

COSTS OF GRAIN STORAGE

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Storing grain costs money. Thus, farmers must carefully consider the advantages and disadvantages of storing grain and be clear of their reasons for carrying out this operation. Farmers must be confident that the price received at sale covers storage costs and returns a profit.

Most grain growers already have some storage, the decision they face each harvest is whether to use it or not. Storage may be used to increase flexibility, save time in silo queues, store feed or seed grain or as a marketing tool. The following example looks at a farmer who wishes to maximise marketing opportunities and store grain residue-free in a sealed silo. To do this, 6 new 80 tonne sealed silos are purchased.

The example used can be followed to work out costs for any storage type and tonnage.

The cost of storing grain can be divided into **actual costs** and **opportunity costs**. Storage costs depend heavily on the length of time for which grain is stored.

Actual costs include the costs involved in providing storage services and operating costs.

These include:

- Depreciation of the new asset over its perceived life as well as annual repairs and maintenance.
- The cost of handling equipment.
If new handling equipment is also purchased, the depreciation for it must also be included. In this example, however, we are assuming that handling equipment is already owned and used as part of the farming operation and therefore ownership costs such as depreciation and interest costs are not taken into account.
- Operating costs. These are directly related to the amount of grain handled and its time of storage. They include labour to load and unload silos, auger running costs, repairs and maintenance, insect control, selling costs and quality loss if any.

Opportunity costs.

In this example, opportunity costs are twofold. Because the farmer paid cash for the silos, the first opportunity cost is the interest rate which could have been earned on putting the cash into an alternative investment. The second, and the main opportunity cost, is the penalty for storing grain rather than selling it straight off the header at harvest. For the purposes of this example, it is assumed that a real interest rate of 12 per cent is the opportunity cost for purchasing the new silo and for holding grain in storage.

Changes in interest rates will of course influence decisions about the costs of storing grain. At high interest rates, the incentive to store grain is reduced unless there is a corresponding rise in commodity prices to offset the high interest cost.

For example, grain in storage valued at \$140 per tonne (On-farm price), could earn interest at the rate of 12% per annum. The lost earning potential would add another \$1.40 per tonne per month to the cost of storage. The longer grain is stored the greater the opportunity cost.

The following example assumes that a farmer purchases a silo for cash which is on hand and not borrowed. The figures used are only examples and will differ depending on grain prices and type, interest rates, type and price of silo and individual operating costs. However, the principles are the same for farmers doing sums for their own situations. Using a range of opportunity interest rates provides an indication of the variation in storage cost over time.

Assumptions used in the analysis:

1. Silo cost is \$7500 for a new 80 tonne sealed silo
2. Concrete slab \$1500 installed by a contractor(approximately \$19/tonne) **included in cost installed price**
3. Silo life 30 years; salvage value 5% of new value
4. The silo is filled to 80 tonne once per year
5. On-farm grain price for wheat at harvest is \$140 per tonne
6. Interest rates on long term investment capital is 12% real. (ie net of inflation)
7. Insecticide costs -
Phosphine fumigation: Only effective in a fully sealed gastight silo. Fumigate immediately the grain is placed in storage. Always treat the total volume of the storage regardless of how much grain is in the silo. The cost is 36 cents per tonne.
7. Fuel, labour, repairs and maintenance approximately \$3.00 per tonne.

Based upon the previous assumptions the costs of storing grain are as follows.

1. Annual costs

TOTAL ANNUAL COSTS = CAPITAL COSTS + DEPRECIATION + VARIABLE COSTS

Annual costs include capital and operating costs. Capital costs incorporate two main values which are interest and depreciation.

(i) Capital costs

$$\begin{aligned} \text{ACV (average capital value)} \\ &= (\text{cost installed} - \text{salvage value})/2 \end{aligned}$$

$$\text{ACV}_{\text{silos}} = (\$9000 - \$375)/2$$

$$= \mathbf{\$4312.50 \text{ per year}}$$

Therefore the annual interest (A.I.) for the silo is calculated at 12% real on the ACV.

$$\begin{aligned} \text{A.I.}_{\text{silos}} &= \$4312.50 \times (12/100) \\ &= \$517.50 \text{ per year} \\ &= \mathbf{\$6.46 \text{ per tonne per year}} \end{aligned}$$

Silo depreciation is calculated using the straight line method as follows.

New cost - salvage value depreciated over 30 years.

Purchase price = \$7500

Salvage value @ 5% of purchase price
= \$375

Depreciation over 30 years
= 7500 - 375 = \$7125

Depreciation per annum
= \$7125/30
= \$237.50

Depreciation per tonne/year
= **\$2.96 per tonne per year**

(ii) Variable costs

Repairs, maintenance, labour, and auger running costs
= **\$3.00 per tonne**

(iii) Insect control
= **36 cents per tonne**

TOTAL ANNUAL COST = \$6.46+\$2.96+\$3.00+\$0.36 = \$12.78 per tonne per year

2. Opportunity cost on grain stored

Interest foregone @ 12% real on grain @ \$140 per tonne

$$\begin{aligned} &= \$16.80 \text{ per tonne per year} \\ &= \mathbf{\$1.40 \text{ per tonne per month}} \end{aligned}$$

3. The total capital cost for six new silos per year

Capital cost equals (\$9.42 x 80) x 6 = \$4521.60 per year

4. Total grain storage cost per tonne for six months storage

TOTAL GRAIN STORAGE COST PER TONNE = ANNUAL COSTS + OPPORTUNITY COSTS.

Total grain storage cost for six months equals \$12.78 + \$8.40 = 21.18 per tonne

5.BREAKEVEN PRICE PER TONNE = PRICE PER TONNE AT HARVEST + TOTAL GRAIN STORAGE COSTS.

| Storage period | Annual cost | Opportunity cost | Total | Breakeven farmgate price |
|-----------------|-------------|------------------|---------|--------------------------|
| <i>1 month</i> | \$12.78 | \$1.40 | \$14.18 | \$154.18 |
| <i>2 months</i> | \$12.78 | \$2.80 | \$15.58 | \$155.58 |
| <i>3 months</i> | \$12.78 | \$4.20 | \$16.98 | \$156.98 |
| <i>4 months</i> | \$12.78 | \$5.60 | \$18.38 | \$158.38 |
| <i>5 months</i> | \$12.78 | \$7.00 | \$19.78 | \$159.78 |
| <i>6 months</i> | \$12.78 | \$8.40 | \$21.18 | \$161.18 |

This exercise can be repeated for different opportunity interest costs on the purchase of the silo and the storage of grain over various periods.