

Comparative Costs of Grain Storage on Farms and in Elevators

By

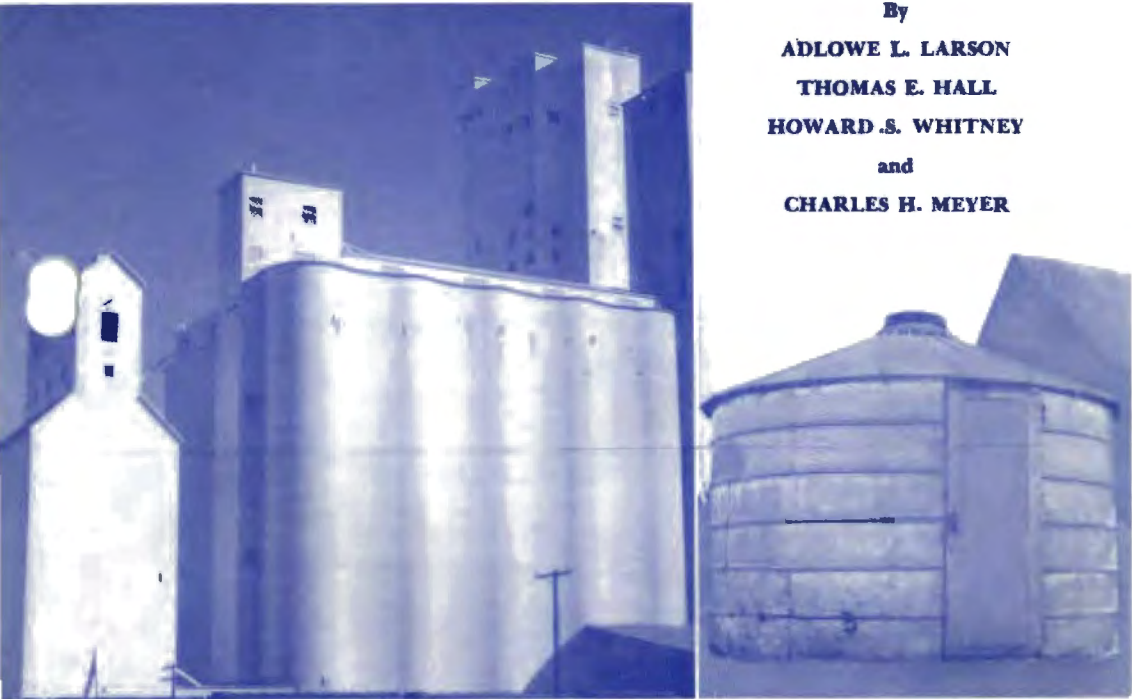
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The Gist of It.

Information on the costs involved in storing grain on farms and in elevators was obtained by interviewing 201 farmers and 73 local elevator operators in various communities scattered throughout the wheat-producing area of western Oklahoma.

From the information thus obtained, it is concluded that:

(1) For farmers constructing new storage, the average annual cost of storing grain on the farm was 53 percent higher than at country elevators.

(2) In the average case, if commercial storage is available, it does not pay the farmer to use his own farm storage already constructed, nor would it pay him to use storage bins that might be provided to him without charge.

(The conclusions refer to relatively permanent storage of grain being held under loan or for sale. They do not refer to temporary storage, perhaps a few weeks, when commercial facilities are not available. Nor do they refer to on-farm storage for grain to be used as feed or seed.)

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Comparative Costs of Grain Storage On Farms and in Elevators

By ADLOWE L. LARSON, THOMAS E. HALL, HOWARD S. WHITNEY,
and CHARLES H. MEYER*

Farmers who produce grain to be marketed through commercial channels are confronted with the problem of providing adequate storage space at harvest time. Most producers do not sell their crop as harvested, but desire to sell from storage later in the marketing season. They may wish to hold the grain for anticipated higher prices, or to place it in the government loan program.

From the farmer's viewpoint, two positions of storage are of primary concern, on-farm and off-farm. Most farmers provide adequate farm storage for feed and seed. The question arises, however, as to what portion of the needed storage space for cash grain** should be provided on the farm and what portion should be obtained from local and terminal elevators. The answer to this question rests upon the relative costs to the farmer of storing at the two positions.

Recent developments in the methods of harvesting and marketing grain have tended to cause farmers to be more concerned about the position of cash grain storage. Combine-harvested grain, especially when custom cut, is not always in storable condition for the usual

types of farm storage. Also, it moves into local elevators in a shorter period of time; and, in many cases, the local facilities are not adequate to handle the peak load at harvest time. Added to the problem has been the shortage of railroad cars to transport the grain from local to terminal markets.

