



Wheat Dust

Many components of “wheat dust” have long been recognized as contributing or causative factors in respiratory diseases. This is also true of many other agricultural dusts. Unfortunately, when the term wheat dust is used, there is much more to it than the dust from wheat alone.

Variables affecting the makeup of wheat dust

Geographic location in which the grain was raised
Soil type and conditions including temperature and humidity
Harvest conditions
Grain treatment and the type of and length of storage

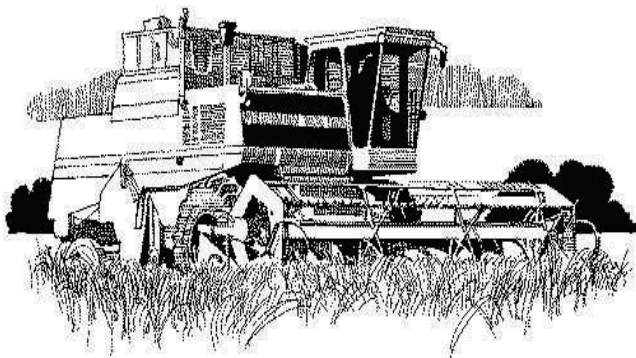
Airborne Hazards

The dust generated by harvest activities is generally in its most natural form. However, dust at harvest can contain significant hazards. These include:

- Fungi
- Bacteria
- Bacterial waste products (endotoxins)
- Pesticide residues
- Insect and mite parts
- Silica
- Dust from the actual grain

Once the grain moves from the field to the elevator or storage bin, the basic components in the dust remain the same but the percentage of each component can change dramatically and thus increase the hazard:

- Depending on moisture level and storage conditions, the concentration of fungal spores in the wheat can increase significantly.
- Populations of grain pests such as mites and beetles can also increase sharply leading to allergic reactions among workers during unloading of the grain



HICAHS researchers have demonstrated that total dust levels (the combination of all wheat dust components) and the number of fungi and bacteria are much higher at elevators as compared to farms when measured across a normal harvest day. However, wide ranges of these contaminants can occur at farms as well as elevators. When working in poorly ventilated areas or performing dusty jobs (grain dumping, etc.), high levels of toxic contaminants are generated regardless of location and the farmers or elevator workers may be exposed to high airborne dust levels.

Health Effects

There is a wide range of health effects associated with breathing wheat dust. There is also a great deal of variation or sensitivity among people exposed. Acute diseases that usually have rapid and sometimes violent onset include:

- Organic Toxic Dust Syndrome (sometimes called grain fever)
- Occupational asthma
- Mucous membrane irritation
- Allergic reactions to fungi, insect parts and feces; and , microbial infections

When people work around wheat dust year after year, this long-term exposure can lead to chronic diseases such as:

- Hypersensitivity pneumonitis (farmer's lung)
- Chronic bronchitis
- Obstructive (emphysema-like) lung disease

Symptoms

Because individuals exhibit varying levels of susceptibility to inhaled wheat dust, response to dust exposure can vary from mild discomfort to life-threatening shock. Symptoms may appear immediately or take years to develop. Symptoms, as a result of exposure, also cover a wide range and include:

- Fever
- Difficulty breathing
- Chronic productive cough
- Decreased lung function

Controlling Dust Exposure

Airborne dust exposure can be controlled in a variety of ways. Avoiding dust by working upwind is often successful but not always practical. Modern, well-maintained cabs on implements usually provide high levels of dust control. However, many situations require work in dusty locations where the only useful protection is a respirator. There are three basic types of respirators with many brands, models and styles within each type.

Air-purifying respirators

- Filter contaminants from the air
- Do not provide oxygen
- Low cost
- Low to moderate level of protection depending on contaminants.
- Unlimited mobility



Supplied-air respirators

- Provide clean air to a mask through a hose
- Do provide oxygen
- Moderate to high cost
- Moderate to high level of protection
- Mobility is limited by hose

Self-contained respirator

- Air supply is carried in a tank by the user
- Provides oxygen
- High cost
- High level of protection
- Heavy, bulky and require extensive training to use

