



Farm grain storage - what does it cost?

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Growers store grain on-farm for a variety of reasons, including:

- seed for future crops;
- feed for animals;
- buffer storage at harvest; and
- marketing opportunities.

Many growers increase their on-farm storage capacity to capitalise on marketing options.

But before investing in extra storage, the full costs need to be calculated. Then an objective choice be made between options, which include:

- storing grain on-farm;
- using 'warehousing' facilities offered by bulk handling organisations including GRAINCO (Qld) and NSW Graincorp;
- selling at the time of harvest.

The full cost of on-farm storage is easily overlooked when looking at the potential short-term returns from extra storage.

Warehousing

Central handling organisations offer warehousing facilities at rates competitive with on-farm storage costs. The bulk handler takes responsibility for grain quality management, especially insect control and insecticide residues.

Storage costs

Storage costs depend heavily
on the length of time
for which grain is stored

Physical costs

Capital-related costs and operating costs combine to make up the physical costs of storing grain.

Capital (Fixed) Costs

These costs cover the capital investment in storage and handling equipment. The capital-related costs are depreciation, interest and insurance.

Operating (Variable) Costs

These are directly related to the tonnage of grain handled or on the time for which it is stored. They include labour to load and unload, auger running cost, repairs and maintenance, insect control, and grain shrinkage losses.

Total cost of storing grain

equals

Physical costs

(fixed capital costs +
variable operating costs)

plus

Financial costs

(opportunity costs)

Financial (opportunity) costs

The financial or opportunity cost consists of the interest foregone (not received) on the value of grain held in storage rather than sold.

Opportunity cost is often single most significant cost of storing grain, especially for grain held over several months.

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Costing example*

Task: Calculate the storage cost per month (\$/tonne) for wheat kept in a 94 m³ (approximately 73 tonne) unsealed, elevated, transportable (factory-assembled) silo.

Assumptions: The installed cost of the silo with a manually controlled aeration system is \$6200; auger cost is \$4000; the silo is filled once only during each year (i.e. 73 t/yr).

A. Physical costs (annual): \$/t/year

(1) Capital (fixed) costs

Depreciation - Silo	1.48
" - Auger	0.21
Interest - Silo	3.12
" - Auger	0.29

(2) Operating (Variable) Costs

Repairs/Maintenance - Silo (1%)	0.07
" - Auger (5%)	0.22
Insect control (min. 6 months)	1.80
Auger running cost	0.08
Labour - load/unload @ \$10/hr	0.40

Total Physical Costs (\$/t/yr) 7.67

B. Financial (Opportunity) Costs: \$/t/month

Interest foregone @ 12% on grain @ \$140/tonne	1.40
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Total Opportunity Costs (\$/t/mth) 1.40

C. So, Total Grain Storage Costs (this example only) for various periods are:

1 month	$\$7.67 + \$1.40 =$	\$9.07/t
2 months	$\$7.67 + \$2.80 =$	\$10.47/t
3 months	$\$7.67 + \$4.20 =$	\$11.87/t
4 months	$\$7.67 + \$5.60 =$	\$13.27/t
5 months	$\$7.67 + \$7.00 =$	\$14.67/t
6 months	$\$7.67 + \$8.40 =$	\$16.07/t
etc.		

* Note: The above costs apply to this example only - other storages must be calculated individually.

Details on how the costs were calculated are in the "Notes" section.

Discussion

The breakdown of costs for a 6 month storage period from the example are illustrated in Figure 1. Note the very significant proportion (over half) of total costs due to the opportunity cost of interest foregone on the grain awaiting sale.

Even when stored for only three months, total costs in the example were \$11.87/tonne, with \$4.20 (35%) being interest foregone.

For short-term storage (up to 1 month), physical costs alone provide a reasonable basis for estimating and comparing the costs of storage.

Changes in interest rates are very important when evaluating the viability of long-term speculative storage of grains. At high interest rates, the incentive to store grain is reduced unless a corresponding increase in commodity price occurs.

In the example, the storage was filled only once during the year. Higher levels of use would reduce the physical costs, but not change the financial (opportunity) costs.

**Use the example in this
GRAINSAFE bulletin
to cost other
on-farm grain storage investments**

Storing grain on-farm can be a sound investment, especially as a short-term buffer around harvest when central storages may be heavily utilised. It can also improve your marketing flexibility.

On-farm storage contracts are another option that is now available. These allow the costs of storage to be offset and your estimated profit pre-determined before investing in additional storage.

