Agriculture Respiratory Hazards

Agricultural workers are exposed to numerous on-the-job respiratory hazards. Pesticides, fertilizers, dusts, disinfectants, paints and gases are just a few of the hazards, which may be encountered. Serious respiratory problems can develop from prolonged exposure to any of these airborne contaminants. To avoid these respiratory illnesses, it is important to recognize the specific hazards and wear the proper respiratory protection.

Respiratory hazards are usually categorized as smoke and fumes, sprays and mists, dusts, and gases and vapors. Smokes and fumes are very tiny solid particles suspended in the air. They can be generated from welding to burning plastic materials. Sprays and mists are small liquid droplets that occur from spraying pesticides, paints, disinfectants, etc. Dusts are suspended solid particles ranging greatly in size. Dusts can be generated from grinding, milling, drillings or created in e.g. the poultry house or in a dusty field. Gases and vapors are molecules in the air and are typically found in confined spaces.

Dusts
Exposure to grain dust, molds, pollen, animal dander, soil dust, welding fumes, and diesel exhaust can lead to serious respiratory problems. Although they are less toxic than some chemicals, dusts are suspended in the air and can easily enter the lungs and cause damage.

Dust in the lungs has both immediate and long-term effects. It can cause additional physical stress for the person, resulting in fatigue or shortness of breath. Over time, exposure to dust can result in serious respiratory illnesses, such as farmer's lung, asthma, emphysema, chronic bronchitis, pneumonia and other irreversible, incurable ailments.

Anhydrous Ammonia
Anhydrous ammonia is a strong alkali that can cause death or severe injury to body tissue due to its caustic, corrosive, freezing and dehydrating action. An almost instant freeze-drying process occurs when the liquid Ammonia comes in contact with body tissue.

Exposure to anhydrous ammonia can happen suddenly and is almost always unexpected. The best ways to reduce risk of serious injury from anhydrous ammonia exposure are to wear protective equipment and to know what to do in an emergency.

Safety Tips
- Always use gloves and goggles approved for handling anhydrous ammonia when transferring anhydrous or when checking for worn hoses and plugged applicator knives.
- An approved respirator and goggles should be available in the pickup or tractor bringing the nurse/supply tank to the site and on the tractor used to apply ammonia. If wind conditions are right, a leak could result in a cloud of ammonia that may cover the equipment - the only safe way out of this cloud is by wearing a half-face respirator and goggles or a full-face respirator. Both respirators and goggles must be approved for anhydrous ammonia applications.
- The first treatment for any exposure to anhydrous ammonia exposure is to flush the area with clear water for at least 15 minutes. Always seek medical attention after any exposure to anhydrous ammonia.

Other Respiratory Hazards
Pesticides, disinfectants and litter amendments are other potential respiratory hazards on farms. These products are safe when applied according to manufacturer's recommendations. However, they can pose serious health concerns when applied inconsistent with recommended application procedures, and without the appropriate respiratory and personal protection equipment. Also, remember all chemicals are not compatible and therefore mixing some chemicals can cause serious health consequence. Users of farm chemicals should thoroughly read and understand the label information and specifically the health hazards and safety precautions. If there are any questions, don't hesitate to contact the retail supplier, manufacturer or Extension Service.
Selection and Use

Air-purifying respirators offer adequate protection against many common agricultural respiratory hazards. There are many considerations during evaluation, selection and use of air-purifying respirators: correct respirator selection, proper fit, necessary regular maintenance, and an assessment of the situation where the respirators will be used. Disregarding any of these items may result in a danger for the wearer due to a false confidence in the respirator’s ability to protect. The user of an air-purifying respirator must understand its limitations and recognize situations that require more extensive protection.

Never use air-purifying respirators when:

- There is a lack of oxygen. These respirators only purify air; they do not supply oxygen. (tanks, pits, storage bins and tunnels are likely to be oxygen deficient).
- There is an unknown contaminant.
- Present contaminants do not have warning properties, e.g., odor, irritant properties or taste.
- The contaminant is extremely toxic (TLV less than 1 ppm). Consult the product label, material safety data sheet (MSDS) or the manufacturer.
- The contaminant level exceeds the ability of the respirator to protect the wearer.

With those severe limitations in mind, evaluate each work situation before choosing a respirator.

Respirators work by using either a chemical or mechanical filtration system. Chemical cartridges use specially treated activated charcoal or other substances that have a high absorption capacity. Mechanical filter elements provide protection against particulate matter such as dust, mists or metal fumes. Mechanical filters work by physically trapping particulate matter. Unlike chemical filters, mechanical filters become more efficient with use, but make it harder to breathe. Therefore, change them when breathing becomes difficult. Change chemical filters periodically or when the odor of the contaminant is detected. The time to change filters depends on contaminant concentration and breathing rate of the user.
Summary
To avoid immediate and long-term respiratory problems, farmers are encouraged to wear protective equipment, such as a respirator, whenever they are exposed to a hazard.
The use of respirators in day-to-day farm operations may be a new practice for many operators. However, respirators can prevent serious respiratory problems.

Sundstrom Safety Inc Respirator Recommendation
Sundstrom’s comfortable half mask and full face mask respirators lets you work longer with less effort and better protection, and at less cost in the farming/ranching and agricultural field.

Ag pack (half mask)
SR 90-2 half mask with, SR 232 OV/SD/CL/HC/HF cartridge (Organic Vapor / Acidic Gas), SR 229 AM/MA cartridge (Ammonia / Methylamine, SR 510 (P100) mechanical particulate filter and pre-filter SR 221.

Farm pack (half mask)
SR 100 half mask with SR 232 OV/SD/CL/HC/HF cartridge (Organic Vapor / Acidic Gas), SR 229 AM/MA cartridge (Ammonia / Methylamine, SR 510 (P100) mechanical particulate filter and pre-filter SR 221.

Farm pack (full face mask)
SR 200 full face mask with SR 232 OV/SD/CL/HC/HF cartridge (Organic Vapor / Acidic Gas), SR 229 AM/MA cartridge (Ammonia / Methylamine, SR 510 (P100) mechanical particulate filter and pre-filter SR 221.

Anhydrous Ammonia Kit (half mask)
Includes SR 100 half mask with SR 229 AM/MA cartridge (Ammonia / Methylamine), SR 510 (P100) mechanical particulate filter and pre-filter SR 221.

Anhydrous Ammonia Kit (full face mask)
Includes SR 200 full face mask with SR 229 AM/MA cartridge (Ammonia / Methylamine), SR 510 (P100) mechanical particulate filter and pre-filter SR 221.