In view of the current interest in the problem of grain storage, the Experiment Station, in cooperation with the Farm Credit Administration, conducted a study to determine the relative costs to the producer of storing grain on the farm as compared to storing in local and terminal elevators. This bulletin is a report of that study.***

Results of the study indicate the following general conclusions:

1. For farmers constructing new storage, the average annual cost of storing cash grain on the farm was 53 percent higher than at country elevators.
2. In the average case, if commercial storage is available, it does not pay the farmer to use his own farm storage already constructed, or to use farm storage bins that might be provided free to him.

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** Cash grain is grain that will not be consumed on the farm, but will be sold through commercial outlets. For Oklahoma almost all of the cash grain is wheat.

*** The study was supported entirely by funds authorized under the Research and Marketing Act of 1946.

These conclusions are based on interviews with 201 farmers and 73 local elevator operators distributed throughout the grain-producing area of Western Oklahoma. The

data presented were obtained from November, 1948, to May, 1949, and are based on the complete storage year July, 1947, to June 30, 1948.

Costs of Farm Storage

Including Costs of Facilities

The farmer who builds and uses grain storage space on the farm has costs relating to the building with conveyor, and to the grain.* For the most part, the costs of building and conveyor are fixed; their total remains approximately the same whether the building is used or not. The grain costs are mainly variable, or proportional to the amount of grain stored—as also are the extra transportation costs.

This study of farm storage costs was based on the use of two 1,000-bushel steel bins and a mechanical conveyor. These storage bins were used as the basis for the study because they are commonly found in Oklahoma and also because they are less expensive than most standard types of wooden structures.

The fixed costs for the two 1,000-bushel bins and conveyor were \$88.32 a year in the 1947-48 storage year. If the bins were filled to capacity, the annual cost per bushel was 4.4 cents (Table 1). The major cost items were interest on investment, and depreciation.

The variable costs of storage were 8.3 cents per bushel for the grain stored on the farm. The major item making up this cost was shrink, which farmers estimated at 2.7 percent or 5.4 cents per bushel.

Extra variable costs result mainly from the additional transportation necessary for farm stored grain. This grain, instead of being hauled directly from the field to the local elevator, is first hauled to the farm storage and later to the local elevator before it is sold. The cost of extra transportation and labor was 3.1 cents per bushel.

The total cost of farm storage of grain was 15.8 cents per bushel ($4.4 + 8.3 + 3.1 = 15.8$) when the storage space was used to the capacity of 2,000 bushels.

Oklahoma farmers, however, used just 41 percent of the capacity of their farm storage. This means, if the same percentage is applied to the 2,000-bushel capacity of the bins, that only 820 bushels would be utilized. The fixed costs would be 10.8 cents per bushel instead of the 4.4 cents with complete utilization. Consequently, the total cost of farm storage with 41 percent utilization would be 22.2 cents per bushel ($10.8 + 8.3 + 3.1 = 22.2$) as compared to 15.8 cents with complete use of capacity.

The individual farmer in making use of these average figures may wish to modify them according to costs which face him. The individual cost items are generally found in all grain production areas.

* This discussion refers to relatively permanent storage for grain. In addition, there is frequently a need for temporary storage of perhaps a few weeks when commercial facilities are not available.

Not Including Cost of Facilities

Suppose, however, that farm storage facilities may be available to the farmer without cost. For example, he may already have a granary on the farm and it will not be used if he does not put his grain in it. As the fixed costs will be borne whether or not the storage space

is used, they are not used in the cost calculation.

The total storage costs would be made up of the variable costs only, which were 11.4 cents per bushel. Even if free farm storage space were available, the annual cost per bushel of grain storage to the farmer would be 11.4 cents, on the basis of reports by farmers.

Costs of Elevator Storage

Farmers are confronted with two economic considerations when considering the cost of using elevator

storage: First, the rates they pay the elevator; and, second, the question of whether there is a differ-

TABLE I.—Summary of Farm Storage Costs and Effect on These Costs of Amount of Available Capacity Used,¹ 1947-48 Storage Year.

Item	2000 bu. stored ²		820 bu. stored ³	
	Amount of cost	Cost per bushel	Amount of cost	Cost per bushel
	Dollars	Cents	Dollars	Cents
I. Fixed Expense on Facilities and Equipment (\$1010.00 value)⁴				
a. Interest @ 4%	40.40	2.0	40.40	4.9
b. Depreciation @ 4%	40.40	2.0	40.40	4.9
c. Insurance—Buildings	3.84	.2	3.84	.5
d. Taxes	3.74	.2	3.74	.5
	<u>88.38</u>	<u>4.4</u>	<u>88.38</u>	<u>10.8</u>
II. Variable Expense Resulting From Use of Above Facilities				
a. Shrink @ 2.7%	108.00	5.4	44.28	5.4
b. Insurance on grain	27.00	1.3	11.07	1.3
c. Treating; insect control	6.80	.3	2.79	.3
d. Turning or conditioning	2.80	.1	1.15	.1
e. Cost of lower grade	4.40	.2	1.80	.2
f. Risk and inconvenience (nominal)	20.00	1.0	8.20	1.0
	<u>169.00</u>	<u>8.3</u>	<u>69.29</u>	<u>8.3</u>
III. Extra Transportation and Labor Expense on Cash Grain	<u>62.00</u>	<u>3.1</u>	<u>25.42</u>	<u>3.1</u>
Totals	<u>319.38</u>	<u>15.8</u>	<u>183.09</u>	<u>22.2</u>

¹ Two 1000-bushel steel bins was the amount of capacity available for cash grain. This amount was approximately the average amount available to all farmers surveyed.

