Respiratory Hazards in Agriculture



Safety Talk

WHAT'S AT STAKE?

Farmworkers are exposed to many harmful particles and gases that, overtime, cause permanent damage to the respiratory tract. The hazardous elements are invisible, and most often go unnoticed. Workers must be made aware of what these hazards are, and how they can avoid the many irreversible, long-term effects.

WHAT'S THE DANGER?

Agricultural settings host a multitude of sources of exposure to irritants and allergens: dust, mold, gases, pesticides, and chemicals all contribute to an increased risk of respiratory disease. Farmer's lung, Toxic Organic Dust Syndrome, Extrinsic Allergic Alveolitis, Asthma, Rhinitis, Chronic Obstructive Pulmonary Disease (COPD), and significant lung-function decline are results of exposure to dangerous particles and gases generated by agricultural work. Without using the proper PPE, and implementing preventative measures, damage to the respiratory system is inevitable.

EXAMPLE

An 80-year-old farmer spent the last forty years of his life suffering from asthma, an illness triggered by working with pesticides most of his life. As a child he worked alongside his parents on their farm and continued the work into adulthood. The use of herbicides and fungicides over several years exposed him to such a high amount of toxicity, causing a rapid decline in respiratory function, triggering asthma in his early forties. Quality of life was significantly and negatively affected.

HOW TO PROTECT YOURSELF

All equipment, containers and workspaces should be visibly labeled with clear warnings.

Understand the different sources of respiratory failure in agriculture, and the methods used to eliminate them:

Dusts and mould spores

- Be sure conveyor systems for grains and feeds are enclosed and have leak proof ducts.

- Areas with airborne particulates and that are frequented by workers (e.g. spaces where bales are being opened, etc.) should have ventilation systems. Open bales with a fork rather than doing it manually.
- Harvested crops should be stored dry (14% moisture content).
- Self-propelled equipment should have enclosed cabs with filtered air.
- Enclose areas that produce airborne materials.
- Use pellet feed rather than chopped feed, and substitute silage for hay to eliminate dust and fungi.
- Use a wet process when cleaning.
- Keep yourself upwind from equipment or workspaces.
- Slow down. This includes decreasing the speed of equipment in fields and dumping material, which reduces the generation of fine particles.
- Pressure washing with cold water, water with additives and sprinkling with vegetable oil minimizes indoor dust.
- Feed animals just before leaving the room.

Gases

Nitrogen oxides (Mainly in silos) – Post warning signs outside silos, avoid entering a silo for 2-3 weeks after filling and run the blowers for at least 30 minutes before entering.

Carbon monoxide – Properly ventilate all buildings where internal combustion engines are running, and ensure all equipment is functioning properly.

Ammonia – Avoid entering manure pits during agitation. Use peat for litter in poultry barns and be sure to keep dry. Ensure to exhaust as much air as possible through manure channels, and use tight fitting hatches, water traps or evacuation fans.

Hydrogen Sulfide (H2S) – Considered the deadliest by-product of manure decomposition, this gas is heavier than air with a distinct smell of rotten eggs. Ensure there is a gas trap between the confinement building and outside storage and direct airflow towards the floor, keeping dust and gases out of the worker's breathing zone.

Carbon Dioxide (CO2) – Like H2S, it is another by-product of manure decomposition and fermentation and is heavier than air but is difficult to detect. It causes shortness of breath and dizziness and, at higher concentrations, death.

Methane (CH4) – An odorless gas that collects at higher elevations, as it is lighter than air. Like CO2, it acts as an asphyxiant, but is also highly explosive.

Farm Chemicals

- These include pesticides, fertilizers, and sanitizers.
- Be sure to follow label directions.
- Regularly inspect and maintain spraying equipment to prevent ruptured/leaking valves.

Always use PPE that is appropriate to the job. There are two types of air-purifying respirators, which can be used in environments with a high concentration of dust and pesticides, but should not be used in oxygen-deficient settings:

1. **Chemical cartridge** – Protect against some gases and vapours. When spray painting or applying pesticide, a chemical cartridge should be used with an appropriate mechanical filter.
2. **Mechanical filter** – Should be used with toxic dust approval to protect against grain dust and moulds.

Use **air-supplied respirators** (either a hose mask with blower and emergency air supply or a self-contained breathing apparatus) in oxygen limited environments.

FINAL WORD

The condition and treatment of our oxygen supply is something that cannot be overlooked and abused. Long-term exposure to various dusts, moulds, gases, and chemicals can cause detrimental effects to our respiratory tract, resulting in a lifetime fighting to breathe. Educating yourself on the dangers and taking the appropriate steps to prevent them is crucial in all agricultural environments.