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CIRCULAR 948

# When to Sell *Corn · Soybeans · Oats · Wheat*

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CHOOSING THE TIME to market grain is a difficult and important task. Here is the key question in deciding when to sell corn, soybeans, wheat, and oats: *Will the price rise enough from harvest to the time of selling to more than cover the costs of holding grain?* This circular attempts to help farmers answer that question by describing the 1952-65 patterns of grain prices and costs of storing the grains.

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*This circular was prepared by T. A. HIERONYMUS, Professor of Agricultural Economics. It replaces Circular 833.*

## WHEN TO SELL

# Corn

ABOUT 62 PERCENT OF THE CORN produced in Illinois is sold off of the farms where it is grown. In 1963 corn sales amounted to about 470 million bushels a year, and accounted for about 23 percent of gross farm income in the state. In some counties as much as 90 percent of the production is sold, accounting for 50 percent of gross farm income. This is why selling at the highest possible price is so important.

### Cost of Storing Corn

The first problem in deciding whether to hold or sell corn is to determine how much the storage costs will be. The alternative storage methods available to farmers are (1) storing on the ear in slatted cribs, (2) artificially drying and storing in steel bins, and (3) hiring an elevator to do the drying and storing.

The cost of storage includes both fixed and variable costs. If storage space is available and no other use will be made of it, no charge should be made for the fixed costs. If space is not available, both fixed and variable costs must be considered in deciding whether or not to build storage facilities. Once they have been erected, the decision about using them in a particular year is not affected by the fixed costs.

Fixed costs of storing on the farm include interest, depreciation, repair and maintenance, property tax, and insurance on investment.

Variable costs are the additional costs incurred while the corn is in storage. They include interest on the money tied up in corn, property tax, insurance on the corn, shrinkage and deterioration (including rodent and insect damage), and cost of moving the grain into and out of storage. If artificial drying is used, the cost of operating the drier should also be included.

If the corn is dried and stored in an elevator, there are no fixed costs involved. The variable costs include the charge made for drying and storing, interest, and property tax.

The costs of storing ear corn and shelled corn are not directly comparable because each storage method is associated with its own method of harvesting. To decide which alternative is best, the total cost of harvesting must be added to the cost of storing in each case.

**Fixed storage costs.** It costs about 85 cents per bushel of capacity to build a good crib of conventional construction (combination ear corn and small grain space with the cost per bushel for small grain and corn equal). A rule of thumb is that the annual cost is about 10 percent of the original cost, or 8.5 cents a bushel. This includes depreciation on a 20-year schedule, maintenance, insurance, taxes, and interest on investment. Cheaper cribs can be built, but the depreciation rate and maintenance are higher, so the annual costs are about the same.

The cost of buying a batch-in-bin drying system and metal storage bins for a 10,000-bushel volume is about 58 cents a bushel. The annual fixed cost of this system is approximately 6 cents a bushel.

**Insurance.** Insurance is included in the cost of storage because the risk of loss exists whether it is carried by the owner or passed on to an insurance company. Insurance costs vary according to the type of company writing the policy, the risks insured against, and the kind of storage space used.

A yearly rate quoted in 1966 by one company insuring grain stored by Illinois farmers was 70 cents per \$100 valuation. The daily rate for shorter periods is somewhat higher. With corn valued at \$1.10 a bushel, the insurance costs per bushel for various periods would be:

1 month.....	.146 cent	6 months.....	.462 cent
3 months.....	.270 cent	9 months.....	.616 cent

**Taxes.** If corn is sold before the assessment date (April 1 in Illinois), personal property taxes are not a cost. If it is sold afterwards, they are. In a fairly typical east-central Illinois situation the rate was 1.5 cents a bushel in 1966.

**Interest.** When corn is sold early, interest may be earned on the proceeds, or debts may be paid and the interest on them saved. If corn is \$1.10 a bushel, the interest at different rates is as follows:

Rate (percent)	1 month	3 months	6 months	9 months
	(cents per bushel)			
4.....	.367	1.100	2.200	3.300
5.....	.458	1.375	2.750	4.125
6.....	.550	1.650	3.300	4.950
7.....	.642	1.925	3.850	5.775

**Shrinkage.** Corn loses weight when it is stored. Some of the reduction is due to loss of moisture and should not be considered a part of shrinkage.

Shrinkage is the result of handling, deterioration and rodent infestation. It varies with the handling equipment, care, and rodent control. Handling loss occurs when corn is put in and taken out of storage, and does not vary through time. Rodent damage generally can be

controlled. Corn is rarely subject to deterioration if it is properly harvested and cribbed. Shrinkage also occurs when the corn is artificially dried, resulting from the loss of dry matter during the drying process. Accordingly, we assume a shrinkage of 0.5 percent regardless of length of storage, and a handling charge of 1 cent a bushel for moving the corn into and out of storage.

**Moisture change.** As ear corn loses moisture in storage, the weight loss increases the value per bushel until the moisture is down to a point at which moisture discounts no longer apply. The loss in weight must be compared with the reduction in moisture discount.

Moisture discounts are generally 1 cent a bushel (1966) for each 0.5 percent, or fraction thereof, above 15.5 percent moisture. In the fall of 1965 there was a range of moisture discounts, generally from 1 cent for each 0.5 percent moisture to 1½ cents for each 0.5 percent and extending to 2 cents at higher moisture levels. Our examples are based on the 1-cent scale but any variation in local discounts should be taken into account. The loss in weight during storage is offset by an increase in the price paid until the moisture goes below 15.5 percent. There are no premiums for corn below 15.5 percent moisture, so all of the loss in weight as corn dries below 15.5 percent must be counted as a cost of storage.

The quantities of corn remaining after 1,000 bushels of corn dry from various moisture levels to lower ones are shown in Table 1. No allowance is made for any weight loss except that caused by loss of water. Suppose a farmer has 1,000 bushels of corn with 19-percent moisture. If he carries it until it is down to 15 percent, the table shows that he will have 953 bushels left. At 13 percent, he will have 931 bushels. Note that the weight decrease is not simply the difference between original moisture and final moisture, but is based on the difference in dry matter at the two times (footnote, Table 1).

Moisture discounts include both moisture loss and penalty. The penalty exists because it costs money to dry corn. To find the amount that is penalty for selling high-moisture corn, we multiply the price for No. 2 yellow corn by the bushels remaining after the corn has dried down to 15.5 percent (the maximum moisture for grade No. 2) and compare this amount with what the original quantity would bring at the discounted price.

For an example of this computation, let's assume that a farmer has 1,000 bushels of 20.5 moisture corn. At a discount scale of 1 cent for each 0.5 percent above 15.5-percent moisture, the discount is 10 cents a bushel. With the price of No. 2 yellow corn at \$1.10, the high-moisture corn would sell for \$1.00 a bushel or a total of \$1,000.

Table 1. — Weight Loss in Shelled Corn Dried Naturally to Specified Moisture Contents, Assuming 1,000 Bushels When Cribbed

Moisture in corn when cribbed (percent)	Amount of corn remaining when moisture is reduced to the following percentages: <sup>a</sup>								
	19	18	17	16	15.5	15	14	13	12
	(bushels)								
28.....	889	878	867	857	852	847	837	828	818
26.....	914	902	892	881	876	871	860	851	841
24.....	938	927	916	905	899	894	884	874	864
23.....	951	939	928	917	911	906	895	885	875
22.....	963	951	940	929	923	918	907	897	886
21.....	975	963	952	940	935	929	919	908	898
20.....	988	976	964	952	946	941	930	920	909
19.....	1,000	988	976	964	959	953	942	931	920
17.5.....	...	...	994	982	976	971	959	948	938

<sup>a</sup> The quantities listed were obtained by dividing the percentage of dry matter in the corn at the beginning of storage (100 minus original percentage of moisture) by the percentage of dry matter remaining at the end of the storage period (100 minus final percentage of moisture) and multiplying by 1,000.

On the other hand, if the corn is allowed to dry down to 15.5 percent, there will be 941 bushels remaining which will bring the full \$1.10 a bushel or \$1,035.10.

Thus the farmer would receive \$1.00 a bushel for 20.5 moisture corn compared with \$1.035 a bushel, on the basis of the original amount of 1,000 bushels, after the corn dried to 15.5 percent. This is a difference of 3.5 cents a bushel. The 10 cents discount is composed of 6.5 cents for moisture loss and 3.5 cents penalty.

In figuring the cost of storage, the amount that corn increases in price as it dries must be subtracted from the cost of storage. The computation must be made for each individual farm in each year. However, to arrive at some generalized value, the following typical moisture contents of Illinois farm-stored corn are listed:<sup>1</sup>

October....	20.5	February....	18.5	June.....	13.9
November...	19.2	March.....	17.9	July.....	13.4
December...	18.6	April.....	16.5	August.....	13.2
January....	18.6	May.....	14.9	September...	12.8

The amounts that should be credited to storage per bushel as the result of improvement in quality are: for 1 month, .4 cent; 3 months, .6 cent; 6 months, 2.8 cents; and 9 months, 1.0 cent.

If the corn is dried artificially, the same principle (as in ear corn) applies to moisture changes. However, the corn must be dried down to 13 or 13.5 percent to keep it from going out of condition. The farmer

<sup>1</sup> For a more complete treatment see Illinois Agricultural Experiment Station Bulletin 653, "Effects of Moisture Losses on Costs of Storing Ear Corn," Table 1.

who artificially dries corn has the problem of regulating the drier to get the desired moisture content. Elevator operators report that much of the artificially dried corn they receive from farmers has been dried to as low as 9 or 10 percent moisture. The value of the corn decreases in direct proportion to the decrease in moisture below 15.5 percent. Also, the drying costs increase. If the market price of corn is \$1.10 a bushel, at 13 percent moisture the cost of moisture loss is 3.16 cents a bushel. At 10 percent moisture the cost is 6.7 cents a bushel.

**Summary of conditioning and storage costs.** The following tabulations show storing and conditioning costs for three methods. In each case the assumed alternative is selling corn directly from the field.

The costs of storing *ear corn on farms* for four different periods, assuming beginning moisture of 20.5 percent, are:

	1 month	3 months	6 months	9 months
	(cents per bushel)			
Annual fixed crib cost.....	8.50	8.50	8.50	8.50
Interest at 6 percent.....	.55	1.65	3.30	4.95
Insurance.....	.15	.27	.46	.62
Taxes.....	.00	.00	1.50	1.50
Extra handling and dry matter loss.....	1.55	1.55	1.55	1.55
Natural drying (deduct) <sup>1</sup> .....	-.36	-.60	-2.83	-.98
Total without crib cost.....	1.89	2.87	3.98	7.64
Total including crib cost.....	10.39	11.37	12.48	16.14

<sup>1</sup> See explanatory footnote under the following tabulation for shelled corn.