² This was approximately the bushels of cash grain stored at all positions. The assumption made was that it was all stored in farm storage available.

³ Available farm storage used by farmers surveyed was 41 percent of available capacity—41 percent of 2000 is 820 bushels.

⁴ See discussion of facilities and equipment for information on new facility and equipment value

ence in prices between elevator-stored and farm-stored grain.

In most cases, the charges paid by farmers to store grain are the local rates, regardless of the amount of grain the local elevator stores in the terminal facilities. Local elevators may base their rates on terminal rates. However, if terminal rates are higher, competition usually makes it desirable to disregard terminal rates and absorb the difference for grain stored in terminals.

Local competition and other conditions were responsible for a considerable variation in rates charged by local elevators. Some of the elevators gave a free period of storage of 10 days or more from the date of the last load delivered. In some cases, the elevators charged a flat rate to cover storage and various handling costs — insurance, treating, turning, and loading. Others had a fixed charge per month for storage and an additional charge to cover handling costs. The majority of the elevators charged the farmers only for the days their grain was actually in storage. This is an advantage for elevator over farm storage in years when the farmer stores for a relatively short period of time.

The average storage rate for the elevators surveyed was 1.1 cents

per bushel per month, with additional miscellaneous charges directly concerned with storage operations of .7 cent per bushel. The elevators accrued their maximum charge during the first 260 days of the storage period. Consequently the average maximum charge for the year was 10.3 cents per bushel. $[(260/30 \times 1.1) + .7 = 10.3]$. The average storage period for the patrons of the elevators surveyed, however, was 172 days, with a resulting cost to the farmers of 7.0 cents per bushel for storage and handling charges $[(172/30 \times 1.1) + .7 = 7.0]$. The charges to farmers who stored for only three months were 4.0 cents per bushel instead of 10.3 cents for the full storage year $[(90/30 \times 1.1) + .7 = 4.0]$.

Information obtained from the elevators indicated that stored grain was bought for the same price as grain sold out of farm storage. The elevators' daily bid price was used regardless of where the grain was stored. Farmers storing on the farm would have the opportunity of selling at various elevators, but local competition appears to be sufficient to result in about the same bid price. Therefore, the marketability of farm farm-stored or elevator-stored grain does not appear to be an important factor in determining the difference in cost between farm and elevator storage.

Comparison of Farm and Elevator Storage Costs

Cost Differences for One Year

When the storage was used for the entire year, the cost for farm storage was 5.5 cents per bushel higher than the cost of elevator storage (15.8 — 10.3 = 5.5).

(Table 2). When, however, only 41 percent of the farm storage capacity was utilized (Oklahoma farmers used this share in 1947-48), the farm storage cost 11.9 cents per bushel more than commercial elevator storage (22.2 — 10.3 = 11.9).

TABLE II.—Comparison of Average Farm Storage Costs for 1947-48 and Elevator Charges for the 1947-48 Storage Year.*
(Cents per bushel)

Condition of Farm Storage Use	Storage Position		Difference in favor of elevator storage
	Farm	Elevator	
Annual Costs			
1. 100 percent of available capacity	15.8	10.3	+ 5.5
2. 41 percent of available capacity	22.2	10.3	+11.9
172 Days Storage (nearly 6 months)			
1. 100 percent of available capacity	15.8	7.0	+ 8.8
2. 41 percent of available capacity	22.2	7.0	+15.2
Three Months Storage			
1. 100 percent of available capacity	15.8	4.0	+ 9.8
2. 41 percent of available capacity	20.2	4.0	+16.2

* Storage year begins July 1, 1947.

Cost Differences for 172 Days

For 172 days, which was the average length of storage period in the elevators surveyed, the farm costs of storage were the same but elevator costs were less. Farm storage when used at 100 percent of capacity cost 8.8 cents per bushel more than commercial elevator storage. It cost 15.2 cents more when used at 41 percent of capacity (22.2 — 7.0 = 15.2).

Cost Differences for Three Months

For still shorter periods the differences become greater. For three

months the farm storage at 100 percent of capacity cost 9.8 cents more than elevator storage, and at 41 percent of capacity it was 16.2 cents more.

Cost Differences with Storage Facilities Provided at No Cost

If farm storage facilities were provided without cost to the farmer, as previously noted, the annual farm storage cost would have been 1.1 cents per bushel higher than commercial elevator storage (11.4 — 10.3 = 1.1). Again, for shorter storage periods the difference would have been greater.