Smelly silage and neighbours

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"What the hell is that smell?", "I wish that farmer built his silage stack at the other end of his farm instead of next to our house", "I live out here to get clean, fresh air and I cop this horrible stink from my neighbour's silage."

These are typical of comments from some folk living near farms on the boundaries of cities or towns. Many neighbouring farmers have been taken to task for their silage emitting 'horrible' and this can lead to tense relationships. Farmer organisations have tried to support farmers arguing that farmers do have a "right to farm".

Unfortunately, even silages which have been well made and stored in well-managed sites and produce what most farmers may think is a typical sweet, pleasant smell but is unpleasant and foul smelling to many non-farmers. Poorly made silage do stink and do emit unpleasant odours.

So the question is, what can farmers (and contractors) do to mitigate the problem of smelly silage?

Well-made silage will theoretically undergo a very good fermentation if stored in virtually airtight conditions. Unfortunately, this does not occur as often as it should.

No smells escape from airtight silage until it is fed out and once fed, it should be a reasonably sweet and, dare I say, a pleasant odour to the nose. If people escaping the poisonous stench of city traffic and factory smells can't accept this favourable odour, they might need to toughen up a little!

Unfortunately, many silages are poorly made and/or poorly managed during storage and feeding out resulting in offending odours. Even many farmers would agree that these can be sources of horrible stinking odours.

Smelly silage is often caused by poorly harvested silages and generally from forage which has been harvested too wet, been severely rain-affected, may contain mud when made in wet conditions and consequently undergoes a poor fermentation. This causes stinking and highly polluting effluent to seep from the stack and production of smelly gases from both the stack and effluent. Usually this effluent s,eeps into the surrounding soil/mud and, at feed out, is admirably mixed with tractor and silage cart wheels to become well entrenched and a constant slow-releasing source of the offending stink.

To avoid this source of stink, either ensile the forage at the recommended dry matter (DM) content levels or use an appropriate silage additive to increase the chance of a desirable lactic acid fermentation to produce the sweet, smelling silage. Recommended DM contents are 30 – 35 per cent for longer chopped forage harvested silage, 30 – 40 per cent for precision chopped (short chop) silage or 40 – 50 per cent for round-baled silage, and up to approximately 60 per cent for large square-baled silage.

Appropriate silage additives have been found to enhance the fermentation in forages which are below the targeted DM contents.

These include mainly buffered acids and specific bacterial inoculants. Other products are available, so it is advised to consult a range of suppliers when deciding on the right product for you. Be aware that their recommended application rates will need to be increased as they are usually based on a fresh tonne basis and material which is even slightly too wet contains a lot of extra weight!

Sometimes severely rain-affected material may not contain enough remaining sugars in the forage needed for inoculants to produce enough lactic acid to create well-fermented silage.

Another less common source of stinking silage odour is caused by soil-borne clostridial bacteria being incorporated with the fresh material. This can result in a poor or improper fermentation. Contamination may come from a proportion of the high sections of pug marks in pugged paddocks being "mowed" at cutting or from manure inclusion when equipment tines (rake, tedder or baler) are set too low. It can also happen when mud at the silage stack area is carried onto the stack (Figure 1) via wheels during delivery and compaction.

These sources, although maybe not always avoidable, could be reduced substantially by setting equipment higher and choosing more suitable paddocks to harvest. Problems at the storage site could be minimised by installing a solid base such as sand or rock leading to the stack entrance and a concrete apron at the dump area in front of the stack unless silage is dropped on the stack itself. Concrete bases in the stack itself will avoid the foul-smelling mud/silage mix when loading up and feeding out.

During storage the plastic seal should be sealed airtight for the entire storage period and maintained as an airtight seal. If not, the silage will star5t to deteriorate throughout the outer sections of the stack or bale, leading to lost silage DM, quality and production of smelly gases.

Air tight in a stack means the prevention of air entering the perimeter of the stack plastic, ideally with a small amount of soil covering the edge of the plastic to stop air entry.

'Sausages' made from last season's plastic (Figure 2) or commercially produced (Figure 3) and laid in an inter-lapping double row on the plastic perimeter provide a lesser seal but are much better than one or two tyre widths, laying on the plastic at the stack base.