The costs of storing and drying *shelled corn on farms*, assuming corn harvested at 22 percent and sold at 13 percent moisture, are:

	1 month	3 months	6 months	9 months
	(cents per bushel)			
Drying, fixed costs.....	2.80	2.80	2.80	2.80
Storage, fixed costs.....	3.20	3.20	3.20	3.20
Drying, operating costs.....	2.80	2.80	2.80	2.80
Interest at 6 percent.....	.55	1.65	3.30	4.95
Insurance.....	.15	.27	.46	.62
Extra handling and dry matter loss.....	1.55	1.55	1.55	1.55
Taxes.....	.00	.00	1.50	1.50
Market discount minus weight loss (deduct) <sup>1</sup> .....	-1.62	-1.62	-1.62	-1.62
Total without fixed costs.....	3.43	4.65	7.99	9.80
Total including fixed costs.....	9.43	10.65	13.99	15.80

<sup>1</sup> The remaining quantity at \$1.10 is worth \$.9862 per bushel of the original quantity, while the original quantity would have been discounted 13 cents and thus be worth \$.97 per bushel of original weight. Therefore 1.62 cents should be credited to the drying process.

The costs of *renting elevator service* (cost of storing and drying, assuming harvest at 22 percent moisture) are:

	1 month	3 months	6 months	9 months
	( <i>cents per bushel</i> )			
Drying.....	4.90	4.90	4.90	4.90
Storage.....	5.00	5.00	9.00	10.00
Interest at 6 percent.....	.55	1.65	3.30	4.95
Taxes.....	.00	.00	1.50	1.50
Market discount minus weight loss (deduct) <sup>1</sup> .....	-3.98	-3.98	-3.98	-3.98
Total.....	6.47	7.57	14.72	17.37

<sup>1</sup> Takes invisible shrink of .5 percent into account. (See also explanatory footnote under the preceding tabulation of costs of storing and drying shelled corn on farms.)

Although the charges made for drying and storage of corn at country elevators are highly variable at the present time (1966), this tabulation for elevator service should be fairly representative. It is based on warehouse receipts at 15.5 percent moisture, a drying charge of  $\frac{3}{4}$  cent for each percentage point down to 15.5, and storage of  $1\frac{1}{2}$  cents per bushel per month with a 5-cent minimum and a 10-cent maximum.

### Sales of Corn Are Spread Over the Year

Sales of corn are spread fairly evenly over the marketing year. Here are the average percentages of corn sold in each month by Illinois farmers in the 1955-65 period:

October... 11	January... 10	April..... 8	July..... 6
November.. 17	February... 8	May..... 7	August..... 6
December.. 9	March..... 8	June..... 6	September... 4

The largest sales occur in November, at the end of harvest. The harvest run of corn ends in January, and from February through September sales are 4 to 8 percent per month. The average monthly percentage sold in the first four months of the year is more than  $1\frac{3}{4}$  times as great as the monthly percentage in the rest of the year. In fact, recently it has been twice as great.

The sales pattern is remarkably consistent from year to year, although there is a tendency to sell more in October and November, as the use of corn combines increases. For example, during the 1955-65 period an average of 28 percent was sold in October and November, but in the last two years of the period the percentages were 34 and 30. The speed of harvest affects the October-to-December distribution. The pattern is the result of four factors: (1) corn from the new crop is stored on farms until its moisture content is low enough to be safe for tight bin storage; (2) corn can be stored easily on farms; (3) many

farmers believe that it pays them to hold corn, and can afford to do so; and (4) some farmers, particularly those who feed considerable amounts of corn, carry over any surplus for sale until they are sure about their new crop.

The development of picker-shellers and corn combines and the high cost of building ear-corn storage space are having a modifying effect on these factors. It remains to be seen whether corn that is harvested shelled will be sold directly to country elevators or whether adequate drying and storage methods will be developed for farm use. In the past, high proportions of the crops that have a small on-farm usage, like wheat and soybeans, have been sold at harvest while corn, oats, and other crops used in large quantities on farms have been sold at a more gradual rate.

The result of having corn sales spread over the year is a small average seasonal increase in corn prices. Sales by producers do not put much pressure on the price structure at harvest, and the spring and summer sales prevent a chronic market shortage from developing.

### Seasonal Variation in Corn Prices

**Averages and their composition.** The recent history of Illinois corn prices is shown in Table 2. An index of seasonal variation<sup>1</sup> was computed from these prices and is shown in Fig. 1. It declines from October to make a harvest low in November and then gradually increases to a June peak when influences of the new crop take over.

The low average was in November at 89.0 percent of the season's average, and the high average was in June at 107.0 percent. The May average was 105.8 and the July average 106.8. In terms of \$1.10 corn, the extreme of the rise was from \$0.979 to \$1.177, or 19.8 cents a bushel. This is consistent with the total costs indicated in the preceding section on storage and more than the variable costs of on-farm storage.

Figure 2 shows the individual indexes of seasonal variation. If these lines all followed a rather similar path, the pattern would be consistent and reliable. Obviously they do not. These are the diverse individual years that make up the rather nice pattern shown in Fig. 1. Therefore Fig. 1 is not a reliable guide for timing the sales of corn.

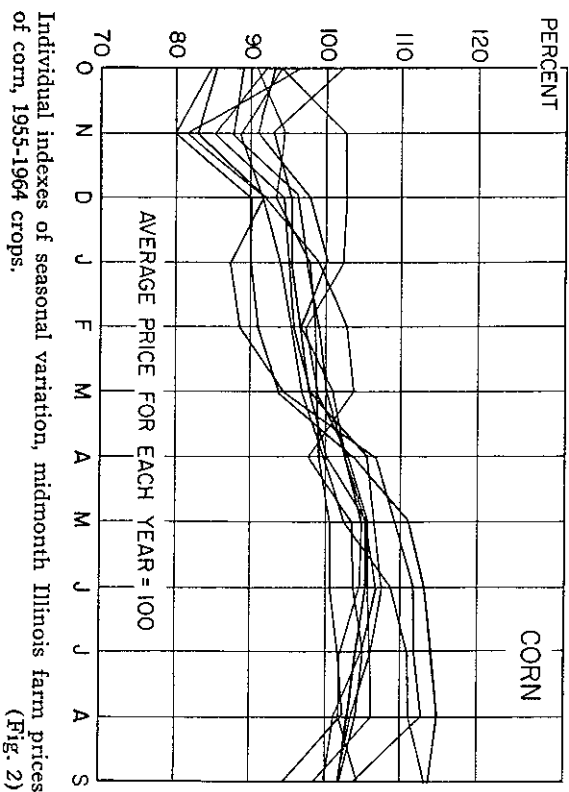
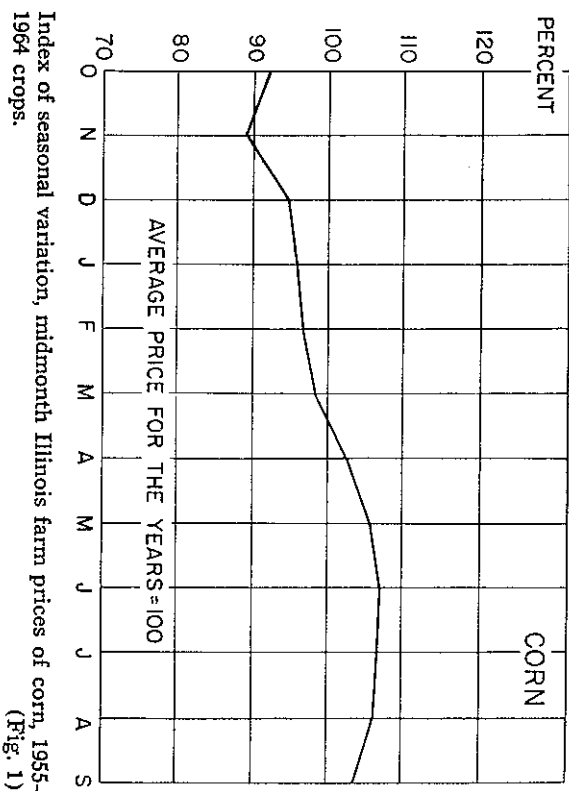
The first lesson that must be learned about the seasonal variation in

<sup>1</sup> This index was computed by averaging the indexes of variation in the individual years. (In computing an index, the average price for a year is set equal to 100 and the individual months are then computed as a percentage of the seasonal average. It is the same as if the price of corn always averaged \$1 a bushel. This index makes it possible to compare different years directly even though their average prices are different.)

Table 2. — Midmonth Illinois Farm Price of Corn, 1955-1965, Dollars per bushel

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Ave.
1955-56.....	1.09	1.02	1.14	1.14	1.16	1.19	1.32	1.41	1.44	1.45	1.46	1.45	1.27
1956-57.....	1.12	1.22	1.23	1.22	1.16	1.18	1.18	1.20	1.20	1.21	1.22	1.13	1.19
1957-58.....	1.04	.98	1.01	.97	.98	1.04	1.18	1.20	1.23	1.23	1.24	1.15	1.10
1958-59.....	1.02	.94	1.04	1.05	1.06	1.08	1.17	1.18	1.19	1.17	1.17	1.09	1.10
1959-60.....	.96	1.00	.99	1.03	1.04	1.04	1.09	1.11	1.11	1.11	1.09	1.07	1.05
1960-61.....	.97	.82	.92	.99	1.03	1.04	.98	1.04	1.04	1.06	1.04	1.02	1.00
1961-62.....	1.00	.91	.94	.94	.95	.96	.98	1.03	1.03	1.02	1.01	1.00	.98
1962-63.....	.94	.91	1.00	1.03	1.05	1.06	1.09	1.12	1.19	1.21	1.21	1.23	1.09
1963-64.....	1.04	1.02	1.10	1.12	1.09	1.13	1.15	1.18	1.17	1.14	1.14	1.17	1.12
1964-65.....	1.05	1.04	1.14	1.16	1.17	1.19	1.22	1.25	1.26	1.24	1.20	1.18	1.18

Source: Illinois Agricultural Statistics.



corn prices is that *there is none if the cost of storage is taken into account*. The reason is simple. The price of corn is bid up as high as it is expected to go, in the combined judgment of all the people in the market, and the cost of storage is subtracted. The change in the price of corn within seasons, again taking storage cost into account, is capricious. It increases and decreases as the combined judgment of the market about the average price changes.

