 | 2 |
| NUMBER OF TIMES OUT OF 24 FOR LOWEST MARGIN | | | | | | | | | | | |
| | NO. | 2 | 1 | 0 | 1 | 1 | 3 | 2 | 1 | 0 | 13 |
| NUMBER OF TIMES OUT OF 24 THAT LOSSES OCCURRED | | | | | | | | | | | |
| | NO. | 9 | 8 | 12 | 12 | 13 | 11 | 10 | 14 | 15 | 15 |

*For commercial storage, costs were estimated to be 2¢/bu./month in 1959-72, 4¢/bu./month in 1973 - 1978, 6.5¢/bu./month in 1979, 8¢/bu./month in 1980 and 1981, and 5¢/bu./month in 1982.

Table 6. Tabulation On Net Farm Storage Margins On Chicago Soybeans, Crop Years Beginning In 1959 To Date*

| ITEM | UNIT | MONTH | | | | | | | | | |
|--|-------|-------|------|------|------|------|------|------|------|------|------|
| | | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG |
| AVERAGE MARGIN | | | | | | | | | | | |
| 1959-82 | \$/BU | .05 | .08 | .11 | .24 | .35 | .49 | .74 | .71 | .58 | .56 |
| 1973-82 | \$/BU | -.02 | -.15 | -.37 | -.45 | -.27 | -.11 | -.24 | -.42 | -.22 | -.26 |
| STANDARD DEVIATION | | | | | | | | | | | |
| 1959-82 | \$/BU | .49 | .74 | 1.17 | 1.77 | 2.08 | 2.36 | 3.31 | 3.86 | 2.87 | 3.08 |
| 1973-82 | \$/BU | .73 | .96 | 1.51 | 1.93 | 2.37 | 2.74 | 2.90 | 2.63 | 2.34 | 2.49 |
| NUMBER OF TIMES OUT OF 24 FOR HIGHEST MARGIN | | | | | | | | | | | |
| | NO. | 6 | 0 | 0 | 3 | 0 | 4 | 3 | 2 | 3 | 3 |
| NUMBER OF TIMES OUT OF 24 FOR LOWEST MARGIN | | | | | | | | | | | |
| | NO. | 6 | 1 | 0 | 1 | 1 | 2 | 1 | 1 | 2 | 9 |
| NUMBER OF TIMES OUT OF 24 THAT LOSSES OCCURRED | | | | | | | | | | | |
| | NO. | 10 | 10 | 10 | 8 | 8 | 10 | 10 | 9 | 8 | 10 |

*For farm storage, costs were estimated to be 1.5¢/bu./month in 1959-72, 5.0¢/bu./month in 1973 - 1978, 6.5¢/bu./month in 1979, 8.5¢/bu./month in 1980, 8.0¢/bu./month in 1981 and 6¢/bu./month in 1982.

Based on the entire period, the chances for a profit are about two-thirds from on-farm storage but less than 50 percent from commercial storage (Table 7).

Net Returns to Storage on Wheat

Net returns to storage on wheat are presented in Table 8. Note that in both the entire period and in 1973-82, storage has not paid on

the average beyond January or even beyond November. Based on probabilities for storage profits, risks increase noticeably after January.

Producers storing commercially

Table 7. Tabulation On Commercial Storage Margins On Chicago Soybeans, Crop Years Beginning in 1959 To Date*

| ITEM | UNIT | MONTH | | | | | | | | | | |
|--|-------|-------|------|------|------|------|------|------|------|------|------|--|
| | | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | |
| AVERAGE MARGIN | | | | | | | | | | | | |
| 1959-82 | \$/BU | .00 | -.02 | -.04 | .05 | .11 | .20 | .41 | .34 | .16 | .09 | |
| 1973-82 | \$/BU | -.07 | -.26 | -.53 | -.66 | -.54 | -.42 | -.61 | -.83 | -.69 | -.77 | |
| STANDARD DEVIATION | | | | | | | | | | | | |
| 1959-82 | \$/BU | .49 | .74 | 1.17 | 1.78 | 2.09 | 2.38 | 3.33 | 3.89 | 2.90 | 3.10 | |
| 1973-82 | \$/BU | .73 | .97 | 1.51 | 1.93 | 2.38 | 2.76 | 2.92 | 2.66 | 2.34 | 2.47 | |
| NUMBER OF TIMES OUT OF 24 FOR HIGHEST MARGIN | | | | | | | | | | | | |
| | NO. | 8 | 1 | 1 | 3 | 1 | 3 | 2 | 1 | 3 | 2 | |
| NUMBER OF TIMES OUT OF 24 FOR LOWEST MARGIN | | | | | | | | | | | | |
| | NO. | 5 | 0 | 0 | 1 | 0 | 3 | 0 | 3 | 2 | 11 | |
| NUMBER OF TIMES OUT OF 24 THAT LOSSES OCCURRED | | | | | | | | | | | | |
| | NO. | 10 | 12 | 11 | 11 | 11 | 13 | 15 | 13 | 13 | 14 | |

