

Post-harvest management

Key points

- Maintaining quality of vetch hay and grain starts with good harvest management
- Moist and/or contaminated hay or grain will deteriorate
- Minimising handling of grain helps reduce damage

FEEDBACK

VIDEO

Storing pulses – <https://youtu.be/CeWA-OdhhSk>



12.1 Hay storage

Hay needs to be stored in dry, vermin-free conditions as moisture and vermin cause hay quality to deteriorate. There are multiple storage options and selecting the most suitable option will depend on a variety of factors (see Table 1), including costs (see Figure 1).¹

Factors influencing the choice of hay storage include:

- timeframe of storage;
- available capital;
- frequency of loading in and out;
- distance to existing storage; and
- customer requirements.

Table 1: Hay storage option pros and cons – three stars is the best option, one star the worst.

Storage factor	Top hay tarp	Full hay tarp	Steel shed 3 sides	Steel shed open sides	Hay caps
Capital cost per tonne	***	**	*	*	**
Durability	*	*	***	***	**
Annualised cost per year	**	**	**	***	***
Top layer waterproof	*	**	***	***	**
Seepage from beneath	*	***	***	***	*
Side bleaching	*	***	***	**	*
Labour required at stacking	**	*	***	***	**
OH&S during stacking	*	*	***	***	***
Freight savings from paddock	***	***	*	*	***

Note: Hay caps are only currently available for large square bales
 Source: Producing Quality Oat Hay (2016), Aexco, <http://aexco.com.au/producing-quality-oat-hay>

MORE INFORMATION

For details on stored grain, visit Stored Grain Information Hub – <http://storedgrain.com.au/>

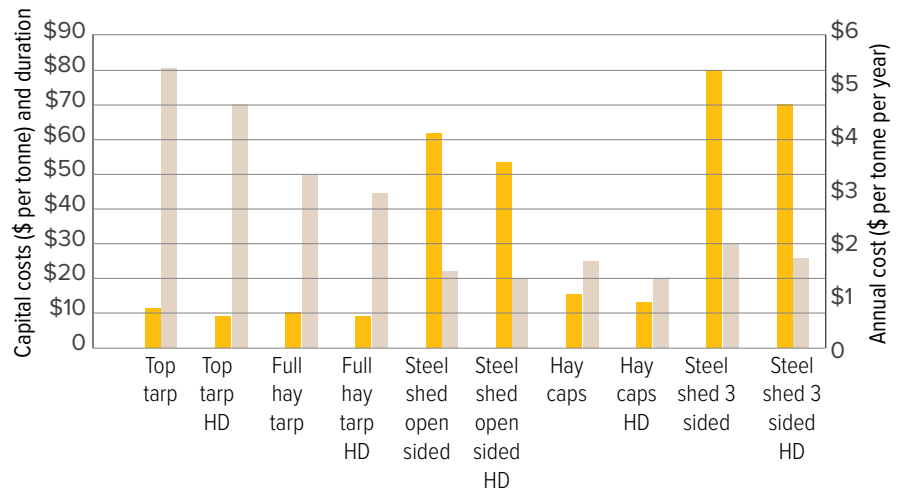
VIDEO

Storing planting seed – <https://grdc.com.au/Media-Centre/GroundCover-TV/2016/01/GCTV18/laC96M27xoM>



¹ Producing Quality Oat Hay (2016), Aexco, <http://aexco.com.au/producing-quality-oat-hay>

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Capital costs per tonne	\$10.77	\$9.33	\$9.96	\$8.63	\$61.54	\$53.33	\$15.38	\$13.33	\$80.00	\$69.33
Duration years	2	2	3	3	40	40	10	10	10	10
Annual costs t/year	5.38	4.67	3.32	2.88	1.54	1.33	1.54	1.33	2.00	1.73

Figure 1: Estimated hay storage costs for different storage options for large square bales compared to high-density square bales, which are the same size but approximately 10% heavier. Excludes labour and logistical inputs.

Source: Producing Quality Oat Hay (2016), Aexco, <http://aexco.com.au/producing-quality-oat-hay>

i MORE INFORMATION

The Grain Storage GrowNotes™ is now available. Please see: <https://grdc.com.au/grain-storage-grownotes>

12.2 Grain storage

Meticulous hygiene and aeration cooling are the first lines of defence against pest incursion. Extra costs and/or downgrading are imposed at delivery points if live insects are found in a load (see Section 11, [Table 4](#)).

Vetch grain should be stored at no more than 13% moisture, which is ideally achieved at harvest. At moisture level above 13%, aeration of stored grain will be required to prevent pockets of moist grain developing (see [Figure 2](#)). Green pods and grains increase the risk of mould developing during storage even at lower moisture content. Moisture pockets can result in moulds and grain damage as well hotspots for grain storage pests to breed (see [Table 2](#)).²

² PIRSA/GRDC (2010) Vetch: the Ute Guide. PIRSA/GRDC – <https://grdc.com.au/vetch-the-ute-guide>

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Photo 1: Vetch for grain or seed should be stored at 13% moisture or less and treated like other stored pulse crops.