This conclusion that the seasonal price variation goes hand in hand with storage costs is further borne out by the data shown in Tables 3 and 4. The average increase in price from November to January for the 13-year period was 7.4 cents; that from November to March, 8.8 cents; November to May, 15.5 cents; and November to July, 16.7 cents.

Comparing what has happened in various periods in the different years illustrates how results of holding corn vary. By holding from November to July in each of the 13 years a farmer would have gained more than storage seven times and less than storage six times.

Table 4 indicates a marked tendency for the high price to occur in the last half of the crop year and the low price to occur in the first half, which is to be expected because of the cost of storage. It should, however, be noted that there is a substantial chance of the high occurring in December and January and of a decline from harvest to February.

In view of the April 1 personal property tax assessment date in Illinois, it is of special interest to note the March 15 to April 15 price change. The average for the 10-year period was + 4.9 cents. There was one decrease, and one year showed no change. Thus 8 of 10 ex-

Table 3. — Harvest to Specified Months, Corn Price Changes by Years, 1952-1964 Crops

Crop year	Nov. to Jan.	Nov. to Mar.	Nov. to May	Nov. to July	Nov. to high
	<i>(cents per bushel)</i>				
1952-53.....	+ 3	+ 1	+ 3	+ 1	+ 7
1953-54.....	+ 9	+10	+14	+18	+23
1954-55.....	+ 5	- 1	0	0	+ 5
1955-56.....	+12	+17	+39	+43	+44
1956-57.....	0	- 4	- 2	- 1	+ 1
1957-58.....	- 1	+ 6	+22	+25	+26
1958-59.....	+11	+14	+24	+23	+25
1959-60.....	+ 3	+ 4	+11	+11	+11
1960-61.....	+17	+22	+22	+24	+24
1961-62.....	+ 3	+ 5	+12	+11	+12
1962-63.....	+12	+15	+21	+30	+32
1963-64.....	+10	+11	+16	+12	+16
1964-65.....	+12	+15	+21	+20	+22
Average.....	+ 7.4	+ 8.8	+15.5	+16.7	+19.1

Table 4. — Number of Times Each Month Had the High and Low Corn Prices, 1952-1965

(Fractions are the result of the same price, the season's high or low, occurring in more than one month.)

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
High.....	0	0	1½	1	0	0	0	1½	2½	1½	3	1½
Low.....	3	7	0	1	1	0	0	0	0	0	0	1

periences were favorable, and the gains in the plus years were larger than the losses in the other years.

In considering the averages and their composition, three conclusions seem in order:

1. *The odds were in favor of storing corn from harvest to the immediate postharvest period.* The average showed a profit over storage cost. The chances of a substantial profit, even of hitting the season's high, were good, and the chances of a substantial loss were small.

This puts a different complexion on the cost of storage. A high proportion of the storage cost is owning and maintaining facilities. If the conclusion that it pays to store corn in the period immediately after harvest is valid, most of the fixed cost can be written off for the short initial storage period. Many elevators make charges for storage that are less than the usual postharvest increase in price.

2. *The chances of gaining by storing corn past June are not great and dangers of losing are substantial.* The seasonal increase in corn prices is based on payment for storage, and storage during the summer when inventories are low is not valuable, and so there is no regular increase.

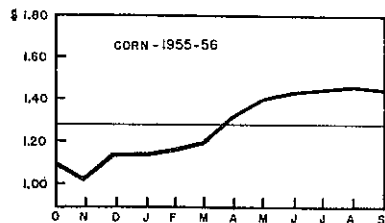
3. *The success of a corn storage operation depends on skill in timing of sales in individual years.* The essence of the problem is being able to do a better job of forecasting the time of the high than is done by the market as a whole.

The last line of Table 3 indicates that the best possible job, as reckoned by midmonth prices, would have resulted in an average price increase of 19 cents during storage.

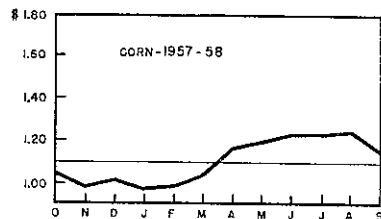
**The individual years.** We learn from history. An examination of the factors affecting seasonal price variation in individual years is a useful guide in deciding when to sell corn in a particular year.

*The following graphs show the individual patterns, midmonth Illinois farm prices of corn, for 10 years. In each case the vertical scale shows the price per bushel, and the straight line is the seasonal average. (For exact price figures, see Table 2.)*

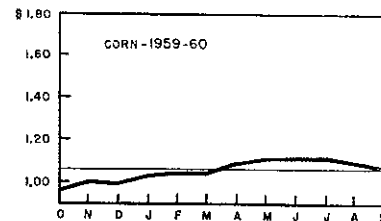




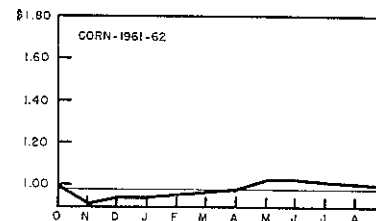
1955-56. This year showed a substantial price rise. The corn crop was large, and the price was pushed down at harvest. Numbers of grain-consuming livestock increased from 161.7 million the preceding year to 165.1. CCC was a light seller in the spring and summer. These three conditions resulted in the largest price gain of the period. The rules applicable in this seasonal price pattern were: 1. large crop; 2. increasing livestock numbers; and 3. small CCC sales.



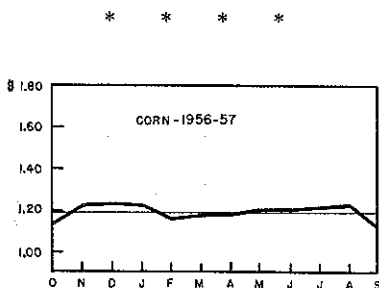
1957-58. The crop was a little smaller than in 1956, and there had been a major increase in carryover from the year before. These conditions discouraged holdings. But both corn exports and the quantity fed increased. The increase in carryover from the 1957 crop amounted to only 50 million bushels, and the loan program was effective. CCC was a light seller. This combination of events resulted in a low price at harvest followed by a 26-cent increase by August.



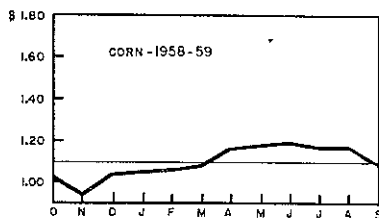
1959-60. The price made a perfect storage cost pattern. During harvest the price declined to an amount equal to the loan minus the full cost of storage, and then it gradually went up to the loan. It failed to go to redemption because loan entries were relatively light. Much of the crop was wet at harvest and thus not eligible for the loan.



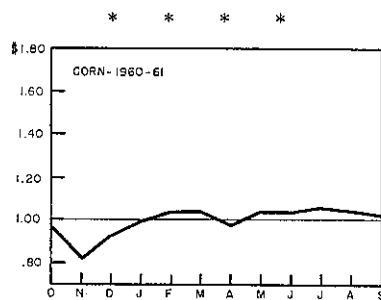
1961-62. The loan rate increased from \$1.06 to \$1.20, resulting in rigorous holding by farmers. Tremendous sales by CCC depressed prices below the loan rate by a wide margin, making corn storage unprofitable in spite of a major increase in demand. The dominant feature was CCC policy.



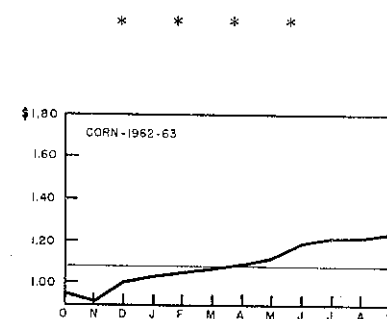
1956-57. The general price pattern was down. Although the crop was very large, there was a minimum of harvest pressure. Livestock numbers declined. A great deal of reliance was placed in the loan, but compliance was small so that the loan program had little effect. CCC sales were large. The familiar rules of livestock numbers, CCC sales, and the year following a major price rise applied.



1958-59. The record crop depressed prices at harvest. Livestock numbers increased from 159.7 to 167.7 million. The resultant increase in carryover was 60 million bushels. With an into-loan movement of 381 million bushels, the price was forced up to the loan plus the cost of redemption. The rule: increasing livestock numbers and large use. In addition, the 1956, 1957, and 1958 experience indicated that the price must go substantially below the loan at harvest if the loan is to be effective.



1960-61. The harvest exceeded storage facilities, and the price was forced down to a very low level. This resulted in a large into-loan movement and an eventual increase in price to the loan level. There was an increase in livestock numbers and corn utilization per animal. Exports also increased. The combination of harvest pressure and increasing demand resulted in an unusually large price increase.



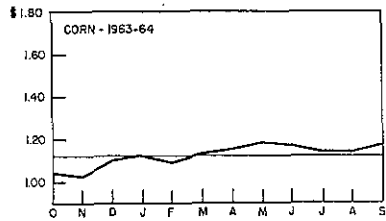
1962-63. The second largest price increase of the period accrued this year. Farmers were ready sellers at harvest on the basis of the price pattern of the preceding year. Domestic and export demands both increased. CCC took the pressure off and the price went up to the loan plus the cost of redemption. The dominant feature was CCC policy.

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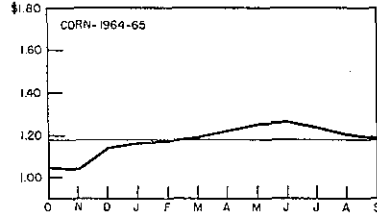
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1963-64. The very large 1963 crop resulted in an increased carryover. As a result the price was dominated by the price-support loan. The price went from moderately below the loan to moderately above.



1964-65. The drought-reduced crop of 1964 resulted in a substantial decrease in carryover. The production-use deficit was supplied by CCC at prices that reflected full costs of storage and that increased as the season progressed, hence the more than usual seasonal price increase.

\* \* \* \*


\* \* \* \*

**Emerging Rules**

From this examination certain rules about seasonal price patterns for corn emerge. Some of these work toward putting the price up and others toward a seasonal decline. The influences complement each other more often than they conflict.

- When there is a short corn crop the price peaks early in the season.
- The price decreases when livestock numbers are declining and increases when they are increasing.
- The price increases during periods of improving general business conditions and declines as unemployment increases.
- When there is a large crop following a short crop there is relatively little price change.
- A second successive large crop results in a larger-than-average price increase.
- The rate of CCC sales has an important influence on price during the spring and summer.
- The support system works effectively when the price is substantially below the loan at harvest. It does not work when the price at harvest is high in relation to the loan.