*For commercial storage, costs were estimated to be 3¢/bu./month in 1959-72, 7.5¢/bu./month in 1973 - 1978, 11.5¢/bu./month in 1979, 14¢/bu./month in 1980 and 1981, and 10¢/bu./month in 1982.

Table 8. Tabulation On Net Farm Storage Margins On Chicago Wheat, Crop Years Beginning In 1959 To Date*

| ITEM | UNIT | MONTH | | | | | | | | | | |
|--|-------|-------|------|------|------|------|------|------|------|------|------|------|
| | | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN |
| AVERAGE MARGIN | | | | | | | | | | | | |
| 1959-82 | \$/BU | .12 | .24 | .26 | .38 | .38 | .38 | .32 | .10 | -.07 | -.26 | -.40 |
| 1973-82 | \$/BU | .30 | .43 | .40 | .53 | .41 | .41 | .40 | .04 | -.32 | -.67 | -.62 |
| STANDARD DEVIATION | | | | | | | | | | | | |
| 1959-82 | \$/BU | .80 | .99 | .89 | 1.16 | 1.32 | 1.52 | 1.57 | 1.23 | .92 | .99 | 1.19 |
| 1973-82 | \$/BU | 1.23 | 1.49 | 1.27 | 1.72 | 1.94 | 2.24 | 2.37 | 1.86 | 1.22 | 1.14 | 1.44 |
| NUMBER OF TIMES OUT OF 24 FOR HIGHEST MARGIN | | | | | | | | | | | | |
| | NO. | 4 | 3 | 1 | 4 | 1 | 3 | 2 | 0 | 1 | 1 | 4 |
| NUMBER OF TIMES OUT OF 24 FOR LOWEST MARGIN | | | | | | | | | | | | |
| | NO. | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 14 |
| NUMBER OF TIMES OUT OF 24 THAT LOSSES OCCURRED | | | | | | | | | | | | |
| | NO. | 14 | 11 | 9 | 8 | 9 | 9 | 11 | 12 | 13 | 14 | 17 |

*For farm storage, costs were estimated to be 1.25¢/bu./month in 1959-72, 3.0¢/bu./month in 1973 - 1978, 3.5¢/bu./month in 1979, 5.0¢/bu./month in 1980 and 1981, and 4¢/bu./month in 1982.

should appraise prospects for further storage in November (Table 9). After November, margins have historically declined and risks of losses have increased substantially. Based on the results for the period from 1959-60 to 1982-83, the probability of a profit over harvest sales after November has been less than 50 percent.

Storing From One Crop Year to the Next

An analysis was made on storage returns from holding corn, soybeans and wheat from one crop year to the next. The results indicate that such a program should not be considered unless grain is in the Farmer-Owned

Reserve. Using on-farm storage costs, storing corn and soybeans into the next crop year would have paid only three times in the 10 crop years from 1973-74 to 1982-83. Storing wheat would have paid only twice. Using commercial storage rates, the results were similar except that storing wheat would have paid only once.