Photo: Emma Leonard, AgriKnowHow

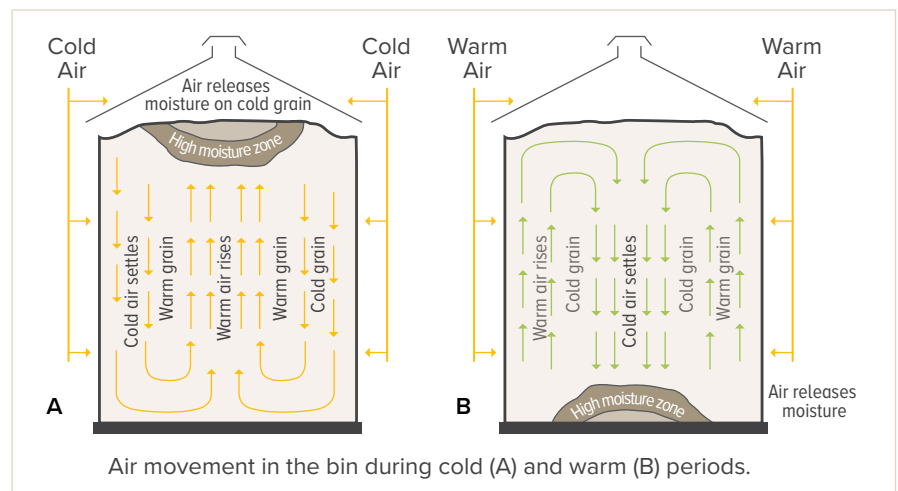


Figure 2: Influence of ambient temperature and the location of high-moisture hotspots in grain storage silos.

Source: Vetch: The Ute Guide (2010) PIRSA/GRDC – <https://grdc.com.au/vetch-the-ute-guide>

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Table 2: The influence of temperature and moisture on stored grain insect and mould development.

Grain temperature (°C)	Insect and mould development	Grain moisture content (%)
40–55	Seed damage occurs, reducing viability	
30–40	Mould and insects are prolific	More than 18
25–30	Mould and insects are active	13–18
20–25	Mould development is limited	10–13
18–20	Young insects stop developing	9
Less than 15	Most insects stop reproducing, mould stops developing	Less than 8

Source: Grain Storage pest control guide (2013) GRDC, Kondinin Group

While the number of times grain is moved should be minimised to prevent damage, transferring grain between two silos in warm, windy weather can reduce moisture content by 1–2%.

Weatherproof sheds and silos are suitable storages. Bunkers need to be waterproof. Silo bags should only be considered as short-term, temporary storage as discolouration of grain can occur, moisture can be difficult to handle, odours arise and bags can be punctured by vermin, birds or pests.

Grain stores should be cleaned and any residual grain storage pests exterminated prior to filling with fresh grain.

For post-harvest storage, vetch should be treated like pulse crops. Chemical structural treatments before storing pulses is not recommended. This is because pulses are not specified on the labels of chemicals used for structural treatments and maximum residue level in pulses for those products are either extremely low or nil.

The use of diatomaceous earth (DE) as a structural treatment is possible but wash and dry the storage and equipment before using for pulses. This will ensure the DE does not discolour the grain surface (see the GRDC’s Storing pulses, <http://storedgrain.com.au/storing-pulses>)

Fumigation is the only option available to control pests in stored pulses, and this should only be done in a gas-tight, sealable storage.

The ideal grain storage plan is to:

- dry and cool vetch grain;
- store grain in the dark; and
- sell vetch as quickly as possible.

The GRDC Stored Grain Hub (<http://storedgrain.com.au>) provides a valuable reference library of the latest information on grain storage.

12.2.1 Grain handling and cleaning

Belt shifters are recommended as vetch can be damaged by augers. Minimise handling grain to limit physical damage. Run augers full and at a slower speed than for cereals. Avoid dropping the vetch from great height on to hard surfaces.

Poor handling can lead to cracked, skinned, broken and discoloured grain which affects classification and market appeal. While visual appeal is an issue for human consumption markets, into which vetch is not sold, such defects can also reduce germination and consequently viable seed percentage.

Poor grain colour (seed or kernel) can be caused by premature ripening due to heat, drought or disease stress, harvesting immature seed ('green kernel'), delayed harvest, rain at harvest, disease, frosting or a dry, hot finish. Prolonged wet weather pre-harvest may lead to poor colour, loose seed coat or wrinkled grain, which is more prone to damage during harvest and handling.

Such defects can be minimised by:

- Controlling disease, especially *Ascochyta* blight, chocolate spot and rust.
- Managing the crop to lessen effects of frost or a dry finish.
- Crop-topping or desiccating at the right time.
- Harvesting as soon as the crop is ready, before rain and before grain moisture is too low.
- Carefully harvesting and handling grain to minimise grain damage.
- Storing in dry, sealed storage conditions.