Controlling grain dust on farms

Agriculture Information Sheet No 3 (rev)

Introduction

Grain dust is produced when cereal crops and maize are harvested, dried, moved, stored and processed. The dust includes bacteria, fungi, insects and possibly pesticide residues as well as dry plant particles.

Inhaling grain dust can cause ill health, for example asthma, bronchitis and grain fever. Some people can become sensitised to the dust; this means that any subsequent exposure, even at a low level, can result in nasal or eye irritation or trigger an attack of asthma. Grain dust may contain mould spores that, if inhaled, can cause the potentially fatal disease, Farmer's Lung.

This information sheet:

- examines and assesses the processes in agriculture which create grain dust;
- gives advice on how the dust can be controlled; and
- provides information about legal requirements aiming to protect the health of those coming into contact with grain dust at work.

Processes causing grain dust

Processes that create high levels of grain dust in agriculture include:

- harvesting grain and transferring grain from combines into trailers;
- transferring grain from trailers into grain pits or grain stores;
- moving grain about in a grain store;
- cleaning and dressing grain;
- milling and mixing dry grain;
- feeding dry milled grain;
- cleaning up in grain stores.

Some of these processes may involve equipment that has not been designed to protect operators from grain dust, eg a combine without a cab or a grain store with no suppression or extraction equipment.

Assessing the risk

The table below gives the levels of dust in an operator's breathing zone measured during a recent study of grain harvesting and handling equipment.

The table suggests areas on which your risk assessment should concentrate - combining, grain carting, work in grain stores and milling/mixing grain for animal feed. Visible dust clouds, layers of dust on floors, ledges and equipment, or dust leaking from machinery, indicate that there is a problem requiring action to be taken to reduce dust at source. Remember, you can't usually see the very fine dust that you can breathe into the depths of your lungs, and which will cause most harm.

Process	*Dust level measurement averaged over 8 hours*	*Comments*
Combining (no cab)	18 to 41 mg/m^3	2-4 times daily legal amount
Combining (with cab and air filtration)	0.2 to 2.5 mg/m^3	$^1/_4$ of daily legal amount
Grain carting work	1 to 40 mg/m^3	Up to 4 times daily legal amount
Grain drying	4 to 57 mg/m^3	Almost 6 times daily legal amount
Milling and mixing	0.1 to 11 mg/m^3	Can exceed daily legal amount

Note: the workplace exposure limit (WEL) for grain dust, averaged over 8 hours, is 10 milligrams per cubic metre (mg/m^3). Exposure should be reduced to as low as is reasonably practicable and should not exceed the WEL.

Action plans to control grain dust

You can control grain dust by eliminating or changing any of the following processes. Solutions that you may wish to consider include the following:

Harvesting grain and transferring grain from combines into trailers

- Change from an uncabbed combine to one with a cab equipped with air filtration, or use contractors who have a cabbed combine.
- Use tractors with cabs fitted with air filtration.
- Fit a dust sleeve over the unloading auger.

Transferring grain from trailers into grain pits or stores

- Ensure that the operator stays in the cab and out of the dusty area, if necessary by adapting equipment.
- Fit baffles, screens or extraction fans to reduce the dust above the grain pit and stop it from getting into the grain store.

Moving grain about in a grain store

- Fit covers over grain conveyors.
- Cover holes in elevators or conveyors to prevent dust escaping into the store.
- Put fixed or portable dust extraction equipment at those places where dust is difficult to suppress.
- Check that all extraction fans effectively remove dust.
- Use materials handling equipment fitted with cabs to move grain in on-floor stores - consider taking out of use equipment which causes high levels of dust which cannot be reduced by engineering changes.

Cleaning and dressing grain

- Screen equipment to prevent dust spreading into other parts of the store.
- Use an industrial vacuum cleaner to keep equipment and surrounding areas dust free.

Milling and mixing dry grain

- Change to an enclosed self-feed system running with some automatic controls to avoid constant attention.
- Fit sleeves, baffles or screens to prevent dust escaping into other parts of the building.
- Check that dust bags have no holes which allow dust to escape.
- Use an industrial vacuum cleaner to keep the area dust free.