**WHEN TO SELL**

**Soybeans** 

SOYBEANS ARE THE SECOND MOST IMPORTANT cash grain crop sold by Illinois farmers. In 1963, soybean sales were the fourth largest source of gross farm income in Illinois, accounting for 17.3 percent of the income dollars. Soybeans are exclusively a cash-grain crop — all except seed beans are sold by farmers. Historically, the price of soybeans has fluctuated over wide ranges within marketing seasons.

The size of the crop and the price variability make the timing of soybean sales especially important to Illinois farmers.

**Cost of Storing Soybeans**

Many of the cost items in storing soybeans on the farm are the same as those involved in storing corn. It is not necessary to reckon with moisture, shrinkage, or quality change. Thus the storage facilities, interest, insurance, and taxes are the principal items of cost.

Some soybeans are stored in country elevators, but in recent years there has been a relative increase in on-farm storage. Whether this trend will continue will depend on how costs of storing on farms compare with elevator storage.

Costs may be summarized as follows, assuming \$2.50 soybeans:

	1 month	3 months	6 months	9 months
	<i>(cents per bushel)</i>			
Annual bin cost.....	8.50	8.50	8.50	8.50
Interest at 6 percent.....	1.25	3.75	7.50	11.25
Insurance.....	.35	.60	1.05	1.40
Taxes.....	0	0	3.00	3.00
Total without bin.....	1.60	4.35	11.55	15.65
Total including bin.....	10.10	12.85	20.05	24.15

The annual bin cost listed is the same as that for corn. The basic structure considered is a slat crib with overhead bin space. Costs of the ear corn space and the tight bin space were considered to be the same per bushel.

Storage charges in country elevators vary. However, 1/20 cent a bushel a day is representative. Of the charges listed above, the bin cost and insurance are saved by storing in elevators.

### Sales of Soybeans Are Concentrated

About 45 percent of the soybean crop is sold at harvest. The rest of the sales are fairly evenly distributed over the year. The average percentages of soybeans sold in each month by Illinois farmers in the periods 1953-1965, 1953-1957, 1957-1961, and 1961-1965 were:

	1953-1965	1953-1957	1957-1961	1961-1965
September.....	13	15	12	13
October.....	30	25	32	32
November.....	8	8	9	7
December.....	5	7	5	4
January.....	10	9	9	11
February.....	6	6	5	5
March.....	7	7	8	7
April.....	5	5	5	5
May.....	7	8	7	5
June.....	4	5	4	5
July.....	3	3	3	4
August.....	2	2	1	2

Farmer sales of soybeans have settled down into a stable pattern. There is no significant difference between the first and second halves of the period examined. During the immediate postwar period, sales were very concentrated at the harvest season. But averages can be deceptive. A substantial amount of year-to-year variation remains.

In previous periods, the large sales at harvest severely depressed both soybean and soybean product prices, and a seasonal price increase followed. Recently this pressure has been offset by the increased holding by farmers, plus the development of a futures market system for soybeans and soybean products. Thus to a great extent the reasons why soybean prices formerly increased substantially and regularly no longer exist.

### Seasonal Variation in Soybean Prices

Averages and their composition. Midmonth Illinois farm prices of soybeans during a recent 10-year period are shown in Table 5. The index of seasonal variation, shown in Fig. 3, starts with a harvest low and increases to a seasonal high in May.<sup>1</sup>

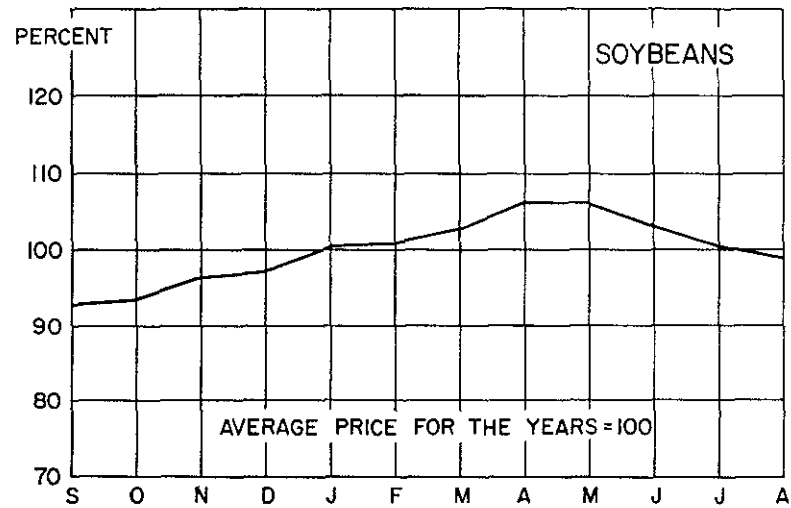
The low average was in September at 92.8 percent of the season's average, and the high average was in May at 106.1. This is a range of 13.2 percent compared with a range for corn of 18.0 percent. Applied to \$2.25 soybeans the average range was 29.7 cents a bushel. The aver-

<sup>1</sup> For an explanation of how indexes of variations are computed and used, see footnote on page 9.

Table 5. — Midmonth Illinois Farm Price of Soybeans, 1955-1965, Dollars per Bushel

	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Ave.
1955-56.....	2.03	2.12	2.12	2.19	2.27	2.33	2.46	2.73	3.06	2.96	2.49	2.38	2.43
1956-57.....	2.09	2.10	2.33	2.33	2.37	2.29	2.30	2.28	2.25	2.20	2.28	2.35	2.26
1957-58.....	2.15	2.09	2.10	2.14	2.12	2.12	2.16	2.21	2.18	2.19	2.18	2.20	2.15
1958-59.....	2.00	1.98	1.96	2.04	2.07	2.09	2.11	2.15	2.19	2.15	2.10	2.01	2.07
1959-60.....	1.93	1.99	2.06	2.03	2.05	2.02	2.03	2.06	2.05	2.02	2.02	2.04	2.03
1960-61.....	2.01	1.99	1.99	2.07	2.31	2.54	2.76	3.14	3.05	2.62	2.46	2.50	2.45
1961-62.....	2.25	2.27	2.33	2.35	2.36	2.36	2.38	2.44	2.42	2.39	2.40	2.38	2.36
1962-63.....	2.26	2.28	2.35	2.39	2.46	2.54	2.54	2.49	2.52	2.53	2.48	2.48	2.44
1963-64.....	2.47	2.59	2.69	2.60	2.70	2.60	2.59	2.48	2.40	2.38	2.37	2.40	2.52
1964-65.....	2.56	2.61	2.66	2.69	2.80	2.85	2.89	2.93	2.78	2.80	2.76	2.57	2.74

Source: Illinois Agricultural Statistics.



Index of seasonal variation, midmonth Illinois farm prices of soybeans, 1955-1964 crops. (Fig. 3)

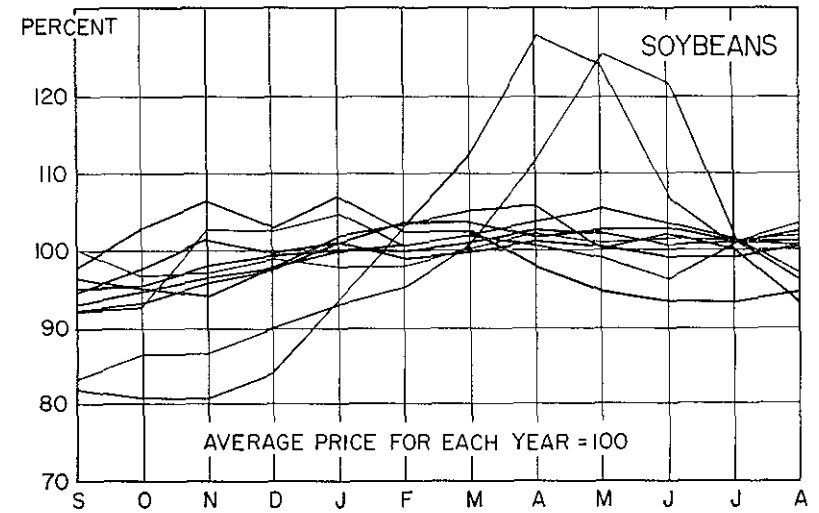
age of the September-to-June increases, reckoned from the actual prices, was 24.9 cents. These are amounts substantially in excess of the cost of storage.

The average price increase from September to June during the last six years of the period was 21.0 cents. This period included one very favorable year. Returns during recent years have been more nearly in line with storage costs than in the earlier years.

The individual indexes of seasonal variation are shown in Fig. 4. As is true for corn, the average is composed of a heterogeneous group of years, with no reliable index of seasonal variation.

Some years ago soybean prices could be expected to increase by more than the cost of storage, but this is now doubtful. As with corn, it appears that on the average the storer of soybeans will just about get back his cost of storage. To make a profit in the long run the individual storer must do a better-than-average job of varying the timing of his sales from year to year. It is not possible for all storers to be better than average.

The results of storing for different periods of time are shown for the individual years in Table 6. For the October-to-June period the increases amounted to more than the cost of storage in four years, and



Individual indexes of seasonal variation, midmonth Illinois farm prices of soybeans, 1952-1964 crops. (Fig. 4)

nine years showed decreases or increases amounting to less than the cost of storage.

The average in Table 6 reveals to what extent profit depends on ability to pick the high month. The premium placed on this skill is becoming greater as the average price increase more closely approaches the cost of storage.

Table 7 indicates that chances are great that the season's low will occur in the fall. The low is not likely to be in the spring but can readily happen at any other time. The season's high is not likely to occur at harvest but may readily occur at any other time. For example, in 1954-55 the high midmonth price was in February, but the single day high occurred on November 3. The season's high was equaled in November, 1959.

The chances are small that there will be an immediate postharvest increase in soybean prices large enough to pay initial storage costs (see Fig. 4 and Table 5). Thus in any one year it is difficult to justify starting a soybean storage operation unless there is a specific reason for expecting an increase in price.

The price at the tail end of the crop year is erratic. There is a pretty good chance of a major change after June, with the price quite apt to go either way.