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GRAIN STORAGE COSTS

(Example only - 94m³, six months storage)

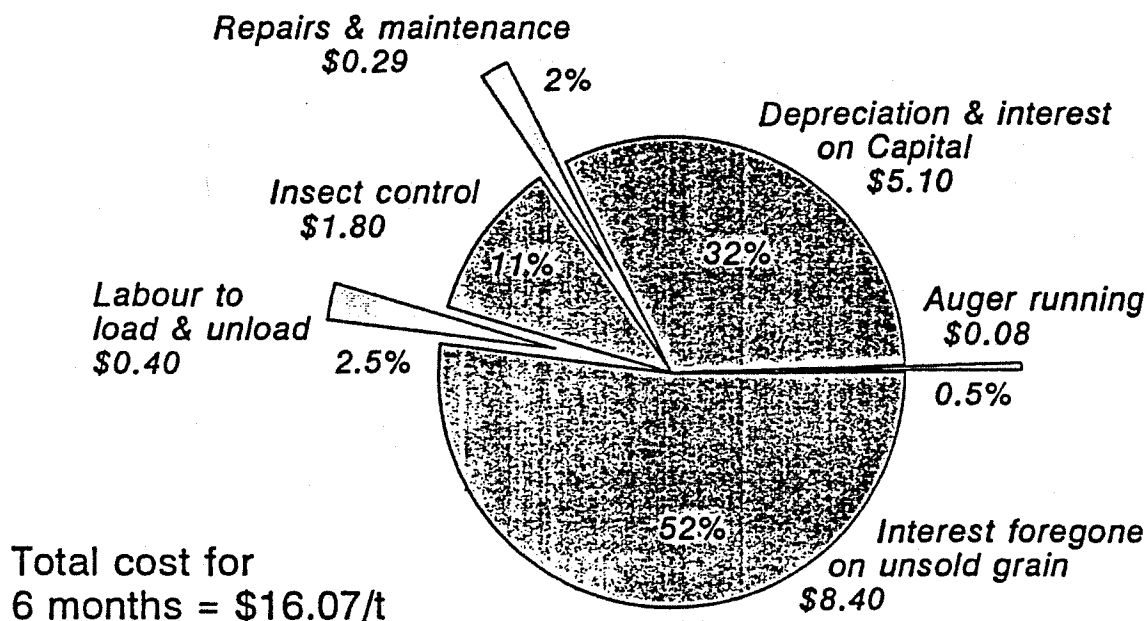


Figure 1 Breakdown of costs in example - 6 month storage period

Notes on costings

The example includes assumptions which may not apply to your situation. You will need to adjust the figures when costing your own storages.

Assumptions in the example are:

- (a) Silo life - 30 yrs; salvage value - 5% of new
- (b) Auger life - 20 yrs; salvage value - 5% of new
- (c) The silo is filled once per year - 73 t/year.
- (d) Auger throughput is 500 t/yr.
- (e) Depreciation (\$/t/yr) is calculated on the Average Capital Value (ACV)

$$ACV = (\text{Cost installed} + \text{Salvage value}) / 2$$

$$ACV_{\text{silo}} = (\$6,200 + \$310) / 2$$

$$= \$3,255$$

So, silo depreciation over 30 years

$$= \$3,255 / 30 \text{ yr}$$

$$= \$108.50/\text{year}$$

and, depreciation per tonne per year (for 73 t silo)

$$= \$108.50 / 73 \text{ t}$$

$$= \$1.48/\text{tonne/year}$$

(f) Interest on capital outlaid is calculated at 7% on the ACV - see (e). This is commonly called the 'real' rate of interest and often used for long-term investments.

For example, annual interest on silo

$$\text{Interest} = \$3,255 \times (7/100)$$

$$= \$227.85/\text{yr}$$

$$\$/\text{t/yr} = \$227.85 / 73 \text{ t}$$

$$= \$3.12/\text{t/yr}$$

(g) Annual Operating Costs:

Repairs and maintenance - 1% of new cost of silos
- 5% for augers.

Insect control - contact insecticides giving
3-6 months control.

Auger running costs - typical fuel consumption figures
for petrol engines to 15 kW.

Labour to load/unload charged at \$7/hour for auger
throughput of 60 tonnes/hour, plus 25%.

(h) Interest foregone uses typical current overdraft rate
of 12% - assumes proceeds of grain sales used to
reduce an overdraft account.

(i) Potential sale price of grain - \$140/tonne (farm gate)

