Department of Environment and Primary Industries

Haylage? Be careful!

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"Haylage" has been on the increase for several years since large rectangular baled silage became an alternative option to the tried and tested round baled silage. Consequently, due to its higher dry matter (i.e. lower moisture) content and shape for efficient transport, Haylage has been recognized as a saleable commodity over the last few years.

However, there are some traps for unwary buyers, for farmers storing Haylage on farm and also for some farmers and contractors starting to push the envelope past proven boundaries. This article hopes to address some of these traps.

Background

Australia was the first country to research and develop wrapped round baled silage which showed that the 40 – 50% DM range to be the best dry matter content at which to bale round baled silage with the balers available at that time. If baled below the recommended range, bales often undergo a poorer fermentation; lose both quality and excess DM and lower palatability. However, if baled too much above the range, the risk of bales becoming mouldy substantially increases.

Then the large square balers arrived, producing tighter bales than the rounds, so much less air was entrapped in the bales at storage so less chance of mould developing in these bales. This enables the anaerobic fermentation process to begin sooner, and theoretically, should result in slightly less nutrient and DM losses than round bales.

However, contractors and farmers soon started to push the baling DM content levels above the 40 – 50% DM round bale silage range, the upper limit sneaking up to 60 to 65% DM, and heaven forbid, even higher in some cases!

Why has the DM range shifted upwards for large squares? The answer, in earlier years, was very often that the drier bales were easier on the baler, despite most European balers being designed to handle square bales as low as 30 – 35% DM. Then some farmers and contractors who individually wrapped their large squares soon after baling, often succeeded in producing successful large square baled silage after undergoing minimal fermentation, often with nil or minimum mould growth.

As per usual, the word spreads and the DM content range of about 45 – 65% DM seems to have become the norm and is now often referred to as Haylage, i.e. somewhere between silage and hay (14 – 18% moisture, i.e. 86 – 82% DM!). However, the upper end of this range is approaching a danger zone where the material is too dry for the bacteria to work efficiently, if at all, but too wet for hay. The risk is mouldy silage or heat damaged hay?

However, those of you who are web savvy and surf the net in the USA may become confused as Haylage, also referred to as Baleage, is actually round bale silage baled at 40 – 50% per cent dry matter (% DM). However Haylage in the USA is also material ranging from 40 to 60% DM in some states but 50 – 65% DM in other states. To add more confusion, Haylage is usually baled silage but can be also very high DM chopped silage in the states.

In the Australian context I like to see Haylage baled in the 45 – 60% DM range as the material will still be moist enough to ferment and so ensile and is backed up by the experience of many experienced operators.

Some traps for the unwary

Wrapped vs Modular stacks. Large square baled silage (LSBS) can often be successfully ensiled up to about 60% DM, maybe slightly higher BUT only if baled very tightly and individually (Figure 1) or continuous in-line or sausage (Figure 2) wrapped very well and soon after baling. However, if extremely high DM bales are stored in small stacks, i.e. modules under sheets of plastic, the chances are very high that they will be mouldy upon opening or the stack will become mouldy and heat soon after opening.

Figure 1. Individually wrapped large square baled silage

Figure 2. Large square bales Continuous-in-line wrapped

To ensure the greatest chance of success with modules, the bottom edges of the plastic must be sealed airtight (preferably with soil/sand containing clay) and some form of weighting on top of the module to stop plastic flapping when windy (Figure 3). If not, the plastic will eventually crack and it needs only a very small hole/crack to allow the entire module to become filled with air and eventually mould growth and silage deterioration. These cracks are rarely noticed and/or never patched so air continues to enter the module. Think of Air in - $$$$ lost!

Figure 3. Well sealed and reasonably well weighted module

Consider using **"aerobic spoilage inhibitor" type silage additives** to delay mould growth and heating upon opening the modules at feed out. They require about 50 – 60 days to produce the acetic acids which slows down yeast growth, a precursor to aerobic bacteria growth and then mould growth. Therefore these additives will not be useful if the storage has ongoing slow leaks either from poor sealing and/or if the plastic seal is holed! Be aware, these are not the general run-of-the-mill "fermentation enhancing" silage additives of which the majority are bacterial inoculants. Both types are applied at harvesting.

