This leaflet offers practical safety advice to all those involved in the handling and transporting of baled fodder and straw. It deals with the collection, loading, transporting and stacking of conventional bales, round bales and big/high-density bales. It details most of the common causes of bale accidents and gives advice, based on good practice, on how to avoid such accidents. It aims to help people at work comply with health and safety law.

**Accidents: numbers and costs**

The Health and Safety Executive (HSE) investigated 202 bale handling and stacking accidents between 1986 and 1996. Of these accidents, 23 were fatal and some of the others caused injuries serious enough to stop those involved from working again.

Not every bale-related accident involves personal injury. In most cases equipment is damaged and in every case there is costly loss of time.

Handling and stacking bales is a hazardous business - you must manage it to make it safe.

**Legal duties**

Employers have duties, under the Health and Safety at Work etc Act 1974 (HSW Act), to:

- provide and maintain safe systems of work;
- provide equipment which is safe to use; and
- give information, instruction, training and supervision to employees.

Self-employed people have a duty to safeguard themselves and others who may be affected by their work. Similar duties apply to employees and they must co-operate with their employer about health and safety matters.

The Management of Health and Safety at Work Regulations 1999 and the Manual Handling Operations Regulations 1992 require employers and the self-employed to carry out a risk assessment of the hazards in
connection with manually handling and stacking bales.

Also because this type of work involves equipment, the Provision and Use of Work Equipment Regulations 1998 require that such equipment is safe and suitable to use with the type of bale being handled and where it will be stacked.

The Workplace (Health, Safety and Welfare) Regulations 1992 require the workplace to be made and kept safe, for example preventing falls (of bales or people) from stacks in buildings as well as from trailers.

Employers should remember to consider the views of their employees or representatives as they often have personal knowledge or experience of the hazards of bale handling and stacking and may offer practical, common-sense suggestions on what should be done to avoid accidents and minimise health risks. Involving employees will gain their commitment and help make the work activity safe.

Handling and stacking bales safely

The following section gives examples of accidents which have been investigated and lists the ways in which the accidents could have been avoided.

Bale loading and unloading equipment

Operator electrocuted while loading/unloading bales

- Don’t work under or within 9 m horizontal distance of overhead power lines and lower loading equipment when passing under them.
- Never build stacks within 9 m horizontal distance of overhead lines.
- Mark farm map(s) with the route of overhead lines and make sure operators and/or contractors are aware of this information.

Operator or other person struck by bale which fell from loader

- Use properly designed,
constructed and maintained bale handling equipment.

- Ensure operators are trained in the use of the machinery and equipment.

- Don’t carry more bales than the equipment is designed to handle.

- Two spikes are better than one to ensure a bale is held securely.

- Have well-maintained, enclosed safety cabs on tractors, and falling object protection for drivers of other materials handling equipment.

- Don’t carry a bale or bales which obscure your vision on a spike or on a loader on the highway.

- Keep non-essential personnel away from where you are working.

*Loading equipment failed/toppled over*

- Ensure that tractor fore-end loaders are suitably counter-balanced.

- Adjust wheel track to set wheels to the widest practicable setting.

- Check operator manuals and ensure that axles and tyres are not overloaded.

- Don’t lift more than the machine or equipment is designed to lift.

- Avoid sharp turns and keep your speed down.

- Lower the loader while transporting bales.

- Check the machine for faults and maintain it.

*Person injured by loader spike/tine*

- Remove spikes before travelling on the highway and when they are not required, or cover them so that they are not a danger to other road users.

- If the design allows, fold back spikes/tines in a safe position when not in use.

- Spikes should not protrude through bales.
**Person run over by mechanical loader**

- Keep people out of the area where a machine is working.
- Check around the machine before moving off, particularly for children.

**Loading trailers**

*Stacker fell from load during stacking*

- Ensure that trailer floors are in good repair and are maintained in a safe condition.
- Build a load so that it binds itself using sound bales for all edges.

- Wait until anyone on the load gives clear signals that they are ready before moving off with a vehicle.
- People stacking bales need to keep away from the edges of loads and avoid over-reaching for bales.

*Bales fell from load when trailer was being stacked*

- Build loads to suit the journey to the storage site.
- Avoid overloading trailers and other vehicles.
- Loads should only be as high as the design of the trailer allows.

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**Figure 1** Only use properly designed and suitable handling equipment
Trailer end racks or hay ladders will help to secure a load.