Table 6. — Harvest to Specified Months, Soybean Price Changes by Years, 1952-1964 Crops

Crop year	Oct. to Jan.	Oct. to Mar.	Oct. to Apr.	Oct. to May	Oct. to June	Oct. to July	Oct. to high
(cents per bushel)							
1952-53.....	+ 2	+12	+ 13	+ 10	- 6	- 31	+ 13
1953-54.....	+45	+87	+121	+118	+111	+115	+121
1954-55.....	+ 1	- 2	- 17	- 24	- 28	- 37	+ 4
1955-56.....	+15	+34	+ 61	+ 94	+ 84	+ 37	+ 94
1956-57.....	+27	+20	+ 18	+ 15	+ 10	+ 18	+ 27
1957-58.....	+ 3	+ 7	+ 12	+ 9	+ 10	+ 9	+ 12
1958-59.....	+ 9	+13	+ 17	+ 21	+ 17	+ 12	+ 21
1959-60.....	+ 6	+ 4	+ 7	+ 6	+ 3	+ 3	+ 7
1960-61.....	+32	+77	+115	+106	+ 63	+ 47	+115
1961-62.....	+ 9	+11	+ 17	+ 15	+ 12	+ 13	+ 17
1962-63.....	+18	+26	+ 21	+ 24	+ 25	+ 20	+ 26
1963-64.....	+11	0	- 11	- 19	- 21	- 22	+ 11
1964-65.....	+19	+28	+ 32	+ 17	+ 19	+ 15	+ 28
Average.....	+15.1	+24.3	+ 31.2	+ 30.1	+ 23.0	+ 15.3	+ 38.1

Table 7. — Number of Times Each Month Had the High and Low Soybean Prices, 1952-1965

(Fractions are the result of the same price, the season's high or low, occurring in more than one month.)

	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
High.....	0	0	½	0	2	1½	½	6½	2	0	0	0
Low.....	7	1½	1½	0	0	0	0	0	0	2½	½	

In considering what happened at the time of the April 1 personal property tax assessment date, we find that the price increased 9 times and decreased 4 from mid-March to mid-April. The average amount of change, without regard to whether it was an increase or decrease, was 12 cents. In 8 of the 13 years the change was greater than the amount of the property tax. Thus the tax assessment should not be considered as a major factor in deciding when to sell soybeans.

**Individual years.** Soybean prices are more difficult to analyze than prices of most other grains. The price is determined by the prices of the two end products, oil and meal, into which nearly all soybeans are processed. The demand structures for these are very different.

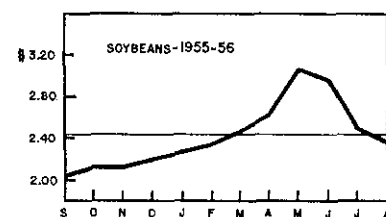
Meal is a livestock feed supplement. Most of it is used in the United States or in comparable livestock economies of northern Europe. The short-run demand is relatively inelastic; that is, a change in the supply results in a greater change in price in the opposite direction.

The domestic demand for edible fats and oils, of which soybean oil is but one, is extremely inelastic; a change in price has virtually no effect on consumption. A good share of soybean oil is exported into a complex of numerous edible fats and oils in world trade.

There has never been a substantial carryover of soybeans. The tendency for soybean supplies to nearly run out each year adds to the variability of soybean prices.

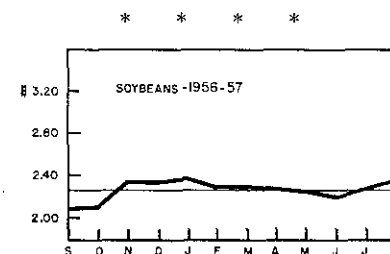
Following are some of the more important considerations of price changes in the postwar period.

The accompanying graphs show the patterns, midmonth Illinois farm prices of soybeans, for the individual years. In each case the vertical scale shows the price per bushel, and the straight line is the seasonal average. (For exact price figures, see Table 5.)

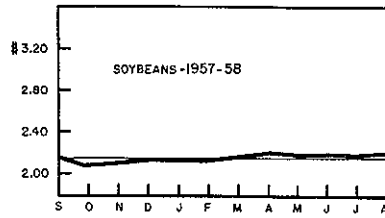


and a subsequent summer collapse. The price started too low, consequently went too high, and finally declined. This is a fairly familiar pattern—a large price increase is usually overdone.

**1955-56.** Several factors combined to generate a \$1.00 seasonal increase. The effects of a moderately larger crop than in 1954 and the declining prices of the previous year reduced the harvest price to below the point at which the old crop price had ended. The low price of meal during the first half of the season generated a large usage base. Livestock numbers increased in the spring. On the oil side, there was a big demand and rapidly rising price as the result of government-stimulated oil exports. This was the first big year of Public Law 480, and its impact was not known. As a result, the price started up slowly, then rose sharply. The rapid spring rise in oil and meal prices resulted in too much speculative enthusiasm in soybeans

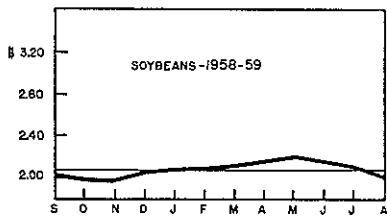


**1956-57.** The crop size was increased, up 75 million bushels from the preceding year, and no hope of getting rid of the entire supply seemed likely. But the rate of meal utilization at a moderate price was underestimated. As soon as another large P.L. 480 oil program became apparent the oil price increased rapidly. The effect of P.L. 480 was overestimated with a subsequent long-term decline in oil prices. The July and August increase was the result of a sharp rise in meal prices.



1957-58. This was a loan-dominated year. There was a major increase in crop size, and a substantial carryover became apparent. CCC took over enough soybeans to dominate the summer market. Thus the price went from enough below the loan to encourage storage to enough above the loan to draw soybeans from CCC. Use of soybean meal, at moderate prices, expanded rapidly, and the price rose sharply during the summer. The increasing meal price did not take the price of soybeans up because of increased carryover.

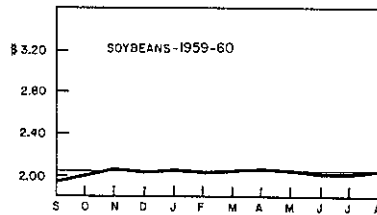
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1958-59. This was a second successive loan-dominated year. The crop size was increased again, up 20 percent from 1957. Exports of soybeans increased substantially. Hog numbers expanded and resulted in a large use of meal and a rising meal price. In spite of the rapidly expanding disappearance

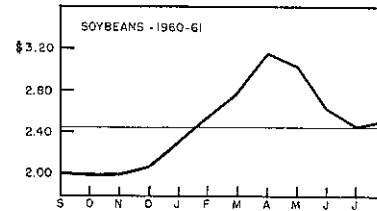
there was a substantial increase in carryover owned by CCC. The decline in the summer was the result of too much purchasing of soybeans from CCC immediately after its takeover date of June 1. The users bought nearly all they needed from the government, leaving farmers with substantial inventories. The surplus carried over by CCC was located west of the Mississippi, and supplies in Illinois ran out. As a result, the price in Illinois went up more than is usual in a loan-dominated situation.

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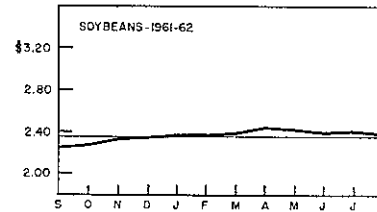
1959-60. The price went essentially sidewise all season. As the result of a substantial price rise the preceding year, and a reduction in the crop size, farmers held unusually large amounts in storage and speculators bought aggressively. The speculative enthusiasm for soybeans forced the price too high too soon. As a result, soybean meal was priced out of the domestic market, eventually resulting in a decline in soybean prices. The CCC held its stocks from the previous year at substantial premiums over the loan. This prevented a more extreme decline in the summer.

\* \* \* \*



1960-61. This year showed a very large price increase, comparable to 1953-54. The crop was moderately larger but the total supply was less because of a reduced carryover. The supply was not adequate to provide for a normal market growth. As a result of little seasonal increase in the preceding years, farmers were liberal sellers at harvest. The market did not quickly appreciate that an opportunity for increased use results in serious shortage. The resultant price increase was augmented by the accumulation of soybean oil inventories in anticipation of large exports financed by the government. When these failed to materialize, the price collapsed.

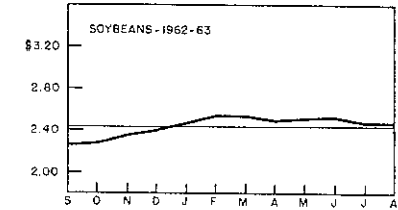
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1961-62. Production increased by more than 100 million bushels, or about 20 percent. A substantial inventory was accumulated by CCC. This, then, was a loan-dominated year. The price went far enough below the loan at harvest to make storage for the loan profitable, and high enough in the

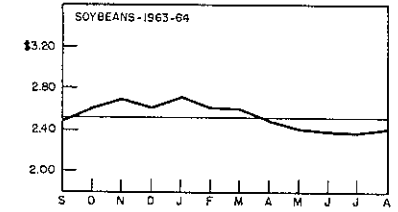
spring to enable producers to redeem some of the soybeans that had been placed in the loan.

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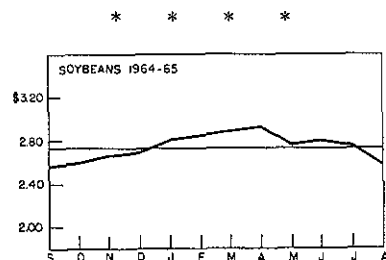
1962-63. Although the crop was not larger, the big increase in carryover made the supply appear larger than could be used up. Hence the loan structure was expected to dominate the price, and prices declined below loan levels at harvest. As the season progressed, substantial discrepancies appeared between actual stocks and those expected based on production. The rather low harvest prices generated a high rate of use that required a price increase to ration supplies until the new crop became available.

\* \* \* \*



1963-64. The price increased sharply immediately after the harvest as a result of purchases of wheat by Russia which were expected to extend to soybeans. They did not. In late November the great salad oil scandal broke, and the price declined sharply. Farmers held unusually large quantities, and the

price was forced to its season's peak in January. The January peak and subsequent long decline were the result of over-holding by farmers.



1964-65. There was an excellent crop prospect until late August when bad weather caused a major reduction in yield. The full extent of the damage was not known until the latter part of December. The rate of disappearance was large, and the shortage was confirmed in January. The knowledge of the shortage resulted in the price going too high in April and declining into summer.

### Emerging Rules

It is difficult to extract a useful set of rules about seasonal soybean price patterns. The factors affecting prices are complex. The average farmer does not have the detailed knowledge needed to predict changes. In fact, it is unlikely that anyone does. However, some generalizations can be made.

