



Respiratory Hazards in Agriculture

Instructor: The following script can be used to deliver a 15- minute training session to employees.

POINTS TO EMPHASIZE

- Minimize exposure to dust and spores.
- Minimize exposure to gases.
- Personal Protective Equipment.

Dust and mold spores are encountered in many agricultural activities, and are often associated with respiratory illnesses, such as Farmers Lung, Q Fever, Toxic Organic Dust Syndrome, and Extrinsic Allergic Alveolitis.

Engineering practices

The prevention of particle release and control of dust is achieved by providing leak proof ducts and enclosed conveyor systems for grains and feeds. Buildings should have local ventilation systems in areas frequented by workers where particulates become airborne. For field operations self-propelled equipment should have enclosed cabs provided with filtered air. Where crushers, grinders and mixers are used, the area should be enclosed to contain the airborne materials.

Work practices

There are several practices that can either help prevent the growth of mold spores or limit the damage they can cause. The following measures are recommended:

Harvested crops such as hay and grains should be dry when stored (14% moisture content) Hay with a high risk of spoilage should be stored in silage instead of being baled. Ventilate areas where bales are being opened and wear respiratory protection when doing so.

Sprinkling one litre of water onto the cut side of the bale immediately before opening or chopping it can reduce airborne moulds and dusts. Anti-fungal agents may be applied to fresh material and hypochlorite solution may be used for grain. However a risk of chemical fume inhalation may be created.

Indoor humidity should be maintained below 80% to reduce air borne organisms. Rotating crops will help to decrease fungal growth.

Fungi and dust from grain and animal confinement can be eliminated by using pellet feed rather than dusty chopped feed, or by substituting silage for hay.

When cleaning use a wet process.

Use a fork to spread out open bales rather than doing it manually.

Moisten the top layer of silage before opening it.

In the fields, you can lower the speed of equipment to reduce the release of fine particles.

Organize equipment and work practices so that any prevailing wind can carry the dust away from your face.

Indoor dust minimizing practices include pressure washing with cold water, water with additives and sprinkling with agents such as vegetable oil. Animal feeding should be done just before leaving a room to limit worker exposure. Fast dumping of large amounts of material creates greater amounts of dust.

Gases

A variety of potentially toxic gases are produced during many routine agricultural operations. These gases are commonly produced in areas such as silos and manure pits.

Nitrogen oxides - (mainly in silos) loading and distributing the silage should be done by mechanical means if possible. Do not enter a silo until 2-3 weeks after filling, post warning signs, and run the blowers for at least 30 minutes before entering a filled silo. Workers entering a silo should wear an air supplied full face respirator and follow confined space entry procedures.

Carbon monoxide - ensure that equipment such as gas heaters, pressure washers and vehicles are functioning properly. When working indoors ensure the building is well ventilated, especially where internal combustion engines may be operating.

Ammonia - Ammonia concentration can be reduced in poultry barns by the use of peat for litter. Keep bedding dry to reduce Ammonia levels, low-residue flooring, such as wire mesh or narrow slats, keeps urine and feces from accumulating resulting in less ammonia evaporation and pulverization of feed and fecal material.

To reduce ammonia levels in livestock buildings, prevent air leakage through manure channels. Exhaust as much air as possible through the manure channels. Use tight fitting hatches, water traps or evacuation fans to eliminate air leakage.

To decrease hydrogen sulfide leaks, there should be a gas trap between the confinement building and outside storage, airflow should be directed towards the floor to keep dust and gases from entering the breathing zone of the worker.

Manure should not sit in the pit for more than three weeks. Do not enter manure pits during agitation.

If manure is beneath a slatted floor, plenty of water should be used to keep manure solids submerged and the gases in solution.

Farm chemicals

Pesticides, fertilizers, and sanitizers are common farm chemicals which produce harmful fumes.

Always follow label direction when handling these chemicals. Regularly maintain spraying equipment to avoid rupture/leaking valves crossing threading leaking valves and hose that may become disconnected. Spray booms should be on the back of the vehicle thus reducing the worker exposure to chemicals.

Personal protective equipment.

The selection of specific types of protective equipment depends on the hazard present and the amount of filtering necessary. There are two general types of air-purifying respirators: the mechanical filter and the chemical cartridge. Chemical cartridges protect against certain gases and all but the most toxic vapours. Its primary function is to remove organic vapours. Chemical cartridges that work in conjunction with a specific mechanical filter should be used for protection during spray painting or pesticide application. Do not use chemical cartridge filters when working with gases or vapors that cannot be effectively filtered out by the cartridge, regardless of concentration.

A mechanical filter respirator with toxic dust approval should be used to protect against grain dust and molds. It should be tightly sealed around the nose and mouth. Do not use a mechanical filter for protection from chemicals or toxic gases.

Powered air purifiers can be a mechanical filter, a chemical cartridge or both. They may be preferred for excessively high concentration of dust or pesticides, but they cannot be used in oxygen-limited environments. Gas masks are more effective than chemical cartridge respirators against high concentrations of toxic gases, but should not be used in oxygen-limited environments.

Air supplied respirators- two types of air supplied respirators are approved for use in oxygen deficient areas, such as manure pits, silos containing silo gas, air-tight silos or bins containing high-moisture grain. They are hose mask with blower and emergency air supply and the self-contained breathing apparatus.

These respirators all offer effective protection against toxic dust. The primary differences are the quality of fit, the length of time the protection will be provided and the cost.

Finally, let's take a moment to review some of the Do's and Don'ts of respiratory hazards.

DO:

- Dry wet hay, grain or other crops.
- Use a wet process when cleaning.
- Control feed rates.
- Use chemical cartridges for toxic organic vapours.

DON'T:

- Enter a silo or manure pit without an air-supplied full face respirator.
- Use a mechanical filter for protection from chemicals or toxic gases.

The information and recommendations contained in this publication are believed to be reliable and representative of contemporary expert opinion on the subject material. The Farm Safety Association Inc. does not guarantee absolute accuracy or sufficiency of subject material, nor can it accept responsibility for health and safety recommendations that may have been omitted due to particular and exceptional conditions and circumstances.

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