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Iowa Farmer Today

Safety watch: The right respirator

By Stephanie Leonard Mar 12, 2016

Air-purifying respirators include: N95 filtering facepieces (upper left); half-face respirator with P100 filters (bottom); full-face respirator without cartridges or filters (right).

Photo courtesy Stephanie Leonard

According to the National Institute for Occupational Safety and Health (NIOSH), the federal agency charged with testing, recommending and approving respirators and other protective equipment used in the workplace, about 5 percent of U.S. workers wear respirators at least some of the time while performing their jobs.

Although respirators are widely used in a broad range of work settings, it can be a challenge to find local suppliers with a variety of NIOSH-approved brands and models to compare hands-on when you're looking to purchase the right respirator.

And while local stores may have a limited selection, the many options available from online suppliers can be difficult to narrow down.

A couple weeks ago, I worked with a local farmer to identify a good-fitting respirator to reduce his exposure to airborne dust.

Although he's otherwise in good health, some settings and activities were triggering severe coughing that could last all day. He described the worst scenarios as "closed settings" with dust from livestock and bedding. Working his livestock outside or in mostly open areas wasn't a big problem.

He had already tried what he called "the cheap paper masks" but they weren't helping.

Surgical masks and single-strap "paper masks" — sometimes marketed as nuisance dust masks or safety masks — are commonly available at farm supply, hardware and home improvement stores.

These products should not be confused with true respirators. The fit and filter material for these masks don't meet minimum criteria for respiratory protection worn in the workplace.

When selecting a respirator, the most important considerations are to:

Identify the hazard

A helpful selection tool is available at http://www.gemplers.com/tech/sresp.htm.

Respirators with particulate filters reduce exposures to dust, smoke, mists, mold, sprays or welding fumes. The most common filter options are N95 and P100.

Respirators with P100 filters should be selected in environments where oil mist (e.g., from lubricants, paints, rust inhibitors or dust suppression products) is present.

Respirators that protect against gases and vapors include air-purifying respirators with interchangeable cartridges and atmosphere-supplying respirators.

Air-purifying respirators equipped with replaceable cartridges can protect against low concentrations of some chemical gases and vapors; these include ammonia, organic vapors (for paint or pesticides) or acids (present in some disinfectants and cleaning compounds).

Chemical cartridges must be matched to the specific chemical hazard and changed periodically.

Respirators with chemical cartridges are not protective in environments with oxygen-deficient atmospheres or toxic gases, including hydrogen sulfide and carbon monoxide. In these dangerous scenarios, which can include confined space entry into tanks, manure storage pits, bins or other enclosed areas, the only respirators that are protective are atmosphere-supplying respirators that deliver clean air to the wearer. These include self-contained breathing apparatus (SCBA) and airline respirators.

Check with your doctor

Check with your doctor first if you have health problems, including heart or lung conditions. Wearing a respirator puts additional stress on the respiratory and cardiovascular system.

Physiologic effects can include increased breathing resistance and breathing effort and increased heart rate and blood pressure, particularly during strenuous work.

Having claustrophobia or being unable to detect (smell) hazardous gases that have odor warning properties may preclude the use of some respirators.

Finding your fit

Unless you have access to a supplier, occupational clinic or consultant that has a variety of respirators available to try on and conduct fit-testing, this can take some trial and error.

Many vendors sell respirators through catalogs or online. Options include:

- Gempler's (http://www.gemplers.com/respirators),
- Grainger (http://tinyurl.com/jurjmuq), and

- AgriSafe Network Safety Store (http://www.agrisafe.org/).

Choose from respirators that are “NIOSH-approved.” These will have an approval number that begins with

“TC-xxxx.”

Filtering facepiece respirators — sometimes called disposable dust respirators — do not protect against chemical gases and vapors. The entire facepiece serves as an N95 or P100 particulate filter. The shape and dimensions for these respirators vary, but many manufacturers include at least two size options.

Half-face respirators are used with interchangeable filters or gas cartridges. There are dozens of brands and models from which to select, each with slightly different dimensions, profiles, strap configurations and costs. Most manufacturers provide three size options.

Full-face respirators cover the face from hairline to chin and are also used with interchangeable cartridges and filters. Full-face respirators can provide a better seal and have a higher protection factor (“fit factor”) as a result. Most manufacturers provide these in three size options.

For any close-fitting respirator, there should be no gaps at the nose, chin or jaw line that allow air leaking in or out. If you notice your glasses are fogging while you’re wearing a respirator, it’s an indicator of leakage around the nose.

The farmer I recently worked with wears prescription glasses with bifocals, so we needed to find a particulate respirator that was comfortable, made a good seal and didn’t interfere with the position of his glasses or his vision. Filtering facepiece models were too broad

through the nose, and he preferred the fit and improved seal of a half-face respirator.

We ended up trying several brands and sizes of half-face respirators. A Honeywell/North brand respirator, model 7700 was his best option, in a size medium. He is using it with P100 filters.

We reviewed the proper way to put on and remove the respirator, the inspection points to check each time he uses it and proper care and storage. These include making sure inhalation and exhalation valves are intact, periodically cleaning the facepiece with respirator wipes or mild detergent, and storing it in a clean dry area where it won't be squashed or exposed to heat and sun.

Based on how this test run goes, he will decide if this is a respirator that fits his work practices and needs, or if a different model might be better. Stay tuned!

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