- It is difficult to overestimate the rate of demand expansion for soybeans — substantially more can be used each year at a constant price. Exports increased from 13 million bushels to 212 million bushels in the period 1949-65. The quantity processed into oil and meal increased from 195 million to 476 million bushels during the same period. The rule seems to be that when conditions of supply and price are the same as the year before, it is best to hold for a price rise — an increase in some facet of demand is very likely to occur.
- A comparatively short crop usually peaks early.
- The price of oil is sensitive to the world supply and demand situation and tends to move in long cycles. All other things being equal, the price of soybeans moves in the direction of oil prices.
- The price of meal is sensitive to changes in livestock numbers, particularly hogs. Hold soybeans when an increase in the spring pig crop is anticipated.
- Meal consumption is responsive to price. A high price for meal in the fall and winter often results in a decreasing price in the spring and summer, and vice versa.

- The price of soybeans is responsive to general inflation-deflation conditions and moves in general sympathy with the prices of other commodities. It is also very sensitive to news of international unrest.
- Speculative activity in both cash and futures by farmers and others is very important in determining the seasonal pattern of prices. There is a tendency to put the price either too high or too low at harvest and a tendency to remember only last year. This yields an every-other-year flavor to soybean holding. Thus the most profitable procedure might well be to do what would have been unprofitable the year before.

## WHEN TO SELL

# Oats

ABOUT 29 PERCENT OF THE OATS produced in Illinois is sold off of the farms where grown. This amounts to about 23 million bushels a year, and oats accounted for 0.8 percent of the gross farm income in 1963. Production and sale of oats are concentrated in the northern half of the state.

### Cost of Storing Oats

The principal items of cost in storing oats are structure cost, interest, insurance, and taxes.

Most oats are stored on farms. Whether or not there should be a bin cost charged against oats depends upon the individual farm situation. The annual bin cost used below is the same as that for corn and soybeans because the space for oats is, in general, considered as a part of an integrated storage unit.

Costs may be summarized as follows, assuming 60-cent oats:

	1 month	3 months	6 months	9 months
	<i>(cents per bushel)</i>			
Annual bin cost.....	8.50	8.50	8.50	8.50
Interest at 6 percent.....	.30	.90	1.80	2.70
Insurance.....	.08	.15	.25	.34
Taxes.....	0	0	0	.90
Total without bin.....	.38	1.05	2.05	3.94
Total including bin.....	8.88	9.55	10.55	12.44

The charges for storing in country elevators vary. However, 1/20 cent a bushel a day is representative. Of the above charges, the bin cost and insurance are saved by storing in elevators.

### Sales of Oats Are Moderately Concentrated

About 45.5 percent of oats sales by farmers occur during the harvest months of July and August. The following figures (top of next page) show the average percentages of oats sold in each month by Illinois farmers in the 1955-1965 period.

July.....	33	October.....	3	January.....	8	April.....	6
August.....	14	November...	2	February....	7	May.....	6
September..	5	December...	4	March.....	7	June.....	5

Sales are reduced to very low levels through November and are fairly evenly distributed from December through June. The sales pattern indicates that farmers do not consider oats an important storage crop.

### Seasonal Variation in Oats Prices

**Averages and their composition.** Midmonth Illinois farm prices of oats during a recent 10-year period are shown in Table 8. The index of seasonal variation<sup>1</sup> is shown in Fig. 5. It starts with a harvest low, increases to January, and declines for the rest of the season.

The low average was in August at 95.2 percent of the season's average, and the high average was in January at 106.0. This is a range of 10.8 percent compared with 13.2 for soybeans and 18.0 percent for corn. Applied to 60-cent oats the average range was 6.5 cents, an amount less than the full cost of storage.

The individual indexes of seasonal variation are given in Fig. 6. In contrast to corn and soybeans these make a fairly consistent pattern of a harvest low, a winter high, and a spring decline. There is a considerable difference in amount of seasonal variation.

Results of storage for different lengths of time are shown in Table 9. The July-to-January period shows the largest gain. The 6.7-cent average is less than the cost of storage. The July-to-January increase was greater than the full cost of storage four times and less than the full cost nine times. It does not pay to store oats unless storage space is readily available. The return for storing from July to January was less than the variable costs only three times.

The average in Table 9 shows the result of picking the right month to sell oats each year — holding from July to the high month averaged only 0.8 cent more than holding until January. Thus there was much less advantage to the skilled speculator than for either corn or soybeans.

The season's low (Table 10) nearly always occurred near harvest or at the very end of the crop year. The price went up from the harvest low in all years but one.

There was a concentration of season's highs in the winter, with the chances of hitting the season's high by always selling in January being relatively great.

<sup>1</sup> For an explanation of how indexes of variations are computed and used, see footnote on page 9.



Table 8. — Midmonth Illinois Farm Price of Oats, 1955-1965, Dollars per Bushel

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Ave.
1955-56.....	.55	.50	.51	.55	.57	.60	.60	.58	.59	.59	.61	.62	.57
1956-57.....	.64	.66	.65	.65	.71	.73	.74	.69	.68	.68	.68	.64	.68
1957-58.....	.61	.61	.62	.61	.62	.63	.63	.61	.62	.62	.60	.57	.61
1958-59.....	.57	.56	.54	.53	.55	.59	.61	.60	.60	.62	.61	.60	.58
1959-60.....	.61	.62	.61	.64	.70	.71	.72	.69	.70	.71	.71	.67	.67
1960-61.....	.64	.61	.60	.57	.54	.58	.61	.61	.59	.56	.60	.59	.59
1961-62.....	.63	.60	.62	.58	.61	.64	.65	.61	.62	.63	.66	.62	.62
1962-63.....	.60	.58	.60	.59	.62	.68	.69	.69	.69	.68	.67	.65	.64
1963-64.....	.61	.61	.63	.63	.63	.66	.68	.65	.64	.63	.61	.59	.63
1964-65.....	.57	.59	.61	.62	.63	.66	.69	.68	.67	.69	.69	.68	.65

Source: Illinois Agricultural Statistics.

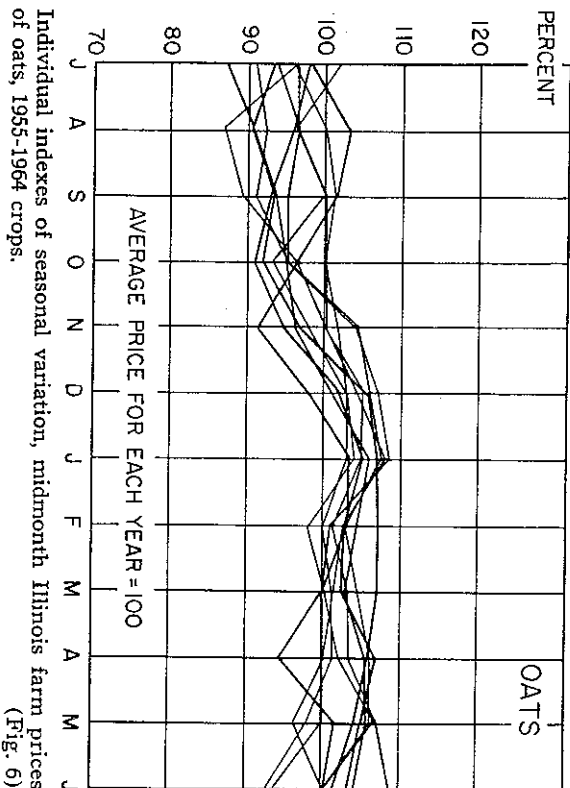
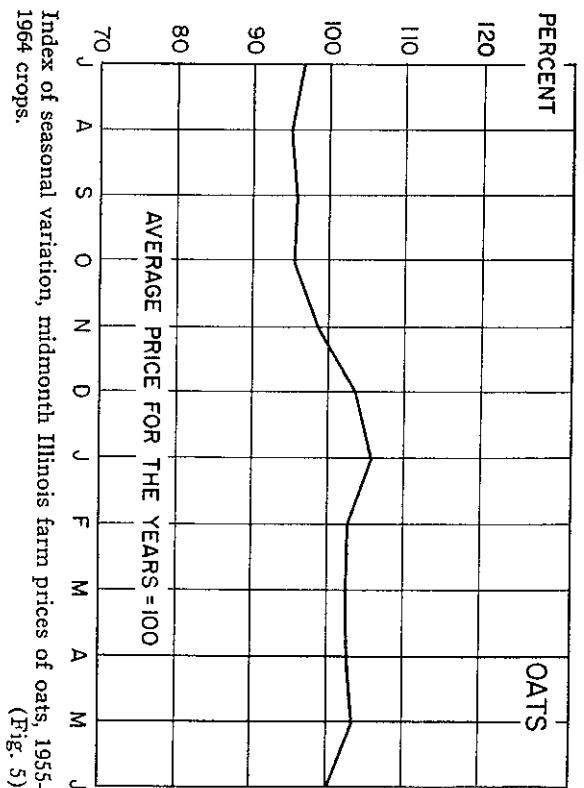


Table 9. — Harvest to Specified Months, Oat Price Changes by Years, 1952-1964 Crops

Crop year	July to Sept.	July to Jan.	July to Mar.	July to May	July to high
(cents per bushel)					
1952-53.....	+9	+ 7	+ 1	- 1	+10
1953-54.....	+2	+ 9	+ 8	+ 5	+ 9
1954-55.....	+6	+12	+ 6	+ 4	+12
1955-56.....	-4	+ 5	+ 4	+ 6	+ 7
1956-57.....	+1	+10	+ 4	+ 4	+10
1957-58.....	+1	+ 2	+ 1	- 1	+ 2
1958-59.....	-3	+ 4	+ 3	+ 4	+ 5
1959-60.....	0	+11	+ 9	+10	+11
1960-61.....	-4	- 3	- 5	- 4	0
1961-62.....	-1	+ 2	- 1	+ 3	+ 3
1962-63.....	0	+ 9	+ 9	+ 7	+ 9
1963-64.....	+2	+ 7	+ 3	0	+ 7
1964-65.....	+4	+12	+10	+12	+12
Average.....	+1	+ 6.7	+ 4	+ 3.9	+ 7.5

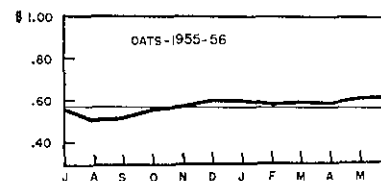
Table 10. — Number of Times Each Month Had the High and Low Oat Prices, 1952-1965

(Fractions are the result of the same price, the season's high or low, occurring in more than one month.)