Large squares can also be stored in the ground (Figure 4) as long as they are packed in tightly, sealed airtight and water prevented from entering the storage area from the surface or through the soil itself. It is recommended to separate the stack into several compartments by positioning a plastic sheet between compartments. This will prevent air seeping to the rear of the stack via gaps, holes in plastic and if bales are over dry.

Figure 4. Large square baled silage packed tightly into a pit

LSBS is also suited to being a drought storage for farmers who do not have bulk silage feed out equipment. Placing ~0.5+ m soil on top of the plastic (Figure 5) will ensure the stack is completely airtight and water proof for many years, if necessary.

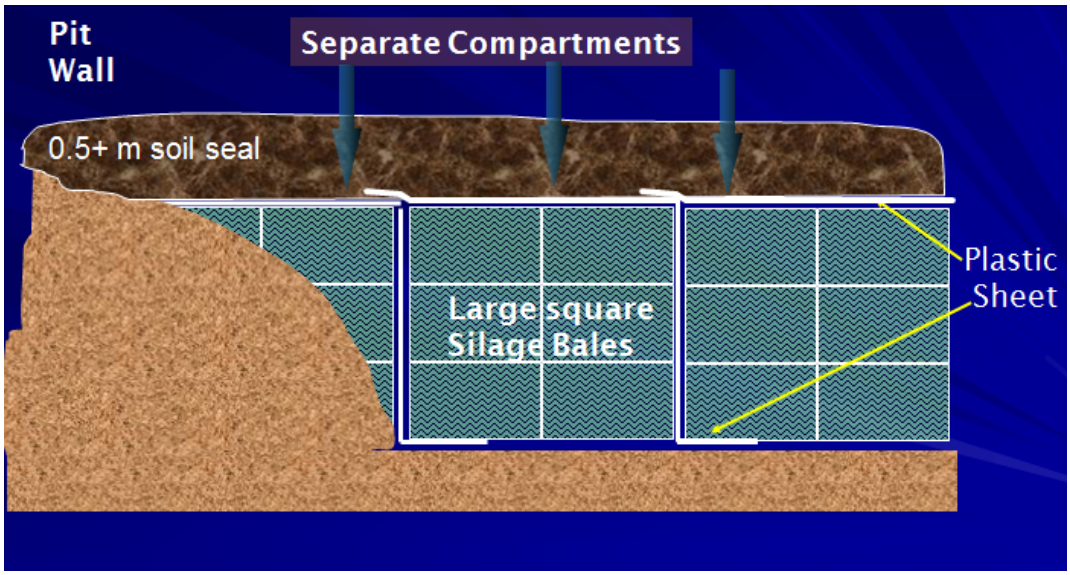

Figure 5. Cross section of pit: LSBS in compartments, sealed for drought storage

Greater risk of rain. An issue in some regions aiming for the high DM large squares bales could be the arrival of rain or extended (greater than 2 – 3 days) wilting period before the DM target is reached. Think rain or extended wilting period - $$$$ lost.

Too dry at baling. If baling DM is 60 – 70% DM due to, large areas to be baled and/or the weather turns hot, mechanical breakdowns, contractor arrives late, etc. will result in DM being 65 – 75% DM, definitely in the danger zone and nutrient loss in the form of dust! Any dust seen when raking and baling high DM large squares will be most likely highly nutritious leaf material resulting in DM and quality loss. Think dust or too dry - $$$$ lost.

Delayed transporting and/or sealing. As mentioned earlier, unwrapped Haylage bales are now being hauled many kilometers after baling and then sealed on farm. Bales should be on the truck as soon as possible after baling, ideally within the hour, and then sealed within an hour or so at the destination. Despite large square bales being relatively airtight compared to round bales, air will still be in contact with the outer edges and will lead to slight breakdown of the forage into carbon dioxide + heat + water. Not a large issue if sealed airtight very soon after arrival.

As the outer areas exposed to air breakdown, this then allows more air to move further into the bale/stack to continue the process. If bales are felt to be warm or heaven forbid hot, with maybe mould starting to appear, then losses will occur deeper into the bales over time. Think heat and/or mould - $$$$ lost.