

Storage options for chopped silage

SILAGE NOTE NO. 10

There is a wide range of storage options suitable for chopped silage. These range from relatively inexpensive buns or stacks to concrete bunkers requiring high capital investment.

Factors to be considered when deciding the most appropriate system for your farm are:

- Long-term farm goals;
- The length of time the silage will be stored;
- Location of the storage site relative to harvesting and feedout;
- Accessibility for harvest and feedout equipment;
- Available capital; and
- Compliance with safety requirements.

The storage system should be designed and managed to minimise losses of DM and quality.

Poorly designed systems can be expensive in the long term. They may be high maintenance, have high labour requirements and can be dangerous. Seek expert advice before construction to avoid these problems.

Storage options

The four most commonly used storage options for chopped silage are buns or stacks, above-ground bunkers, hillside pits and underground pits.

Portable clamps, stretchable bags, tower silos and trench silos are also used, but are uncommon and won't be covered in this note.

Hillside and underground pits are not an option in areas where soil type or a high water table rule out underground storage.

Construction cost will vary with the structure and the materials used. Expensive structures can be justified if the usage rate is high, so spreading the fixed cost per tonne of silage fed.

GOALS FOR SUCCESSFUL SILAGE

Choose a storage system that matches the farm operations and long term goals.

Locate the storage site to minimise travel during harvest and feedout.

Minimise silage DM and quality losses in storage by monitoring the stack/pit and repairing any damage to the plastic seal.



Silage buns or stacks

These are a short term option, with a storage life of up to 2–3 years. The forage is dumped onto the ground, rolled, covered with plastic, which is weighted down (usually with tyres) and edges sealed. A firm base can improve trafficability and reduce waste when feeding out during wet weather.

Advantages

- No construction costs;
- Flexibility in location, i.e. near feedout sight or in harvested paddock;
- Can be located with less regard to terrain than pits (rocky soil, subsurface water are not an issue); and
- Are adaptable for self-feeding.

Disadvantages

- High surface to volume ratio means:
- highest plastic costs per tonne of forage ensiled of the systems covered in this note;
- any surface wastage represents a large proportion of the silage; and
- Can be dangerous for operators during rolling, limiting the height of the bun.

Above-ground bunkers

These are walled structures into which chopped forage is dumped, spread and rolled for compaction. Plastic is used to achieve an airtight seal, and then weighted down. These are another short term option with a potential storage life of 2–3 years.

Concrete is usually preferred for construction of bunker walls, although various materials are used. Silage acids are corrosive and this needs to be considered when selecting material for construction.

Because above-ground bunkers are permanent or semi permanent structures that are regularly used, convenience of location is especially important. Locate bunkers to minimise travel time during harvesting and feedout. In most cases proximity to feedout is more important because it occupies more man hours, over a longer period of the year.

Advantages

- Can be reasonably inexpensive to construct—the life of the structure is usually proportional to the construction cost;
- Lower plastic costs per tonne of silage made compared to buns;
- Relatively easy and safer to roll than buns;
- A solid base enables all-weather access; and
- Depending on construction can be expanded relatively inexpensively using a common wall.

Disadvantages

- High cost structures must have high usage rates to spread overhead costs; and
- Earthen floors can make wet-weather access difficult, particularly if the design has not allowed sufficient floor slope for drainage.

Hillside pits

Suitable for either short, medium or long term storage hillside pits are a suitable option for undulating country. The body of the pit is dug out of the hillside, with the excavated soil used to build up the walls of the pit and/or to cover the plastic.

For medium and long term storage a layer of non-porous soil, at least 30cm deep, will protect the plastic and prolong storage life indefinitely.

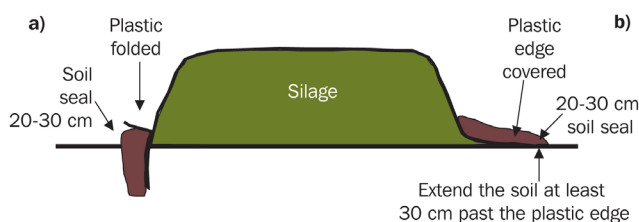
Advantages

- Construction cost is usually low;
- Relatively easy and safer to achieve good compaction during rolling than for buns or bunkers; and
- Reduced plastic costs per tonne of ensiled forage compared to buns or stacks.

Disadvantages

- May have high maintenance requirement and safety concerns if the walls are unstable; and
- Poor design with insufficient floor slope can reduce accessibility in wet weather. A solid base will improve accessibility.

Figure 1 The cross-section of the bun shows two options for sealing the edge of the plastic



Source: Top Fodder, *Successful silage*. 2004. page 232
dpi.nsw.gov.au/__data/assets/pdf_file/0005/294053/successful-silage-topfodder.pdf

Options (b) can be unreliable if there is insufficient soil depth or if porous soil is used. The soil must overlap the edge of the plastic.

Underground pits

These pits are dug into the ground, with the removed soil being used to cover and mound over the pit to shed water. They are the most commonly used as long term or drought storages but are only recommended for drier areas.

Advantages

- Relatively inexpensive to construct; and
- Ideal for long term storage.

Disadvantages

- Not recommended for short term storages;
- Not suitable for areas with a high water table;
- Pit should not be used during wet weather; and
- Potential safety risks if pits are deep and/or walls are unstable.

Minimise storage losses from chopped silage:

Select a suitable location to avoid e.g. water infiltration, overhead trees.

- Harvest forage in the target DM range to avoid effluent losses and to achieve good compaction (see Silage Note 4).
- Compact the stack effectively during filling to expel air.
- Effectively seal the stack immediately harvest is completed; for large stacks seal within three days of harvest commencing.
- Use plastic designed for silage-making and recommended for Australian conditions.
- If the silage is to be stored for longer than 2-3 years the silage plastic must be protected from sunlight with a 30-50 cm layer of non-porous soil.
- Monitor the storage regularly for damage to the airtight seal (e.g. torn plastic, animal burrows).

(Note: Builders' grade plastic is not recommended for ensiling, unless the plastic is then covered by a layer of at least 30cm of non-porous soil. Builders' plastic is not airtight and will become brittle and deteriorate very quickly if exposed to sunlight).

FOR FURTHER INFORMATION

The information in this silage note is taken from the Successful Silage manual.

This Silage Note is No. 10 in a series prepared as part of TopFodder Silage a joint initiative of Dairy Australia and NSW Department of Primary Industries, which aims to improve the quality of silage produced on Australian farms.

For comprehensive information ask about:

- Successful Silage - a technical manual (including the TopFodder Silage DVD).
- TopFodder short courses in your area.