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
High.....	1	0	0	0	5/8	1 1/8	5	5/8	1/8	1 1/8	1 1/8	1
Low.....	4	2	1/2	2	1	0	0	0	0	0	0	3 1/2

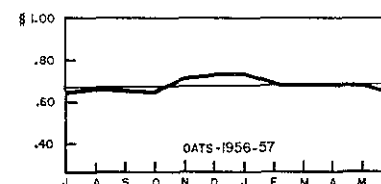
**The individual years.** In most of the years, oat prices tended to follow a characteristic seasonal pattern, but there were some interesting variations.

The following graphs show the patterns, midmonth Illinois farm prices of oats, for the individual years. In each case the vertical scale shows the price per bushel, and the straight line is the seasonal average. (For exact price figures, see Table 8.)



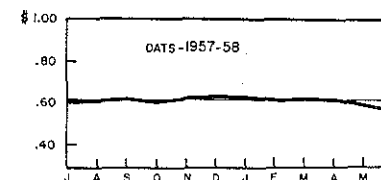
1955-56. Departure from the usual seasonal prices in the spring months was the result of increasing corn prices. The corn prices tended to bring up oat prices.

\* \* \* \*



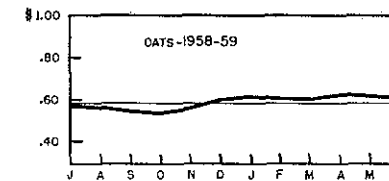
1956-57. Prices in this year almost exactly matched the average seasonal pattern.

\* \* \* \*



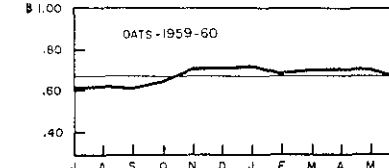
1957-58. The Illinois oat crop was very small, resulting in a pattern typical of a short-crop year. The oat price in the state was independent of the average for the United States. The U. S. crop was larger than the year before and the price followed normal seasonal behavior.

\* \* \* \*



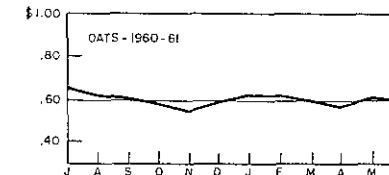
1958-59. This was the usual pattern, with relative strength in the spring as the result of expanding livestock numbers and an increasing corn price.

\* \* \* \*



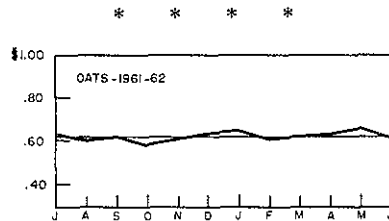
1959-60. The 1959 crop was small, but it was accompanied by a record corn crop. The extent to which oat prices could go to a premium over corn prices was not realized at harvest. Consequently the rise from harvest to winter was large, and the strength held well through the balance of the season.

\* \* \* \*

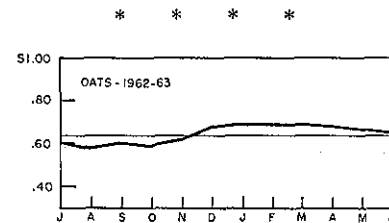


1960-61. In this year the first serious reversal of form was encountered. There was a substantial decline from the harvest price, which was the high for the year. The high price of the preceding

spring carried over into the new crop. The 1960 crop was large enough so that farmers had a substantial salable surplus at prices that were quite high in relation to corn. The severe price decline in corn pulled the price of oats down too.

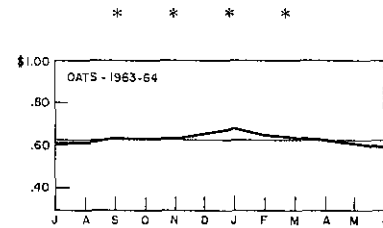


1961-62. The price pattern of the preceding year was repeated, but in moderate form. The strong soybean-holding movement forced some oats onto the market to make space available. The seasonal peak was reached about on schedule.

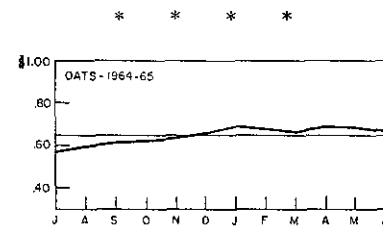


1962-63. The season's low price came soon after harvest and there

was a sharp increase into winter. The more-than-usual increase in corn prices lent strength to oats during the summer.



1963-64. Followed the normal seasonal pattern of a January high and a decline into spring.



1964-65. There was the usual seasonal pattern with regard to time, but the harvest-to-January increase was greater than usual and the spring decline smaller. The corn price increase was also great.

\* \* \* \*

### Emerging Rules

The typical seasonal variation in oat prices cannot be rationally explained in terms of storage cost. On the face of the matter it appears that a speculative error is made repeatedly. The nature of the error is the overholding of inventories during the fall and winter months. We can only theorize about the various reasons for the error. A major factor, of course, is the very low rate of sales off of farms during the several months immediately following harvest. Many farmers appear to pay little attention to oat prices when they are preoccupied with the soybean and corn harvest. They put oats away and forget them.

A second factor may be the holding of oats by farmers, elevators, and users as a sort of insurance policy against a possible shortage in the spring and early summer.

Certain rules about the individual year seasonal price variations appear:

- In the absence of some unusual circumstance, oats should be sold in the December-to-February period.
- Oat prices move in fairly close sympathy with corn prices.
- Increasing livestock numbers, particularly hogs, result in relatively strong spring prices, and decreasing livestock numbers result in relatively weak spring prices.
- Oat prices are moderately sensitive to general conditions of inflation and deflation.

# WHEN TO SELL

# Wheat



NEARLY ALL OF THE WHEAT produced on Illinois farms that is not needed for seed is sold off of the farms where grown. Wheat production in Illinois averaged 53 million bushels a year during the 1952-1964 period. Sales of wheat accounted for 5.5 percent of gross farm income in 1963.

### Cost of Storing Wheat

Relatively small amounts of wheat are stored on farms because it is difficult to maintain quality. Accordingly, the following tabulation is based on a standard storage charge of 1/20 cent a bushel a day.

Costs may be summarized as follows, assuming \$1.90 wheat:

	1 month	3 months	6 months	9 months
	<i>(cents per bushel)</i>			
Storage.....	1.50	4.55	9.15	13.69
Interest at 6 percent.....	.95	2.85	5.70	8.55
Taxes.....	0	0	0	2.70
Total.....	2.45	7.40	14.85	24.94

### Sales of Wheat Are Concentrated at Harvest

Eighty-six percent of the wheat produced in Illinois is sold during the harvest months of June, July, and August. Following harvest the amount sold each month gradually declines. These figures show the average percentages of wheat sold in each month by Illinois farmers in the 1955-1965 period:

July.....	64	October.....	1	January.....	2	April.....	1
August.....	8	November...	2	February....	1	May.....	1/2
September..	3	December...	1	March.....	1	June.....	15

### Seasonal Variation in Wheat Prices

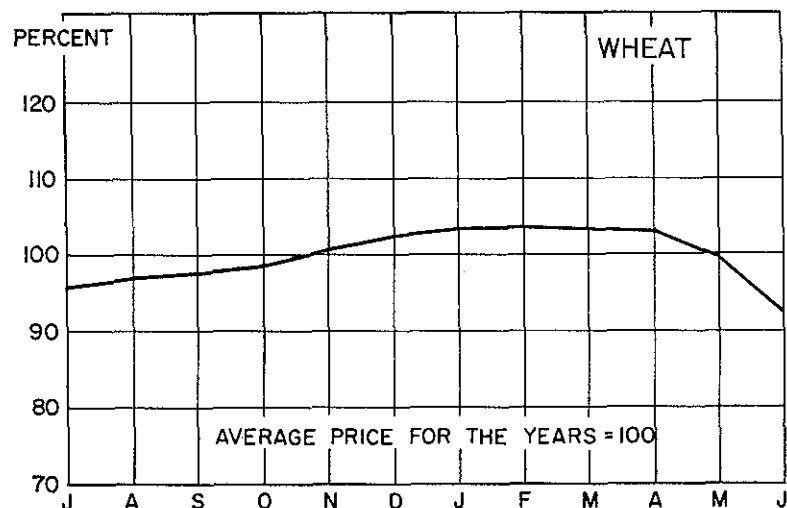
Averages and their composition. Midmonth Illinois farm prices of wheat are shown in Table 11. The index of seasonal variation<sup>1</sup> is

<sup>1</sup>For an explanation of how indexes of variation are computed and used, see footnote on page 9.

Table 11. — Midmonth Illinois Farm Price of Wheat, 1952-1965, Dollars per Bushel

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Avg.
1955-56.....	1.85	1.78	1.77	1.81	1.81	1.92	1.94	1.99	2.00	2.10	1.98	1.90	1.90
1956-57.....	1.86	1.96	2.03	2.03	2.13	2.19	2.20	2.14	2.12	2.04	1.95	1.84	2.04
1957-58.....	1.94	1.97	1.94	1.93	1.95	2.00	2.00	2.00	2.05	2.03	1.96	1.71	1.96
1958-59.....	1.66	1.64	1.65	1.72	1.72	1.75	1.78	1.83	1.88	1.85	1.69	1.66	1.74
1959-60.....	1.74	1.77	1.80	1.82	1.87	1.85	1.89	1.88	1.91	1.91	1.87	1.73	1.84
1960-61.....	1.72	1.77	1.80	1.82	1.83	1.88	1.92	1.91	1.88	1.75	1.72	1.74	1.81
1961-62.....	1.78	1.85	1.86	1.85	1.88	1.92	1.91	1.90	1.92	1.97	2.01	2.03	1.91
1962-63.....	2.04	2.00	1.98	1.94	1.98	1.90	2.01	2.00	2.00	2.05	2.01	1.83	1.98
1963-64.....	1.78	1.81	1.85	1.95	2.02	2.05	2.09	2.09	1.92	1.96	1.92	1.38	1.90
1964-65.....	1.36	1.37	1.41	1.41	1.44	1.45	1.45	1.45	1.45	1.43	1.37	1.32	1.41

Source: Illinois Agricultural Statistics.