The traditional white on black polyethylene film has served silage storages well over many years but new plastic formulations which are twenty times more impermeable to oxygen, have become available over recent years. These come in either a two-step or one-step system.

The two-step system includes a clear, now orange coloured, 45 μm (micron) thick polyamide film, which acts as the "Oxygen barrier" but is not ultra-violet (UV) light treated. This film requires an UV light inhibitor treated tarp, or white on black sheet to protect the non UV-treated clear film underneath.

The One step system is a 125 μm thick black on white UV-treated coextruded polyethylene-polyamide plastic sheet with the oxygen barrier technology integrated into the film.

Several other clear non-UV treated "OB" barrier films are now on the market with less OB effectiveness and still require a UV-treated cover but are effective as long as the perimeter is as airtight as possible.

For round and square bales, airtight involves at least four layers of stretchwrap film with no underlapping and 55 or 70 per cent stretch depending on plastic type. Six layer would provide an even

better seal, especially for stalky plants, if transported and could provide up to two years safe storage if not holed. Some companies recommend the six layers for their specific stretchwrap film.

Recently, a new stretchwrap film containing the OB technology has been developed and whilst expensive at this stage, allows no gases to escape and negligible to enter and reduces losses in quality and dry matter due to substantially less oxygen getting into the bale.

Unfortunately, well compacted and sealed stacks bales can still get holes in the film and deteriorate, producing offending odours.

Sometimes just a decent fence or one with a reliable kick can reduce some causes of plastic damage. Regular checking of stacks and bales and immediate sealing of the holes will minimise silage loss and stink production. To get a patch to last, the area to be sealed must be clean and cool.

Use light colour patching tape on light colour plastic and make sure it is specific silage tape not duct tape. It is also important to apply the tape flat with no ripples through which air can enter.

When feeding out ensure any deteriorated silage is removed from the stack top or edges and dumped in an area with a relatively hard base. Very often it is this waste silage which continues to further rot or worse still, is pushed into mud in the silage base or loading area by loading tractors causing odours.

It is important to design the bunkers and pits so that the silage face matches your feeding out rate. This will avoid waste or deteriorating silage from a silage face that is too wide. Silage removal equipment should leave a tight even face to minimise air penetration and subsequent aerobic deterioration.

Although not always possible or practical, a major opportunity to maintain good neighbourly relations is to locate silage storages well away from their homes and/or down wind of the main wind direction. Making silage well, maintaining an airtight seal and keeping silage waste and mud separate at the silage storage site will go a long way to keeping neighbours happier, in most cases.

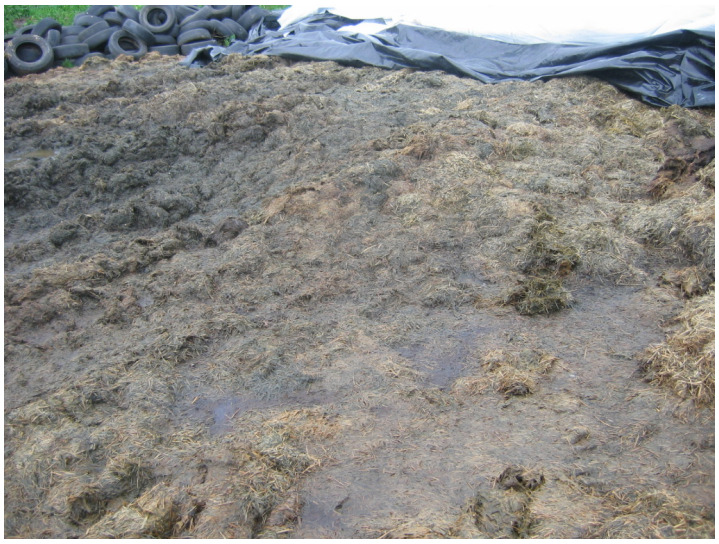

Figure 1. Mud being carted onto silage stack

Figure 2. Sausage filled with gravel, made from waste plastic sheet

Figure 3. Silostop bags filled with pea gravel and overlapped for better seal