Table 9. Tabulation On Commercial Storage Margins On Chicago Wheat, Crop Years Beginning In 1959 To Date*

| ITEM | UNIT | MONTH | | | | | | | | | | | |
|---|-------|-------|------|------|------|------|------|------|------|------|-------|-------|--|
| | | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | |
| AVERAGE MARGIN | | | | | | | | | | | | | |
| 1959-82 | \$/BU | .08 | .16 | .15 | .22 | .18 | .15 | .05 | -.21 | -.41 | -.64 | -.81 | |
| 1973-82 | \$/BU | .26 | .35 | .28 | .37 | .21 | .17 | .12 | -.29 | -.69 | -1.07 | -1.06 | |
| STANDARD DEVIATION | | | | | | | | | | | | | |
| 1959-82 | \$/BU | .80 | .99 | .89 | 1.16 | 1.32 | 1.52 | 1.57 | 1.24 | .94 | 1.02 | 1.22 | |
| 1973-82 | \$/BU | 1.23 | 1.49 | 1.27 | 1.71 | 1.94 | 2.24 | 2.36 | 1.85 | 1.22 | 1.17 | 1.46 | |
| NUMBER OF TIMES OUT OF 24 FOR HIGHEST MARGIN | | | | | | | | | | | | | |
| NO. | | 6 | 1 | 1 | 5 | 3 | 3 | 2 | 0 | 1 | 0 | 2 | |
| NUMBER OF TIMES OUT OF 24 FOR LOWEST MARGIN | | | | | | | | | | | | | |
| NO. | | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 4 | 15 | |
| NUMBER OF TIMES OUT OF 24 THAT LOSSES OCCURRED | | | | | | | | | | | | | |
| NO. | | 16 | 14 | 12 | 9 | 13 | 14 | 15 | 17 | 18 | 21 | 19 | |

*For commercial storage, costs were estimated to be 2.5¢/bu./month in 1959-72, 5.5¢/bu./month in 1973 - 1978, 7.0¢/bu./month in 1979, 9.0¢/bu./month in 1980 and 1981, and 6¢/bu./month in 1982.

Storage Strategies

Many different strategies could be evaluated based on the historic information presented. The one selected by a producer would depend on willingness and ability to handle risk. Using both the net margin and risk criteria in selecting a strategy, a reasonable scheme might be as follows:

1. **Corn.** Sell at regular intervals between January and June.
2. **Soybeans.** Sell at regular intervals between March and June.
3. **Wheat.** Sell at regular intervals between October and January.

The results of these programs are presented in Table 10. Returns to on-farm storage on corn averaged a modest 15 cents per bushel with profits realized in about 4 years out of 5. Net returns averaged 57 cents on soybeans and 35 cents on wheat with profits in about 3 years out of 5. The profit figures are in 1983 dollars.

Average returns to commercial

Table 10. Net Returns to Storage and Frequency of Profits for Corn, Soybeans and Wheat, Crop Years 1959-60 to 1982-83, 1983 Dollars¹

| | Unit | Corn | Soybeans | Wheat |
|---|------|------|----------|-------|
| On Farm | | | | |
| Net returns over storage costs | ¢/bu | 15 | 57 | 35 |
| Percent of years storage was profitable | % | 79 | 61 | 62 |
| Commercial | | | | |
| Net returns over storage costs | ¢/bu | 1 | 26 | 18 |
| Percent of years storage was profitable | % | 50 | 50 | 46 |

¹Comparison is between selling corn in January to June, soybeans in March to June and wheat in October to January relative to harvest prices.

storage were nil on corn and moderate on soybeans and wheat. Profits to commercial storage were realized in about half of the years.

Year to year variation in returns to storage was substantial. In some years, storage was extremely profitable and in other years extremely unprofitable. For example, on-farm storage of corn with regular sales in January to June netted an average of 63 cents per bushel in the 1973-74 crop year over selling in November. In 1974-75, the same program lost \$1.18 per

bushel. The challenge is to determine in which years to store (and how much) and in which years to sell at harvest. Are there any useful guidelines?

The Short Crop Rule

Part of the lore in the grain trade is that "a short crop has a long tail." This means that prices in a short crop year tend to be high at harvest and then "tail off" later in the season. The explanation is that the trade, knowing that available supplies are limited, bids up prices

early in the season to fill requirements and then has diminished needs later in the season. How well does the short crop rule work?

In any analysis of this rule in the crop years from 1959-60 through 1982-83, the rule has merit on corn and soybeans but not on wheat (Table 11). The years were classified as small, medium and large based on departures from production trends. Looking at both on-farm and commercial storage, the percent of profitable storage years was less for the short crop years than the medium or large crop years on both corn and soybeans but not on wheat. Note that only 3 short crop years could be clearly identified on soybeans and only 4 on wheat.

