

# Respiratory Protection & PPE for Agricultural Workers during COVID-19

E.J. Sheldon, M.S.  
S.G. Ehlers, Ph.D.  
W. E. Field, Ed.D.

The ongoing COVID-19 pandemic has caused well-publicized shortages of personal protective equipment (PPE) for medical workers. Eye protection, facemasks, and perhaps especially, N-95 particulate respirators are in short supply. While the needs of front-line medical workers understandably receive the most attention, workers in many other critical industries depend on PPE, including respirators, to safely conduct their jobs and to comply with workplace safety standards and laws. This article attempts to distinguish mask and face covering types and applications to the general public, with respect to “slowing the spread”, and critical industry needs for PPE.

## What is an N-95 Respirator?

The most common mask that has some effectiveness against airborne particles is known as the N-95 respirator. To receive the designation as an N-95 respirator, these products must undergo a rigorous testing procedure ([see NIOSH standard](#)) and be certified by the National Institute for Occupational Safety and Health (NIOSH) under 42 CFR Part 84 specifications, to block 95% of very small (0.3 micron) test particles, if properly fitted (FDA). Various manufacturers produce N-95 respirators. NIOSH certified N-95 masks **will** be marked with a NIOSH logo (Figure 1).



Figure 1: Examples of NIOSH-approved N-95 respirators. Consult your doctor before using a respirator if you have cardiac or respiratory issues, and always follow manufacturer’s directions for proper fit. (Purdue University)

## N-95 versus Dust Masks, Cloth Face coverings or Surgical Masks

Dust masks, cloth face coverings or also referred to as “comfort” masks, may be useful in helping prevent an already infected person from spreading a disease pathogen through

sneezing or coughs. In fact, the Centers for Disease Control and Prevention has provided guidance, and many states or local jurisdictions have mandated the wearing of such masks in public spaces to reduce the potential spread of COVID-19. Many volunteer efforts throughout the U.S. are underway to produce homemade face coverings for this purpose, and the CDC has developed recommendations for making these masks ([see CDC DIY Instructions](#)).

While homemade cloth face coverings, surgical masks, or nuisance dust masks are recommended to help prevent the spread of COVID-19, and may make working in dusty environments more comfortable, these items are **NOT** N-95 respirators. Typical surgical masks or dust masks simply do not fit tight enough to the wearer's face to effectively stop inhalation of airborne particles carrying the infectious virus. Any gaps will allow unfiltered, possibly contaminated air, to be inhaled. Also, dust "comfort" masks or surgical masks may not effectively filter small particles, even if fitted well to the wearer (FDA). Perhaps most importantly, these masks have not undergone the required testing procedures, nor the certification process to ensure effectiveness, to be designated as N-95 respirators.

### **Beware of "Fake" N-95 Respirators**

As the COVID-19 pandemic has progressed, numerous internet sites reference homemade N-95 masks, and news reports highlight companies that have begun to manufacture N-95 respirators in response to the demand. These items may use furnace filters, make-up removal pads, and other items to serve as filter material. Some sources use 3-D printed plastic masks to house disposable filters. However, unless a product has undergone the NIOSH certification process and displays the NIOSH logo, it is not an N-95 respirator!

### **If a Respirator is Required, Do Not Substitute a Non-Certified Mask or Face Covering**

OSHA specifies that, "A respirator shall be provided to each employee when equipment is necessary to protect the health of such employee." (OSHA 1910.134(a)(2)). Further, OSHA requires, "The employer shall select a NIOSH-certified respirator. The respirator shall be used in compliance with the conditions of its certification." (OSHA 1910.134(d)(1)(ii)).

As such, in any workplace where respiratory protection is determined to be required due to harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors the employer must provide the appropriate NIOSH-certified respirator for the conditions to be in compliance with the law.

Despite the current shortage of N-95 masks, it is not appropriate for an employer to substitute non-NIOSH certified face coverings in conditions requiring respiratory protection. In addition, the employer cannot force an employee to wear a facemask. While some well-meaning companies and organizations are attempting to reduce their usage of approved respirators to allow more to be available to front-line medical workers, substituting non-certified respirators is not an acceptable practice! In fact, doing so may violate current workplace safety and health regulations.

## **Other Considerations for Respirator Usage**

Respirator use may actually present health hazards to the wearer, as they make breathing more difficult. If the wearer has any type of chronic respiratory or cardiac condition, they should check with a doctor before using any type of respirator! If you are an employer, under current OSHA regulations you cannot assign your employees to wear an N-95 respirator without a physical examination or proper fit testing.

In addition, wearing a respirator for an extended period of time (or not replacing disposable masks regularly) creates a moist “breeding ground” for bacteria. These germs are then recirculated through the wearer’s lungs, possibly increasing the chance for pneumonia or other illnesses.

## **Obtaining PPE and Extending its Use during Shortage**

Industries should expect PPE shortages to continue as the COVID-19 pandemic is brought under control. Those industries designated as “essential critical infrastructure”, including agriculture, continue to operate, and despite shortages are required to provide appropriate PPE to their workers. The Federal Emergency Management Agency (FEMA) released guidelines on April 23 for “Addressing PPE Needs in Non-Healthcare Setting”. Among FEMA’s recommendations are extending the use times of PPE through decontamination and reuse strategies, using best practices to sustain PPE supplies, and working with normal and alternate private sector suppliers to obtain required PPE. A detailed fact sheet can be found [here](#) on the IN-PREPrepared website.

## **Further Information:**

For further information about COVID-19, including its effects on agricultural industries, please visit [www.INPREPrepared.org](http://www.INPREPrepared.org), or contact us at [inprepared@purdue.edu](mailto:inprepared@purdue.edu).

## **Works Cited:**

FEMA: COVID-19 Fact Sheet- [https://extension.purdue.edu/INPREPrepared/wp-content/uploads/2020/04/FEMA\\_FactSheet\\_COVID19\\_NonHealthPPENeed\\_FINAL\\_20200422.pdf](https://extension.purdue.edu/INPREPrepared/wp-content/uploads/2020/04/FEMA_FactSheet_COVID19_NonHealthPPENeed_FINAL_20200422.pdf)

CDC: N-95 Standard [42 CFR Part 84] - <https://www.cdc.gov/niosh/nppt/resources/certpgmspt/pdfs/APR-FFR-03122018-508.pdf>

CDC: Do it Yourself Face Covering Instructions- [https://www.cdc.gov/coronavirus/2019-ncov/downloads/DIY-cloth-face-covering-instructions.pdf?\\_ga=2.177602789.1302176159.1587734924-1429834762.1519063783](https://www.cdc.gov/coronavirus/2019-ncov/downloads/DIY-cloth-face-covering-instructions.pdf?_ga=2.177602789.1302176159.1587734924-1429834762.1519063783)