



A guide for farmers

What causes haystack fires?

Haystack fires have a range of causes, such as sparks from machinery and equipment, embers from nearby burn-offs, or bushfires and lightning strikes. Hay can also self-ignite when excessive heat builds up. This is called spontaneous combustion, or spontaneous ignition, and is the leading cause of haystack fires in Victoria.

Haystack fires can happen in any type of bale stored in a haystack. Even hay stored as single bales can spontaneously ignite under some conditions. Haystack fires can spread quickly into the surrounding area and often result in thousands of dollars of damages.

Why does hay heat?

If hay is too 'green' (the internal plant moisture content is too high) or if some of the hay becomes damp before, during or after baling, a complex series

of biological and chemical processes may cause the hay to heat. This is because the plant material is still alive and using energy (respiration) and that microorganisms, such as bacteria and fungi, are able to grow in the moist environment. These processes, alone or in combination, generate heat which may result in the loss of dry matter, nutritive value, and reduced palatability.

If heating remains undetected and the stack is not pulled apart to allow heat and moisture to escape, such processes may continue and internal bale temperatures will keep rising. When the temperature reaches about 70°C, it may then increase rapidly to the point of spontaneous ignition (approximately 180°C). Spontaneous ignition may occur within two weeks of baling and may continue to pose a threat more than three months afterwards.

For a more detailed description of this heating process see the references overleaf.

Signs of heating hay

Regularly monitor all haystacks for signs that the hay is heating by using a temperature probe or a crowbar, although this will not detect heat deeper in the stack. Other signs of heating include:

- steam rising from haystacks
- condensation or corrosion under hayshed roofing
- mould growth in or on bales
- unusual odours (burning, musty, pipe tobacco or caramel)
- slumping in sections of haystack.

Minimising the risk

Make sure hay is fully cured (dead and dry) and at the recommended moisture content before baling. The recommended moisture content will vary depending on the type of crop and bale being used. Use a correctly calibrated moisture meter to check hay moisture levels throughout the baling process. Be sure to test plant nodes and heads inside leaf sheaths for

hidden moisture, particularly if baling drought-affected cereal hay.

It's important to remember that just one damp bale is enough to ignite a haystack, so make sure you protect all bales from rain, leaking roofs and spouts, and runoff. If some bales become damp, they should be stored separately and closely monitored.

Make sure haystacks are limited in size and have enough airflow to allow heat and moisture to escape.

It's important to know the history and moisture content of the hay you purchase.

Store hay away from possible sources of ignition (such as roadsides, workshops, and fuel and chemical storage areas) and away from vegetation that may produce embers if a fire does occur.

Be careful when using vehicles, machinery and equipment near haystacks, especially on high fire risk days.

Store hay well away from powerlines because hay can be a source of ignition. If hay does ignite under or near powerlines, it could be very dangerous and may disrupt the local power supply.

Protecting your assets

Store hay in a number of different locations around your farm and limit the size of the stacks. This will reduce the risk of losing all your hay if a fire does occur.

Hay should be stored away from houses and other key assets. Do not store vehicles, machinery and equipment with your hay.

Create and maintain fuel breaks around haystacks. The wider the break, the more useful it will be at helping to stop a haystack fire from escaping into the surrounding area, or to stop a fire from reaching your stored hay.

What to do if hay is heating

If there are signs that the hay is starting to heat, pull the stack apart to improve airflow and allow the bales to cool.



Be aware that very hot hay may suddenly catch alight if it is pulled apart. If any part of the stack is near or above 70°C or you see or smell smoke, you should call Triple Zero (000) immediately and ask for assistance from CFA.

Do not walk across hay that may be heating. Charred bales inside the stack may suddenly collapse and result in entrapment, and the rush of air may result in a sudden flare-up.

Preventing haystack fires

Key things to remember

- ✓ Ensure hay is fully cured before baling.
- ✓ Bale and store each bale type at the correct moisture level.
- ✓ Know the history of hay that you purchase, particularly its moisture content.
- ✓ Protect hay from rain, leaking roofs and spouts, and cover stacks with tarps or hay caps.
- ✓ Store hay in a number of different locations around your farm, away from key assets. Limit the size of stacks to reduce the risk of losing all of your hay.
- ✓ Do not store vehicles, machinery and equipment in your hayshed.
- ✓ Be careful when operating vehicles, machinery and equipment near your haystacks.
- ✓ Create and maintain fuel breaks around your haystacks.
- ✓ Regularly monitor stored hay for signs of heating.
- ✓ It only takes one heating hay bale to ignite a whole haystack.

Further information

Agriculture Victoria
agriculture.vic.gov.au

Australian Fodder Industry Association
afia.org.au

*Knowledge, Patience and Experience:
The Cure for Quality Hay*
(Technical Notes, AFIA 2008)

Country Fire Authority
cfa.vic.gov.au

Contact

CFA Community Safety (03) 9262 8444
or cfa.vic.gov.au

VicEmergency Hotline **1800 226 226**
(or via National Relay Service on
1800 555 677) if you are hearing
impaired).

Translating and Interpreting Service
for translated information from
VicEmergency call **131 450**.

Dial **000** if you see smoke, flame
or embers.