

Managing rectangular baled hay around rain events

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Some hay seasons can be nightmares for many areas of Australia when rain affects either mown or baled crops. There are some techniques, albeit laborious, which can be very effective in reducing the amount of moisture soaking into your precious baled hay. If you do end up with rain on your square bales, or will 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 lean two more on their ends and lean against the inverted 'V' at right angles so that the group resemble an "Indian Teepee."

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. The 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.



Figure 1. Small bales stood on their ends



Figure 2. Bales stacked on their edges

Standing large square bales on their ends to shed rain, although not easily achieved may be well worth the effort. They will effectively shed most rain (Figure 3) and dry much quicker post rain.



Figure 3. Large rectangular bale stood on its end

Large square (rectangular) bales can be stacked to whatever size stack is practical and safe around the paddock(s). Stack size can vary from groups of two to three bales high to larger stack sizes. If stacks are of reasonable size and if possible, they should be covered with tarps or well tied/weighted with plastic sheets to prevent rain entering the bale surfaces and between the bales themselves. If unprotected stacked bales receive very heavy rainfalls or extended rain falls, a lot of moisture soaks down between the bales and has led to spontaneous combustion.

Remember the protective sheet should be a temporary fix only as the bales will generally need to continue to cure, especially 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 causes the ‘sweating’ of hay. Once confident the rain has passed, remove the cover to allow this sweat (moisture) to escape 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 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 be leave them where they lie.

Round bales, if tightly baled and net-wrapped, will shed much of the rain. 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 metre diameter round bale of hay is in the outer 30 cm so anything to reduce wastage of round bales 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 the safeness of bales when carting to the shed, they 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 empty equipment shed is available, stack the wettest bales over the largest area possible. 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 4 x 2's or sleepers between layers 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 shed space, leave them outside or put the wetter bales on top of the dry shedded bales. However, it would be preferable to spread these in another bay or shed until they were sufficiently dry. Move any equipment to another shed just in case!

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 16 - 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.