

Managing baled hay around rain events

Frank Mickan
Pasture and Fodder Conservation Specialist,
DEDJTR, Ellinbank Centre

Rain fall and inclement weather can be a nightmare for many areas of Australia during the hay making period, affecting either mown or baled crops. Although on many occasions nothing can be done to avoid the situation, there are some techniques, albeit labourious ones, which can be very effective in reducing the amount of moisture soaking into your precious hay. If you do end up with rain on your square bales, or is likely to occur before you are able to get them into a hayshed, the following suggestions may be of use to you.

Rain is forecast but you won't be able to get freshly baled hay shedded before it arrives. Small square bales, although not applicable to many farmers these days, could be stacked into triangular stooks, using two techniques. Firstly, stand the bales on their ends in groups of four so that they resemble an inverted 'V' shape (See Figure 1). Place another bale on its edge in the 'V' to help shed the rain. The uncut side of the bales should be facing up since it tends to shed the water more effectively.

An alternative is to stand two bales on their ends into an inverted 'V' and then lean two more also on their ends at right angles to the other two so that the group resemble an "Indian Teepee." This will shed much rain but may tend to keep the top inner edged moister as the rain will run into the centre of the "Indian Teepee" where the bales touch at top.

Another technique is to stook bales horizontally (See Figure 2). The first two bales are laid on their edge and leant against each other so that they touch only on their top corners. A third bale is then laid on top in the 'V' shaped area formed by the first two bales, the uncut side facing upwards. These techniques usually require at least two people to make the job easier and faster.



Figure 1. Small bales stood on their ends



Figure 2. Bales stacked on their edges

Stacking large square bales to shed rain is not an easy job but well worth the effort. Use whatever piece of equipment will do the job to stand the bales on their ends. Be careful not to cut or weaken the strings if using something like a front end loader bucket. This will shed most rain (Figure 3) and the bales will dry much quicker once the rain has passed.



Figure 3. Large bales stood on their ends

Another alternative can be to stack large square in whatever size stack is practical and safe around the paddock(s). Stacks can vary from groups two to three bales high to small stack sizes. For some of the stacks which may be of reasonable size, if time and tarps or plastic were available, could be used as temporary covers but need to be well tied/weighted. At least some of the hay will be protected from the rain entering the stack tops, bale surfaces and between the bales themselves.

If unprotected stacks of bales receive very heavy rainfalls, as often has occurred over recent years, a lot of moisture soaks down between the bales and has led to spontaneous combustion, i.e. haystack fires.

Remember the protective sheet should be a temporary fix only as the bales, if stacked within hours or even days after baling, will still generally need to continue to cure, and even more so if baled slightly on the wet side. Even hay baled at the correct moisture content will still cure down to the reach an equilibrium moisture content of about 15 per cent moisture. The moisture given off in this process is what causes the ‘sweating’ of hay. Once confident the rain has passed, remove the cover to allow this moisture to evaporate off and prevent it building up under the sheet.

Although the outer edges of the stack will become wet, their internals should remain relatively dry, unless the rainfall event is gentle and persistent. A heavy downpour is far less damaging than a long, continual drizzle. If only a light shower is expected (and who knows?) then the increased density of the large squares will prevent excessive water ingress and it may be possible to leave them where they lie.

Round bales, if tightly baled and net-wrapped, will shed much of the rain. USA Wisconsin research has measured dry matter losses of 11.3 per cent with string tied bales compared to 7.3 per cent for net-wrapped bales. Bales made early in the season will have a high digestibility due to their leafiness and high content of sugars and, if rained on, dry matter and quality losses can be severe. They should be shedded as soon as possible or stacked and covered with plastic to prevent large losses. Over 50 per cent of the weight of a two metres diameter round bale of hay is in the outer 30 cm so anything to reduce wastage of round bale hay stored outside will be very beneficial. Stacking them tightly end to end will protect the vulnerable flat ends of the bales.

What to do after the rain with hay bales that have become wet?

When the rain finally clears, pull the square bales stack apart to allow the outside bales to start drying. After ensuring the internal bales are completely dry stack them into the shed.

Spontaneous combustion can sometimes occur from only a small section of one bale containing too much moisture. Depending on where they are wet, bales may need to be flipped over for a few hours drying before shedding. This may be easier said than done in a wet season!

If unsure as to whether the bales are safe to be shedded after rain, should be stacked to allow air movement through, around and over the top of the stack. These bales will sweat and heat and encouraging air circulation will allow the heat and moist air to escape. Alternatively, if shed space permits, or an empty equipment shed is available, stack the wettest bales over the largest area possible, placing the driest bales in the hay shed. If you do not have sufficient area under cover to spread them out, and if you feel you must stack them in the shed, try to put something, such as two 4 x 2's between each layer of bales to allow heat to escape.

If the weather turns hot, leave the wetter bales outside to dry out but if the weather looks like turning nasty again, and you don't have spare shed space to spread out the very wet bales, either leave them outside (safest choice) or put the wetter bales on top of the dry shedded bales (less safe and monitor them for extreme heating).

If large squares are baled too wet i.e. not cured enough, their larger denser nature does not allow them to "breathe" and will heat substantially even without the added moisture from rain. This will occur if baled at over 15 - 18% moisture content and ideally, should be baled at less than 14% moisture. Most hay fires occur in large square bale stacks for this reason.

It is particularly hard to gauge the internal dryness of wet round bales which have been left in the paddock for several weeks so be ultra careful if they are eventually shedded.

All bales in the above situations will be much damper than desirable, even after a period of drying, so carefully monitor the shedded stack for several weeks watching for signs of dangerous heating. Be aware that bales sitting on damp paddocks, in puddles, or caught in rivulets of water or floods, are also a potential cause of spontaneous combustion.