

Advice on clamping sugar beet to ensure optimal harvest storage

**Written by Dr Simon Bowen
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This year's sugar beet harvest campaign is now underway, but the current shortage of HGV drivers is expected to limit crop collection times which may force some beet growers to store crops on farm.

With average sugar beet clamp loss rates at 0.1% of total sugar volume/day, finding the optimal storage technique is fundamental to minimise these losses.



Beet stored in poorly managed clamps can severely reduce crop quality, leading to financial penalties and even crop rejections.

We look at the latest advice on how to construct and manage sugar beet clamps to ensure growers get the best price for their crop.



Contractor communication

Simon Bowen, head of knowledge exchange at the British Beet Research Organisation (BBRO) firstly advises growers to have good dialogue with their contractors so they are aware of the current haulage situation and can manage it accordingly.

“The best advice is always to work with contractors and hauliers and go for just-in-time delivery if possible. Where storage is required, minimise the length of time crops are stored, as the longer the

storage the greater the sugar loss- particularly earlier in the season when temperatures are high,” says Dr Bowen.

Ask yourself do I need to lift? Or should I leave it in the ground? Once crops are harvested, they become a ticking clock for sugar loss.

“This season’s crops are looking full of potential, so they are probably best left in the ground for the next month. As long as crops are healthy, they are actively growing and contributing to yield while left in the ground. There is no point harvesting beet, if they’re just going in to store which risks sugar loss,” he continues.

Currently soil temperatures are still relatively warm at 12-15°C which makes sugar loss three times greater when compared to harvesting when soil temperatures are 5°C.

Growers should also only aim to store crops when temperatures have decreased, usually lifted from the middle of October onwards.

If lifting in warm conditions, it's best to harvest in the evening when temperatures are cooler as sugar beet management becomes easier as soil temperature decreases.

Growers should assess the disease risk of crops, with those suffering from virus yellows or foliar disease taking priority when it comes to harvest and being lifted and taken to the factory sooner rather than later as these crops are not suitable for storage.

Successful storage

The key to successful beet storage is driven by a successful harvest. Stored beet will inevitably result in sugar loss, but the rate and severity depend on how beet is harvested and handled.

Sugar beet crops store best where harvest damage is minimal, so quality therefore depends on:

- Excessive dirt – Avoid lifting soil during harvest as this reduces ventilation in the clamp by limiting airflow between the beet. Although some dirt can help “cushion” beet during loading
- Excessive green material – Similar to too much dirt, too much green matter can limit air flow in the clamp, which is why lifting beet with care and having good communication with the beet harvester is important

Damaged beet- Minimise the amount of root breakage as sugar loss is three to four times higher in damaged crops compared to un-damaged crops. Machines should be set-up correctly to ensure crops are not handled too aggressively

- Scalping- Don't over-top the sugar beet crop by removing too much of the crown, otherwise this can accelerate sugar loss and lead to rotting, mould development or bacterial infection.
- Root rots - Avoid storing contaminated beet crops which contain fungal rots such as Fusarium, Rhizoctonia and Phoma as this will inevitably raise the clamp temperature, leading

to greater respiration rates and increased sugar loss. Any parts of a field which are infected by rots should be managed separately and not mixed in the main clamp.

Clamp construction

Where it is necessary to store beet on farm, Dr Bowen suggests that clamps should be built in an open area to aid ventilation and cooling.

Avoid siting clamps against the side of buildings or other areas which can restrict ventilation and select a site at least 10m away from overhead powerlines.

The site should have a firm, well-drained base that is suitable for loading and unloading, with no ruts which can trap water or loose beet, leading to hotspots and high respiration rates.

Dr Bowen emphasises that sugar beet should not be pushed up the face of the clamp. "This will otherwise damage beet, compact the clamp and restrict air movement, allowing heat to build-up which increases the rate of sugar loss," he says.

Clamp type

Depending on the length of time beet is required to be stored for, impacts the different types of clamps which should be constructed. Dr Bowen talks us through the three main types.

Early season/temporary clamp-

Beet lifted early in the season which require temporary storage should not be left in the clamp ideally for more 10-14 days. Such clamps should be made up of individual loads where trailers carefully tip beet into the clamp.

These short-term clamps should not exceed 2m in height, be covered or have retaining walls. They are designed to provide a large surface area which reduces sugar loss through respiration.



Late season/longer term clamp-

Late season long-term clamps are used later into the sugar beet campaign when longer storage is required.

Clamps should be no more than 2.5m high and constructed using pallets and bales. Pallets should be placed on a concrete pad to aid ventilation while bales should be placed on pallets with the open-end facing outward to aid ventilation.

The beet pile should be loaded carefully with a level surface, so no frost pockets develop when temperature dip below freezing.

Hollows between trailer heaps should be filled by tipping loads into gaps with a loader- not pushing up the face.

Clamp sheets should only be used if the ground temperature is below -3°C. These sheets are made from polyfelt which still also allow the sugar beet to breathe.

Longer term storage isn't frequently used in the UK.



A-shaped/Maus clamps

An A-shape clamp should be built, where a self-propelled cleaner loader is used. The beet must be placed on a flat un-rutted surface in an 'A' shape of the correct width to allow the machine to operate effectively.

Clamps can be higher than 2.5m, but height is determined by the width of the loader and angle of repose.

These clamps are normally built on the headland, ideally loaded with a harvester or chaser trailer directly, rather than a conventional tipping trailer which runs to the heap.

This will avoid creating ruts in the clamp which would otherwise fill with beet and water, that could lead to rot problems.