

Check your hay stacks regularly!

by
Frank Mickan,
DPI, Ellinbank

Spontaneous combustion (fire) resulted in several stacks of hay burnt around Victoria in 2006. This is never a good thing in any year but was even more devastating last year, as it will be THIS year with the higher cost of the hay, possible loss of equipment, general lack of available fodder, lack of water, tying up CFA crews to fight these event, etc.

The increased incidence of stack fires this year is similar to that experienced in the 2002/03 drought. In these extremely dry conditions, bales which have been baled at seemingly “safe” moisture levels for each bale type has still resulted in several stacks igniting. Why is this?

Why was bale heating and stack fires more common last year?

The increased incidence of haystack fires in 2006 was possibly caused by higher than normal sugar levels in plant cells, the difficulty in curing canola crops with reasonably thick, “wet” stems and cereals with “sappy” nodes. Perhaps the rush to get fodder into bales before proper curing to meet the urgent demand for fodder may have also been a precursor. There are also the usual suspects such as improper moist levels before baling with the respective baler type, too much dew at baling, sparks from machinery, etc.

Scientists believe that pasture and cereal crops experiencing severe drought conditions contain higher than “normal” levels of sugar in their cells. When these particular plants are baled the higher sugar levels lead to higher than normal plant respiration and microbial activity, generating higher than normal heat levels.

What was the range of moisture levels in hays in 2006?

Table 1 shows the moisture levels of canola, cereal and pasture hays for the 2006 season to end November. As can be seen by the very high moisture contents at the higher end of the range for each species, some “hays” should have been ensiled and are way too wet to be baled as hay, even if a hay preservative had been used!

Table 1. Moisture contents (%) of canola, cereal and pasture hays*

Hay type	Moisture content (%)		
	Canola	Cereal	Pasture
Average	15.5	12.9	15.5
Range	7.1 – 55.6	7.5 – 53.8	6.3 – 48.0

* Feedtest 1st. Oct. to end Nov. 2006

What are the signs of heating?

Regularly check your stack for signs of heating and very regularly if the stack temperature continues to rise. Signs of heating are: - moisture condensation on the roof, visible vapour or smoke, mould growth, acrid fumes, strong musty smell and hot, humid air at the top of the stack.

How can you determine the stack temperature?

Monitor the stack temperature regularly from when heating is first noticed. Do this using a crowbar inserted into as deep as possible into the stack. Push a crowbar as far as possible towards the centre of the stack. Leave it there for about two hours before removing it and feeling it by hand to give you a rough guide of the internal stack temperatures.

The temperature is up to about 50°C if you can hold the bar without discomfort. It is up to 60°C if the bar can be held for a short time only and up to 70°C if the bar can be touched only briefly. If you can't hold the bar, temperature is above 70°C and fire is a real possibility. Treat the stack with caution and call the fire brigade!

What can be done if hay heats to danger levels?

If a stack starts to get 'dangerously hot' pull it apart as quickly as possible. Avoid walking on top of the stack if possible because the extremely high temperatures may have lead to charring in the centre of the stack. You won't be aware of how hot the centre is and your extra weight on top of the stack might be enough to cause the top of the stack, and you, to collapse into the dangerously hot centre. If you must walk on the top, place a ladder or long wide plank to walk on, and ALWAYS have a second person positioned away from the stack to hang onto a lifeline tied around your waist.

Most shed fires tend to start from the outer sections of a stack at lower temperatures where oxygen is more available compared to the centre where temperatures can become extremely high before igniting. For this reason be aware that as the bales are pulled out, especially in a tightly built stack, oxygen will now be able to get to the extremely hot centre of a stack and explode into flame, similarly to throwing petrol on a simmering fire! Have the local fire brigade on hand, or at least a fire cart and definitely other people for safety purposes.

Warning!

If there is the slightest risk of a fire starting due to wet hay, NEVER keep machinery in the hayshed and do not allow the children to play in or near heating stacks!