Index of seasonal variation, midmonth Illinois farm prices of wheat, 1955-1964. crops. (Fig. 7)

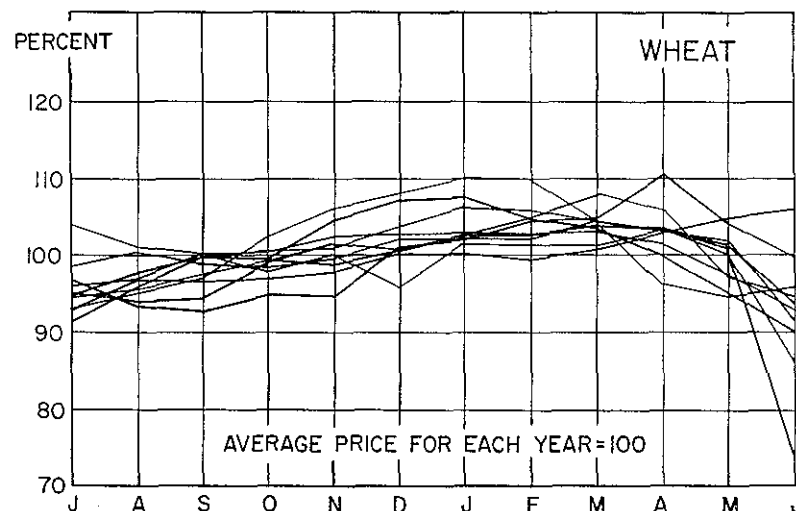
shown in Fig. 7. It increases from a harvest low to a February high, remains relatively stable through April, and declines sharply during the last two months of the season.

The low average (excepting June, which perhaps should be considered to be at the beginning of the crop year rather than the end) was in July at 95.9 and the high in February was 103.8. This range of 7.9 compares with 18.0 percent for corn, 13.2 for soybeans, and 10.8 for oats. Applied to \$1.90 wheat, the average range was 15.0 cents a bushel, an amount less than the cost of storage for nine months. The average July-to-January increase was 7.9 percent, the equivalent of 15 cents, which was about the same as the cost of storage.

The individual indexes of seasonal variation for wheat are shown in Fig. 8. They are the most stable of the indexes for the four grains. There is a substantial difference in the amount of variation from year to year, but the general pattern is quite consistent.

Results of storage for different lengths of time are shown in Table 12. The July-to-March period shows the largest average gain.

The most advantageous period for storage, on the average, was from July to January. From harvest to January the average result was to just about recover storage cost. The average gain after January was less than the cost of storage.



Individual indexes of seasonal variation, midmonth Illinois farm prices of wheat, 1955-1964 crops. (Fig. 8)

Table 12. — Harvest to Specified Months, Wheat Price Changes by Years, 1955-1964 Crops

Crop year	July to Sept.	July to Nov.	July to Jan.	July to Mar.	July to May	July to high
	(cents per bushel)					
1952-53.....	+ 7	+ 9	+ 4	+ 4	- 9	+ 9
1953-54.....	+ 5	+11	+23	+44	+11	+44
1954-55.....	+17	+20	+27	+19	+16	+27
1955-56.....	- 8	- 4	+ 9	+15	+13	+25
1956-57.....	+17	+27	+34	+26	+ 9	+34
1957-58.....	0	+ 1	+ 6	+11	+ 2	+11
1958-59.....	- 1	+ 6	+12	+22	+ 3	+22
1959-60.....	+ 6	+13	+15	+17	+13	+17
1960-61.....	+ 8	+11	+20	+16	0	+20
1961-62.....	+ 8	+10	+13	+14	+23	+25
1962-63.....	- 6	- 6	- 3	- 4	- 3	- 1
1963-64.....	+ 7	+24	+31	+14	+14	+31
1964-65.....	+ 5	+ 8	+ 9	+ 9	+ 1	+ 9
Average.....	+ 5	+10	+15	+16	+ 8	+21

the right month to sell wheat has a very decided effect on the returns from storage. This is true not only because of differences in the time of the high price, but also because of the great variability in the cost of storing wheat.

The season's low price (Table 13) almost always occurred either near harvest or at the end of the season. If May and June are omitted, the season's low occurred in July ten times, in August once, in September once, and in October once. Thus the low is apt to occur at or near harvest. In every year except one the price went up from July to the winter period.

There was a wide distribution in the months in which the season's high occurred. The odds do not favor any one month for the season's high.

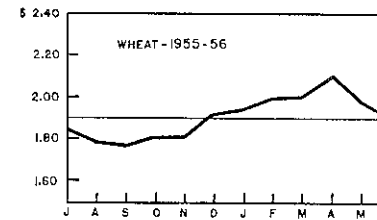
Table 13. — Number of Times Each Month Had the High and Low Wheat Prices, 1952-1965

(Fractions are the result of the same price, the season's high or low, occurring in more than one month.)

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
High.....	0	0	0	0	1	¼	¾	¾	¾	2½	0	1
Low.....	2½	1	1	0	0	0	0	0	0	0	½	8

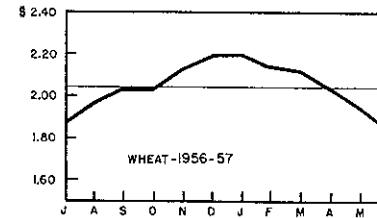
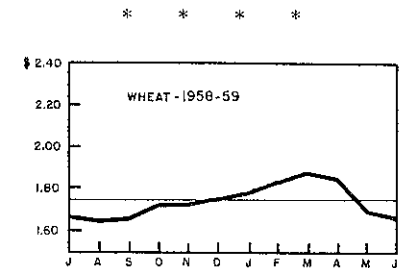
The individual years. Wheat has shown a marked tendency to follow a normal seasonal price pattern (see Fig. 8). However, substantial individual variations are of interest.

The following graphs show the patterns, midmonth Illinois farm prices of wheat, for the individual years. In each case the vertical scale shows the price per bushel, and the straight line is the seasonal average. (For exact price figures, see Table 11.)



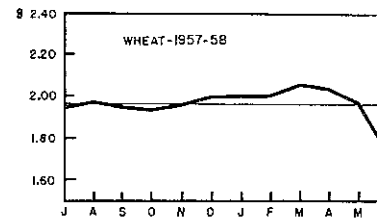
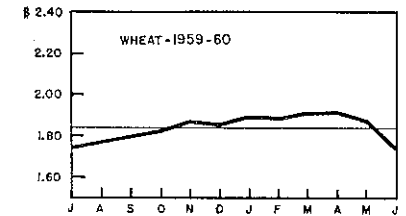
1955-56. Because of a relatively large crop east of the Mississippi, and a weak price at the end of the preceding season, the price was low at harvest. Total wheat supplies were relatively short, and there was no increase in carryover. Free supplies were finally tight.

smaller than in 1956, and the carry-over appeared likely to decrease. The harvest price was strong in relation to the loan because of the rise the year before. This resulted in a small into-loan movement, and as a result free supplies never got very tight.



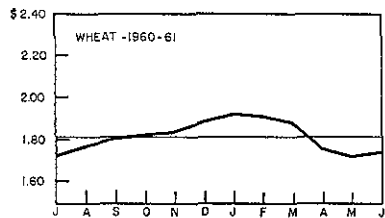
1956-57. The price went below the loan at harvest, encouraging use of the loan. The subsequent rise was the result of an apparent decrease in carryover. CCC sales for export pre-empted the market the second half of the year. Free supplies backed up and the price declined.

1958-59. The crop was unusually large, and this forced the price low at harvest. The low harvest price resulted in a large into-loan movement and eventual tightness in free supplies.



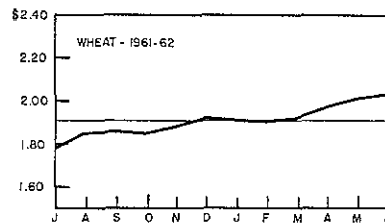
1957-58. The wheat crop was

1959-60. The crop size was about equal to total disappearance for the season, requiring only moderate loan entries to force the price up. But with the price relatively high at harvest, farmers east of the Mississippi made little use of the loan, and nearly all of the season was needed to get the price up to the loan.



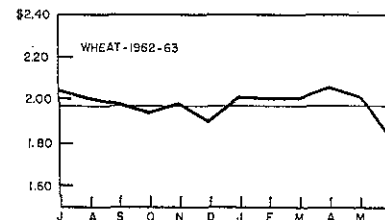
1960-61. The classical price pattern of harvest low to winter high, which depends upon loan action, was followed. The subsequent spring decline was more severe than usual because exports of soft wheat failed to materialize as expected. This left a substantial carryover east of the Mississippi that was not protected by the loan.

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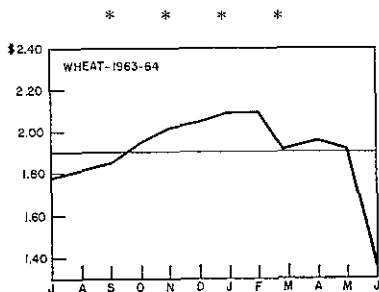
1961-62. The pattern into the winter was essentially the same as in the preceding year. The rise continued into the new crop year with the seasonal peak occurring in June. Exports of soft wheat were larger than had been anticipated, leaving virtually no free carryover.

\* \* \* \*



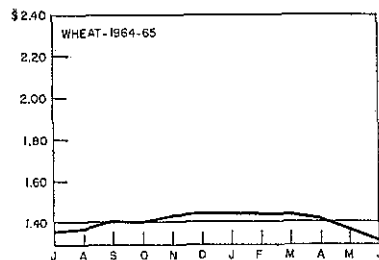
1962-63. Strength carried over

from the old crop year and as a result the harvest price was high enough so that little use was made of the loan. The season's low, for all practical purposes, was made in December and the subsequent increase was moderate. The price must be low at harvest for the loan to be effective.



1963-64. Supplies were abundant so that the price stayed near the loan early in the season. Purchases of wheat by Russia and China in world markets put prices up sharply in the fall and winter. Wheat was held too long by producers and declined from a winter peak.

\* \* \* \*



1964-65. The loan was reduced drastically. Prices were high in relation to the loan at harvest. The limited use made of the loan resulted in large free stocks and a small seasonal increase.

\* \* \* \*

### Emerging Rules

The typical seasonal pattern of wheat prices can be explained in terms of storage cost up to the late winter. The explanation of the consistent spring decline must rest on something else. As in the case of oats, we can only theorize. The speculative error that has been made in wheat appears to have been caused by an over-reliance on the loan and underestimating of the importance of governmental inventory operations. There must be an into-loan movement substantially greater than the increase in carryover because of government sales if the price is to be forced up to the loan.

Certain rules about individual years appear:

- Wheat prices are sensitive to international disturbances.
- Wheat prices follow general inflation and deflation trends.
- In the absence of other factors, a short crop peaks early.
- There is an every-other-year tendency in price patterns. A successful holding year is apt to be followed by an unsuccessful one.
- Throughout the period, government actions, particularly with regard to exports, played an important part in seasonal patterns.