

STORAGE OF WILTED SILAGE IN STACKS

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Stacks include pits, clamps, bunkers, bun stacks, and single and double wedges.

AIR IS THE GREATEST ENEMY OF WILTED SILAGE

DURING ENSILING – Air must be excluded as much as possible

- The shorter the chop, the greater the compaction and exclusion of air.
- Aim for a dry matter percentage of 30-35%
 - Fewer than 25% will result in more silage effluent and poorer quality silage.
 - At 40%, silage needs to be precision chopped, well rolled and extremely well (and quickly) sealed.
- Roll with a heavy wheeled tractor in preference to low centre of gravity tracked vehicles, eg dozer
- Evenly spread the loads to a thickness less than 0.5m – tractor wheels will have no compressing effect below this depth.
- Preferable to have safety rails along the tops of moveable clamps and bunkers to avoid tractor wheels accidentally driving over the stack edge.
- If practical, the stack should be covered with plastic after each day of harvesting and lightly weighted with tyres, etc., especially around the edges. This minimises air penetration overnight.
- If the stack feels hot or steam is rising the following morning, the stack has not been sufficiently rolled. This heat is the energy (carbohydrates) that you are trying to store for the animals.
- Slope of floor should be about 1:50 and solid, preferably cement.
- Stacks should be long, deep (approx. 2m – 3m) and narrow, but greater than 4m to allow complete tractor compaction across the entire stack.

AFTER ENSILING – The stack must be immediately sealed completely airtight

- Continue to roll the stack until there is little impression left by the wheels.
- Seal the stack with 160-micron thick polythene plastic designed specifically for silage.
- Overlap any joins by 0.5 – 0.8m and, either seal these with proper poly adhesive tape, or lay tyres or sandbags along the joins. The plastic must be dry and clean for the tape to work effectively.
- Plastic edges must be completely buried around all sides of the stack. Excess plastic may be folded over before covering with dirt and left poking out of the soil. This allows easier and quicker uncovering of the stack when feeding out (see diagram 1).
- Alternatively, if leaving plastic on top of the ground, cover the edge with sufficient dirt from stack side to well past the plastic edge (see diagram 1).
- Weight the plastic down with tyres so that they are touching each other. Alternatively cover the plastic with a thin layer of soil (50-60mm deep) and sow with grass seed. This enables you to uncover the plastic quickly and cleanly.
- For long term storage, cover the stack with a minimum depth of 300mm of soil with or without plastic.
- Lime is not suitable as a seal. The amount needed to adequately seal the stack would be expensive. There is also a possible danger for animals ingesting excessive amounts of lime.
- Several hectares of pasture or weedy areas may be green chopped and rolled till such time as a crust is formed to act as a seal.

- However, plastic costs under \$1.00/sq.m. Each square metre saves about 50kg of silage which, when fed, will produce about 1kg butterfat @ \$5.00/kg B.F. therefore \$1.00 cost makes you \$4.00.
- If handled carefully, the plastic may last for 2-3 years.
- Uncovered stacks lose: 30% to 60% dry matter.
- Sealed stacks lose: 15% to 25% dry matter.
- A certain sized stack was measured to have used up all of the trapped air within 5 hours if immediately sealed. It required 90 hours when left unsealed for 48 hours, ie. A HIGH LOSS OF NUTRIENTS AND ENERGY.
- Movable clamps and cement bunkers may be sealed satisfactorily as per diagram 2.

DURING STORAGE – Any holes must be immediately sealed.

- Small holes can lead to substantial losses if not sealed with a proper plastic adhesive tape (plastic must be clean and dry).
- Holes may be caused by cattle, foxes, rabbits, rodents, etc.
- Fence off the area securely. Single wire electric fencing is often unreliable.
- The longer the chop, the drier the silage, the warmer the temperature, the longer the hole is left open, increasingly greater is the air penetration and therefore the rate of silage deterioration.
- Old plastic sheets cut up, filled with dirt or sand, and tied into a sausage, make excellent sandbags for sealing difficult to seal situation, eg. ½ filled bunker.
- Bun stacks, apart from being externally dangerous to build, are expensive to seal and have a large surface air to volume. Generally they have substantial losses around the edges because of the amount of air trapped per volume of silage.

FEEDING OUT – Air penetration of the feeding face must be minimised.

- Remove a minimum of 100-150mm depth from the stack each day or 300-450mm every 3 days.
- After each load is removed, it is preferable to pull the plastic back down if practical, but certainly needs to be done if feeding out is interrupted for an extended period.
- Use a block cutter or a silage grab in such a way as to minimise disturbance of the silage face. This reduces air penetration further back into the stack.
- If self-feeding, losses may be quite high – a solid base is needed if feeding out in the late autumn/winter period. A moveable barrage will minimise silage wastage.
- Allow 5-6 animals per metre of feeding face if on 24hr access but reduce to 2-3 animals per metre if on limited access.

A GUIDE TO THE LIKELY CAUSES OF SPOILAGE LOSSES

PROBLEM	LIKELY CAUSE	SOLUTION
1. Top waste or crust	inadequate sealing. Final rolling insufficient	Apply a sealer to concrete wall, or use plastic sheeting on walls of stack. Use sand bags to give seal between wall and plastic.
2. Side waste	Porous walls. Inadequate seal between plastic and wall.	Apply a sealer to concrete walls or use plastic sheeting on walls of stack. Use sand-bags to seal between wall and plastic.
3. Shoulder waster	Lack of consolidation and effective sealing of shoulders	Improve consolidation and sealing technique. Plastic sheeting folded over from the side walls will assist.
4. Top waste and mouldy pockets	Inadequate consolidation of over-wilted or mature material resulting in trapped air.	Improved consolidation, seal immediately and weigh down sheet. Avoid over-wilting. Top off stack with loads of moist or direct cut material. Spread loads evenly over area.
5. (a) Poor quality layers of dark brown unpalatable silage. (b) Rotten pockets	Frequent stops, lack of rolling and covering. During extended stops. Too wet. Contamination by soil	If major delay occurs seal off stack as a separate batch. Wilt Longer. Avoid soil contamination.
6. Butyric and foul Smelling bottom layer.	(a) Crop too wet (b) Poor drainage from stack.	(a) Wilt, avoid excessive rain. (b) Improve drainage from stack.