

SAFE FARM

Promoting Agricultural Health and Safety



Lungs Need Protection from Farm Dust

Protective equipment is important when farmers work with pesticides and toxic products. Protective equipment is equally important when farmers work in dusty conditions common to most farms.

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. Long-term exposure to dust can be accompanied by congestion, coughing or wheezing, sensitivity to dust, and frequent respiratory infections such as colds, bronchitis, and pneumonia. Over time, exposure to dust can result in serious respiratory illnesses, such as farmer's lung, asthma, emphysema, chronic bronchitis, and other irreversible, incurable ailments.

According to the Centers for Disease Control and Prevention, crop workers and livestock farmers have elevated mortality for respiratory conditions.

To avoid immediate and long-term respiratory problems, farmers are encouraged to wear protective equipment, such as a respirator, whenever they work in dusty conditions. Respirators may be a good choice if workers are:

- Congested or have breathing problems.
- Generally bothered by dust.
- Concerned about the amount of foreign particles that get into the body.

This publication offers information about respirators used to protect lungs from farm dust. Chemicals such as pesticides, anhydrous ammonia, cleaning solvents, and disinfectants also require the use of protective equipment. Check pesticide applicator training manuals or discuss details with professionals.

How respirators work

Respirators can be one of two types: those that purify existing air, and those that supply air from a tank or other source.

Air-supplied respirators, such as the self-contained breathing apparatus (SCBA) used by firefighters, rarely are used in farming activities. They are relatively expensive and users must be trained.

Many dusty conditions on the farm can be improved with the use of an air-purifying respirator. This device fits over the nose and mouth and uses a filter or cartridge to mechanically remove dust particles from the air as the user breathes. An air-purifying respirator provides protection from dust and mists.

What to look for

There are many styles of respirators on today's market, however, not all are recommended for farming activities. Whether selecting a new respirator or evaluating an existing respirator, always consider several factors.

Testing and approval: All respirators used in farming activities should be approved by the National Institute of Occupational Safety and Health (NIOSH). NIOSH-approved respirators have been tested and meet special federal standards.

Respiratory safety

How much do you know?

1. Farm workers in the United States suffer from serious respiratory illnesses each year. True or false?
2. People who work in agriculture develop immunities to dusty conditions over time. True or false?
3. Wearing a respirator, even if it does not fit correctly, is better than wearing none at all. True or false?
4. Most people cannot tell when a respirator fits properly. True or false?
5. Most respirators used in farming activities supply fresh oxygen. True or false?
6. A respirator with a chemical cartridge is appropriate to use when
 - a) cultivating in the wind.
 - b) removing the chemical for which it has been rated.
 - c) cleaning a hog confinement building.

See answers on back.

Proper use: Many problems result from using an inappropriate respirator. For example, dust masks will not reduce chemical vapors. A respirator approved for use with chemicals may not filter dust.

Always use a respirator appropriate for the task. The specific contaminant for which the respirator is approved will be written on the cartridge filter or instructions with the respirator.

Proper rating: As part of the testing process, a respirator is assigned a “protection factor,” or PF rating, which indicates how well the respirator can perform its job. For farming activities, always use a respirator with a PF rating of 10 or above.

Proper size and fit: The respirator must form a good seal with the wearer’s face so that the respirator can function properly. Dust that slips through a poor seal goes directly to the lungs.

Respirators are available in various sizes and designs to fit most faces. Eyeglasses, clothing, and facial hair, such as beards or sideburns, can interfere with the seal. All respirators must be “fit tested” by safety professionals, using smoke, saccharin, or banana oil while the device is being worn.

Cost: Respirators can be either disposable or non-disposable. Disposable respirators are inexpensive and can be discarded when dirty or when the job is finished, but they can be relatively expensive if protection is required on a regular basis. A better choice is a durable respirator that can be washed and stored after each use.

The user’s physical condition: The user of an air-purifying respirator must be in good physical condition. Since air is drawn through a filtering mechanism, breathing becomes more difficult, and can cause stress for people with medical problems, such as heart conditions or respiratory ailments. Always get a physician’s approval to wear a respirator.

Limitations of respirators

No respirator can solve all air quality problems. Wearing a respirator incorrectly is as dangerous as not wearing a respirator at all. People have a false sense of security when wearing a faulty respirator or one that is inappropriate for the task.

Respirators should **not** be worn when concentrations of dust are in the explosive range. In this situation, users may protect their lungs from dust but they are exposing themselves to other dangers. A general rule is that if it’s too dusty to see your hand at arm’s length, the environment is dusty enough to be explosive.

Another dangerous situation occurs when air-purifying respirators are used in toxic environments. Since air-purifying respirators do not provide oxygen, the air in the working environment must have at least 19.5 percent oxygen. Death can occur in a limited oxygen environment.

Respirators that filter dust cannot protect wearers in toxic chemical environments, such as manure pits, silos, or sludge tanks. Wearing a respirator equipped with a dust filter in these conditions can be fatal.

The use of respirators in day-to-day farm operations may be a new practice for many operators. However, respirators can reduce exposure to farm dust and may prevent serious respiratory problems.

Prepared by Charles V. Schwab, extension safety specialist.

Respiratory safety

What can you do?

You can reduce your exposure to farm dust with these guidelines:

- Make a list of jobs where you might need a respirator.
- Determine the proper respirator for the job. Check the label or with a professional if you have questions.
- Compare the cost of disposable and non-disposable respirators.
- Ask a professional to fit-test your respirator.
- Routinely clean and inspect all non-disposable respirators. Discard disposable ones when dirty.

Answers to quiz:

1-True; 2-False; 3-False; 4-True; 5-False; 6-b.

For more information

Respirators are available from the manufacturer, through mail-order catalogs, local implement dealers, or local farm supply stores.

For more information, contact your county extension office, insurance representative, physician, or hospital clinic.

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Safe Farm is an Iowa State University Extension and Outreach project helping to make Iowa farms a safer place to work and live.

For more safety information, check the web at www.abe.iastate.edu.