



## Agricultural Work and the Effects of Poor Air Quality

Over the past few years, California has seen unprecedented levels of intense fires leading to poor air quality across the state. Climate change, droughts, and other factors have caused these fires to become more prevalent and severe. In fires, such as the Thomas fire, agricultural workers, farmers, and ranchers still continued working in these conditions, exposing them and their farm animals to dangerous conditions. Air quality also has worsened with air pollution from factories and other machines, such as cars. Californians experiencing hazardous air quality has brought into question what they should do when conditions are poor or filled with smoke, ash, or other pollutants.

Air quality is affected by many factors— temperature, sunlight, precipitation, pollution (car, power plants, smoking), and natural elements like wildfires or wind. The Environmental Protection Agency (EPA) uses six “criteria” air pollutants to determine air quality— also known as the Air Quality Index (AQI). The AQI is a guideline to explain when precautions should be taken due to the air quality.

With prolonged exposure to poor air quality in the field or outdoors, it is common for people to report one or more of the following symptoms: dryness and irritation of the eyes, nose, throat, and skin, headache, fatigue, shortness of breath, hypersensitivity and allergies, sinus congestion, coughing and sneezing, dizziness, or nausea. Agricultural workers and producers are outside for extended periods of time, making them more at risk to these symptoms and other health risks.

Even healthy people can experience health impacts from polluted air including respiratory irritation or breathing difficulties during exercise or outdoor activities. Your actual risk of adverse effects depends on your current health status, the pollutant type and concentration, and the length of your exposure to the polluted air.



Farmworkers in Oxnard, California, continue to labor underneath dark smoke from the Hill and Woolsey fires burning to the south. Picture from Pacific Standard Magazine.

## Air Quality Index (AQI) Basics

The AQI is an index for reporting daily air quality. It is a way to determine how clean or polluted the air is, and what associated health effects might be a concern. The AQI focuses on health effects that may be experienced within a few hours or days after breathing polluted air. EPA calculates the AQI for six major air pollutants which are ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide.

Think of the AQI as a yardstick that runs from 0 to 500. The higher the AQI value, the greater the level of air pollution and the greater the health concern. For example, an AQI value of 50 represents good air quality with little potential to affect public health, while an AQI value over 300 represents hazardous air quality. AQI values below 100 are generally thought of as satisfactory. When AQI values are above 100, air quality is considered to be unhealthy- at first for certain sensitive groups of people, then for everyone as AQI values increase. Local AQI levels can be found online with a quick search of “air quality in my area”, or on any weather radio station.

Air Quality Index Level of Health Concern	Numerical Value	Meaning
Good	0 to 50	Air pollution poses little or no risk.
Moderate	51 to 100	Air quality is acceptable, however, hypersensitive individuals should consider limiting prolonged outdoor exposure.
Unhealthy for sensitive groups	101 to 150	Children, active adults, and people with respiratory diseases, such as asthma, should limit prolonged outdoor exertion. Healthy individuals may experience irritation and should consider limiting outdoor activity.
Unhealthy	151 to 200	Everyone may start to experience health effects, all individuals should limit outside exposure. Sensitive individuals should avoid outdoor activities. Appropriate masks need be provided by employers.
Very Unhealthy	201 to 300	Healthy individuals will commonly be affected by the air quality, and should limit any activity outside. Individuals with respiratory or heart diseases will have serious symptoms., and should avoid outdoor activity.
Hazardous	301 to 500	Health warnings of emergency conditions. Everyone should avoid activity outdoors entirely.

Those most susceptible to severe health problems from air pollution are individuals with heart diseases, lung diseases such as asthma, pregnant women, older adults, children under age 14, and outdoor workers. When working on a farm, be sure to use an appropriate fitted mask to protect the body and mitigate potential long-term health effects.

All populations of people can experience health impacts from polluted air. Caution must be taken in these conditions, especially when working outdoors or if someone is sensitive to poor air quality. High air pollution levels can cause immediate health problems including: aggravated cardiovascular and respiratory illness, added stress to heart and lungs, and damaged cells in the respiratory system. Working outside in these conditions can have permanent health effects such as accelerated aging of the lungs, loss of lung capacity and function. Workers may also develop diseases such as asthma, bronchitis, emphysema, and possibly cancer.

## Action Steps to Stay Safe in Agricultural Work

If you have to work outdoors in poor air quality conditions, there are some action steps you can take to lessen the effects of the hazardous conditions on your body.

### Use NIOSH/Cal OSHA approved respirators.

- N95 rated air masks are the simplest air masks one can have to protect themselves from poor air quality. Note: To protect against pollutants, N-95 masks must fit well.
- N95 masks are reusable, and higher quality masks can be found at home improvement stores. N95 masks are characterized with their 2 straps for placement. Be sure to pull the top strap so it rests high on your head, and pull the bottom strap over the head and position it around the neck below ears.
- Unfortunately, neither a hospital mask nor a bandana tied over the face prevents noxious air from entering the lungs.



N95 air mask. Photo from [clairfilters.com](http://clairfilters.com).

### Use the AQI to determine if work schedule or staff should be altered.

- Employers MUST provide face masks when AQI levels in the workplace are defined as harmful. Canceling work should be considered when AQI levels are over 200.
- Hypersensitive individuals should consider avoiding work and going outdoors. Consider limiting adolescent's work and school attendance.



Poor air quality due to wildfire—estimated AQI levels around 400. Photo from [theguardian.com](http://theguardian.com).

### Call your doctor if you have concerns about your own health or that of a family member.

- Prolonged exposure to poor air quality can lead to serious health risks, and should not be overlooked.

### Stay cautious.

- Follow advised plans from local health agencies, and stay inside with windows closed during poor air quality conditions. Be aware of farm animal exposure to the air quality.

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