All loads should be secured, eg roped.

Avoid crossing ruts etc with a partially completed load and keep your speed down.

**Stacker injured while getting down from loaded trailer**

- Use a ladder. Using a rope or end rack or hay ladder can be dangerous.
- Stackers should alight from the trailer before it moves off.
- **Never** carry passengers on completed loads or bale transporters.

**Other points to remember**

- Be aware of overhead power lines and other overhead hazards (such as tree branches) when loading trailers.
- Ensure that hay racks etc are securely attached to the trailer.
- Drivers should ensure that all people are well clear of the trailer before moving off.

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**Transporting bales**

**A loaded trailer overturned**

- Don’t drive off with an unstable load (roping an unstable load will not make it safe).
- Don’t load a trailer with a tall load (the higher the load the more likely it is to overturn), even if it means that the trailer is not carrying its maximum load.
- Don’t overload a trailer and ensure that tyre pressures are correctly set.
- Choose the most suitable route in the field and for the journey.
- Consider the effects that ruts, sloping ground, rough tracks and sharp turns through gateways will have on a load.
- Make certain the trailer is securely connected to the tractor or towing vehicle.

**Bales fell off a load while being transported**

- Use trailers or vehicles which allow loads to be secured to them.
Don’t stack bales beyond the edge of the trailer.

Adjust speeds to the road conditions.

Avoid hard braking or any manoeuvre which will rock or dislodge bales.

Choose a route without overhead obstacles liable to dislodge bales, eg trees and bridges etc.

**Stacking and destacking bales**

*Stacker fell from stack being built*

- Stacking requires skill, which means stackers should be trained.
- Only people who are fit and are able to work at heights should work on stacks.
- Build stacks so that the bales are well interlocked.
- Use sound bales for all edges.
- Avoid working near edges and keep away from bale loading equipment.

*Consider guarding the edges of stacks in buildings by fencing in non-loading sides.*

*Stacker injured while getting down from stack*

- Use a strong ladder, which is secured to prevent it slipping and is long enough for the job.
- **Never** get down from a stack using elevators or loaders.

*Bales fell when stacking/during storage/when destacking*

- Build stacks on firm, level ground and away from fire hazards, overhead power lines and dwellings and where high winds will not dislodge bales. If round bales are stacked on slopes they should be secured and then removed as quickly as possible.
- Bind bales during stacking to prevent movement or collapse.
- Fence stacks off if livestock have access or if near to a footpath or boundary fence.
- Keep non-essential people away from stacks during stacking and destacking.
Never build a stack higher than the reach of equipment available to destack it.

Sheet stacks, if it is safe to do so, to prevent the top layers of bales becoming saturated and top heavy.

When destacking take down the top bales before the others.

Don’t dislodge or pull out bales as this will cause a stack to become unstable; rebuild or prop stacks which are unstable.

Watch for and control rodents; they can undermine and affect the stability of a stack.

**Stacks**

- Plan the site for your stack.

- Try to avoid siting stacks near to roads and public footpaths to avoid them being set on fire by discarded cigarette ends etc.

- Stacks should preferably be sited well away from residential properties.

- It is advisable not to stack within 6 m of buildings and where there are greater risks, eg thatched roofs, then 24 m separation distance would be more appropriate. In any case the separation distance should reflect...
the risk to the adjacent property should the stack catch fire.

- It is recommended that where several stacks are sited together they should be built in a line across the prevailing wind and not less than 24 m apart.

**Note:** The distances quoted are examples only and the individual circumstances at each stacking site need to be taken into consideration.

**Conventional bales**

- Stack no higher than 1.5 times the shortest baseline measurement of a stack.

**Big square or rectangular bales**

- Stack no higher than 1.5 times the shortest baseline measurement.
- For long-term storage stack the bales on the unstrung sides.
- Overlap bale layers at regular intervals.
- Overlap the top layers to bind in the vertical columns.

**High-density bales**

- Stack to a maximum of 1.5

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*Figure 3* Large, square bale stack - note lack of overlap between layers
times the shortest baseline measurement.

- For long-term storage stack the bales on the unstrung sides.
- Overlap bale layers at regular intervals and bind in vertical columns.

**Big round bales (all types)**

**Pyramid stacking**

- Stack not more than four bales high and consider chocking the bottom rows of outside bales.
- Ensure layers overlap by half a bale.
- Be aware of possible settling of the bales when destacking and always destack the bales in the reverse order of stacking.