Feeding dry milled grain

- Change to a wet feed system.
- Use less dusty feed, eg cubes or nuts, or use a dust suppressant such as molasses mixed in the feed.

Cleaning up in grain stores

- Avoid creating dust clouds when cleaning. Do not sweep or use air-lines to keep the building dust free - use an industrial vacuum cleaner to clean ledges, floors, bins etc.
- Investigate all causes of damp which may cause dust or spilt grain to become mouldy.
- Use portable dust extraction equipment when cleaning out grain bins.

Personal protective equipment (PPE)

As a last resort and after taking all other reasonably practicable measures to control dust, you may need to use respiratory protective equipment (RPE) and other PPE. Suitable RPE includes a disposable filtering face piece respirator to BS EN 149 or a half mask respirator to BS EN 140 with particle filters to BS EN 143. Unless you carefully select and use RPE, it is unlikely to be effective in providing protection - consult your supplier for advice.

Other PPE can include a coverall that will prevent dust from settling on personal clothing and eye protection to prevent dust affecting the eyes. Make sure you remove dust from personal or protective clothing before you take off a dust respirator.

Legal requirements

Grain dust is a hazardous substance as defined by the Control of Substances Hazardous to Health Regulations 2002 (COSHH). It has been given a workplace exposure limit (WEL). This means that a person at work must not be exposed to 10 mg/m^3 or more of grain dust averaged over 8 hours. The WEL is a maximum, not a target. All reasonably practicable measures must be taken to reduce exposure as far below the WEL as possible.

The COSHH Regulations require employers and the self-employed to:

- assess the risk to health from work activities which involve a hazardous substance;
- prevent or, where this is not reasonably practicable, adequately control exposure to hazardous substances;
- introduce and maintain control measures;
- inform, instruct and train employees about the risks and precautions to be taken.

It is good practice to involve employees in a risk assessment - they often have personal experience of the processes that create grain dust and may be able to offer common-sense solutions to reducing exposure to the dust. Employees must co-operate with their employer in matters of health and safety.

Health surveillance

COSHH requires an employer to provide adequate health surveillance for all employees who are exposed to grain dust unless their COSHH assessment has shown that there is unlikely to be a risk of sensitisation under the conditions of use.

This means that:

- you should find out about employees' past and present respiratory symptoms (for baseline information only), preferably by way of an examination by an occupational health professional;
- you should tell employees what symptoms to look out for and advise them to report any symptoms to a responsible person;
- you should regularly ask your employees to fill out a questionnaire about respiratory symptoms. This should be given to new employees at 6 and 12 weeks after starting work and then every year. These questionnaires can be given out and checked by a 'responsible person' trained by an occupational health nurse or doctor, who can also advise on the content of the questionnaire;
- also, depending on the degree of risk, you may need to consider providing for your staff regular examinations by an occupational health nurse or doctor.

Occupational asthma resulting from work involving grain dust, and Farmer's Lung, are, if confirmed by a doctor, reportable diseases under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR). Send RIDDOR reports to: Incident Contact Centre, Caerphilly Business Park, Caerphilly CF83 3GG. Tel: 0845 300 9923, Fax: 0845 300 9924 website: www.riddor.gov.uk e-mail: riddor@natbrit.com

Further reading

Control of substances hazardous to health. The Control of Substances Hazardous to Health Regulations 2002 (as amended). Approved Code of Practice and guidance L5 (Fifth edition) HSE Books 2005 ISBN 0 7176 2981 3

Grain dust Environmental Hygiene Guidance Note EH66 (Second edition) HSE Books 1998 ISBN 0 7176 1535 9

Preventing asthma at work. How to control respiratory sensitisers L55 HSE Books 1994 ISBN 0 7176 0661 9

Farmer's Lung Leaflet AS5 HSE Books 1988

Further information

HSE priced and free publications are available by mail order from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA Tel: 01787 881165 Fax: 01787 313995 Website: www.hsebooks.co.uk (HSE priced publications are also available from bookshops and free leaflets can be downloaded from HSE's website: www.hse.gov.uk.)

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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.

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