Use of Fundamental and Technical Analysis

Each crop year is unique. Past patterns of prices provide a standard but are not sufficient for effective decisions on storage. The short crop rule is one attempt to apply market fundamentals to the storage decision. However, more information is needed on such factors as the size of the carryover; how much the carryover is owned by the Commodity Credit Corporation and what is its minimum selling price; and how much of the carryover is in the Farmer Owned Reserve and what is its release price.

If prices at harvest are well below the regular government loan rate, chances are good that prices will reach the loan rate later in the season unless participation in the farm program is particularly low. Downside price risks in this situation are minimal and farmers are advised to store.

Analysis of market fundamentals on the supply and demand outlook each year is readily available from universities, the U.S. Department

Table 11. Effect of Crop Size on the Profitability of Storage, 1959-82

| Size of Crop | Number of Years | Percent of Years Storage was Profitable ¹ | |
|--------------|-----------------|--|--------------|
| | | On-Farm % | Commercial % |
| Corn | | | |
| Small | 7 | 57 | 43 |
| Medium | 6 | 100 | 83 |
| Large | 11 | 91 | 36 |
| Soybeans | | | |
| Small | 3 | 33 | 33 |
| Medium | 12 | 64 ² | 55 |
| Large | 9 | 67 | 44 |
| Wheat | | | |
| Small | 4 | 75 | 50 |
| Medium | 9 | 78 | 56 |
| Large | 11 | 45 | 36 |

¹Net returns to storage were calculated from a selling program on corn from January to June, on soybeans from March to June and on wheat from October to January.

²In one year storage returns were nil so this year was not included in the calculation of the percentage.

of Agriculture and private firms. In making storage decisions, producers should refer to these sources. Such information can be integrated into the process of evaluating past price patterns in terms of the year at hand.

Another element in storage decisions is to establish precise timing on sales decisions. All the ingredients for selling may be present but the question remains as to whether the sale should be made today, tomorrow or next week. Market fundamentals will not provide much help in this regard. Knowledge of the technical position of the market may be useful. Technical analysis is an attempt to uncover any underlying short term price patterns that have predictive power.

This approach is a refinement in the storage decision process that might best be placed into the hands of a professional. Many market advisory firms use this approach. Some farmers have used technical analysis to sharpen their marketing skills. However, most farmers wanting to make use of technical analysis might best select a broker or market advisory

firm to develop a marketing strategy. To evaluate alternative services, place a modest amount of grain in their hands to market and check their track record over time.

“Basis” as a Guideline

A key to storage decisions is the relationship between futures and cash prices as a guideline for storage decisions. This relationship is commonly referred to as “basis.” When the basis is wide (cash prices are weak relative to futures), the market is sending signals not to sell and is providing opportunities for storage profits. When the basis is narrow (cash prices are strong relative to futures), the market is sending the signal that it wants grain and will not pay to store cash grain. Farmers can capitalize on a wide basis by either hedging or using commodity options.

“Basis” and its use are explained in the fact sheet, “Understanding and Using Basis for Grain.”

Emerging Rules of Thumb

From an analysis of price patterns in the past, a number of rules of thumb in storing corn, soybeans and wheat have emerged.

1. Avoid sales at peak of harvest.
2. If on-farm storage is limited, sell early and late harvested grain rather than placing it in commercial storage.
3. Watch the "basis" carefully and step up sales when the price level is attractive and basis is narrow (strong).
4. Hedge or use commodity options if the price level is attractive and basis is suffi-

ciently wide (weak).

5. Store unhedged grain if prices are well below the government loan rate. Downside price risks are minimal.
6. Be wary of storing in short crop years on corn and soybeans and be prepared to sell regularly early in the season.
7. When storing unhedged corn, evaluate storage prospects in January and plan to wrap up sales by June. For soybeans, watch selling opportunities especially in March to June. For wheat, gear normal selling practices to the October to January period. Avoid storing corn and soybeans into late summer and wheat into late winter and spring, the periods when price risks increase.
8. Do not plan to store from one crop year to the next unless the grain is in the farmer-owned reserves.
9. Erect on-farm storage for convenience and broadening marketing alternatives, not for reaping substantial storage profits.
10. At all times, follow market fundamentals and technical signs. Work with professional services, especially for short term marketing decisions.

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