*Stacked on end*

- This stacking method can lead to unstable stacks. Inconsistent bale density allows bales to settle and leads to instability. Alternative methods of stacking, eg pyramid stacking, should be used.

*Figure 4* Pyramid round bale stack - note lack of chocking
Wrapped round/square bales

If the bales are:

- below 25% dry matter (DM) - stack in single layers;
- between 25-35% DM - stack two bales high;
- between 35-45% DM - stack three bales high.

Special care needs to be taken when stacking and destacking wrapped bales as the plastic wrapping can make the bales slippery.

Other points to remember

- Ensure the base for the stack is level and firm. This is particularly important for long-term storage.
- Bales forming the top of drying tunnels need supporting to prevent collapse.
- Ensure that engines of bale elevators are kept free of straw and other debris to avoid causing a fire.

Figure 5  On-end round bale stack - Do not use this method
Safe escape routes are required when building stacks in barns in case of fire.

Never stack bales higher than the equipment that will be used for destacking can reach.

Monitor the construction of the stack to ensure it remains stable during and after stacking.

**Inspection of stacks**

Stacks should be inspected at regular intervals, taking into account, for example, recent weather conditions (eg heavy rain, high winds etc), location of the stack (eg near to work activities, public footpaths etc) and, after any destacking activities, to ensure the stack remains in a stable condition.

When inspecting stacks take into account the following:

- Monitor the density of the perimeter/upper layers of the stack during, and after, rainfall.

- If the stack becomes top-heavy due to the ingress of rain, remove the upper layers carefully to restabilise the stack.

Ensure the density of the bales is consistent throughout the stack, particularly around its perimeter.

Check for bales which have moved within the stack resulting in a reduction of overlap between layers or columns of bales.

Check for movement of bales within the stack resulting in a reduction in overall stability.

Remember, the person checking the stack may be at greatest risk and should take extra care.

**Other hazards**

**Children**

Children are attracted to bales and stacks.

- Prevent children from playing with bales, climbing onto stacks and making dens inside them.

- Educate children about matches and fire risks.

- Teach children about the dangers of bales and stacks.
and keep them away from them and any associated activity.

- Look for tell-tale signs of children in stacks: bales built to make a den, toys or clothes lying on bales.

- Remove ladders to prevent children gaining access to bales in a stack.

- Do not allow children to be present during stacking and destacking operations.

**Health risks**

*Operator complained of back strain following stacking work*

- Reduce manual handling of bales by using mechanical bale handling equipment.

- If bales have to be handled manually then make sure that those doing so are physically capable and have been properly trained in manual handling.

- Carefully check beforehand that you are able to lift or move bales without injuring yourself.

- Handle bales at a height which is comfortable; avoid lifting bales above waist height.

*Operator complained of breathing difficulties after working with bales*

- Bales create dust and an assessment of the level and type of dust is required.

- Avoid shaking out bales which are mouldy or particularly dusty.

- Operators likely to be exposed to high levels of dust should wear a suitable dust respirator, eg a disposable filtering face piece dust respirator (FFP2S) to BS EN 149. This type of protection becomes vital if wet or mouldy bales are discovered in a stack. Remember to consult with employees when selecting dust masks etc to ensure that they are a good fit and comfortable to wear.

- To avoid ‘farmer’s lung’ remove bales affected by mould using a machine rather than by hand.
Further reading

5 steps to risk assessment
INDG163 (Free leaflet - priced for multiple copies)

Avoidance of danger from overhead electrical lines Guidance
Note GS6 (rev) HSE Books 1997
ISBN 0 7176 1348 8

Getting to grips with manual handling INDG143 (Free leaflet - priced for multiple copies)

Manual handling solutions for farms AS23 (rev2) (Free leaflet)

ISBN 0 7176 2488 9


ISBN 0 7176 2455 2

Shock horror: key facts: safe working near overhead power lines in agriculture MISC049 (Free leaflet). (A video and teaching pack are also available, Shock horror: safe working near overhead power lines in agriculture, £49.50 (or £14.85 for hire of video only) from HSE Videos, PO Box 35, Wetherby LS23 7EX. Tel: 0845 741 9411 Fax: 01937 541083)

ISBN 0 7176 1626 6

Working safely near overhead power lines Agriculture
Information Sheet AIS8 (Free leaflet)

ISBN 0 7178 0413 6

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Further information

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This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.