

# Protecting your respiratory tract when handling pesticides

By Stephen H. Futch and Tim Gaver

This is a CEU article that grants one General Standards (CORE) CEU when submitted and approved.

When applying some pesticides, additional protection may be required to protect your respiratory tract. The respiratory tract includes your breathing systems, i.e. nose, mouth, throat and lungs. The respiratory part of your body is much more absorbent to pesticides as compared with your skin or other body parts. If the label directs you to take additional protection of your respiratory tract, you must wear the required protection devices as stated on the label. The label does not prohibit you from wearing additional protection, if you choose, in any pesticide handling operation.

## TYPES OF RESPIRATORS

Pesticide labels can vary greatly in requiring specific types of respirators. However, all respirators used when applying pesticides must be approved by the National Institute of Safety and Health (NIOSH) and Mine Safety Health Administration (MSHA).

Failure to select the proper respirator or to wear it correctly could result in poor protection and greater risk of injury during pesticide handling or application. Prior to using the respira-



tor, the user should make sure it fits the face correctly and that it has been cleaned and properly maintained.

Respirators come in two basic types: air-supplying and air-purifying. The type required will be based upon the area being treated and type of pesticide applied.

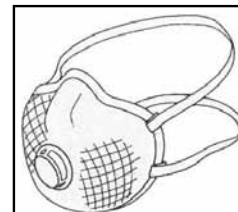
Air-supplying respirators provide clean and uncontaminated air from an independent source. In general, the source of the air is contained in tanks that are similar to those used when scuba diving. The supplied air is limited in quantity and could be used in 30 to 45 minutes, or even quicker in conditions of elevated temperature or when exertion level is high. These types of respirators are generally used when oxygen levels are low or in enclosed areas during fumigation operations.

Air-purifying respirators, on the other hand, remove the contaminants from the air that you will be breathing. These respirators may not provide adequate protection in all situations, especially when using some fumigants, extreme high concentrations of certain pesticides or in conditions where oxygen is low. The air-purifying respirator will remove the contaminants in the

air by filtering or removing them from the air you breathe. These respirators come in three basic types: dust/mist filters, cartridge and canister.

Dust/mist filters will filter out or remove dusts, mists and particles from the air you will be breathing. These filters cover

the nose and mouth and are held in place by two straps to keep the filter fitting tightly around your face. Filters

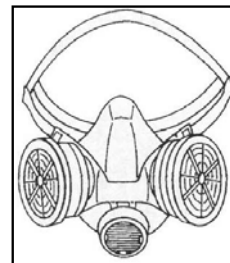


Dust/mist filter respirator

with only one strap are not approved for use by NIOSH or MSHA due to poor fit around the face. Dust/mist-filtering respirators are identified with an approval number of TC-21C that is issued by NIOSH/MSHA.

Cartridge respirators contain devices that remove either dust/mist and/or vapors from the air you will be breathing. In some cases, the device will have a pre-filter that is designed to remove dusts, mists or other particles before the air passes through the vapor-removing cartridge. The cartridge respirators will have an approval number of TC-23C that is issued by NIOSH/MSHA.

Cartridge respirators may also consist of a one-piece unit, whereby the cartridges are permanently attached to the face piece. One-piece respirators are discarded after use, whereas two-piece units will contain removable cartridges that are attached to the body of the respirator, allowing them to be removed prior to cleaning the respirator body and then reused.



Cartridge respirator

The removable cartridges and pre-filters are replaced when they: 1) become contaminated, 2) you find it difficult to breathe, or 3) you can smell the pesticide when wearing the unit.

The canister respirator will contain both a dust/mist-filtering portion as well as vapor-removing parts. Canister-type devices have also been referred to as gas masks. The filtering capacity of a canister respirator is usually greater than a cartridge

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respirator, as the size and filtering area are much greater. Canister respirators will have an NIOSH/MSHA approval number of 14G.

When wearing any type of respirator, if it becomes more difficult to breathe, replace the filtering devices as they become clogged with particles that are being removed from the air. The useful life of most devices will vary with use and environmental conditions. Under most conditions, the useful life of the cartridges will not exceed eight hours of continual use. However, if the conditions are dusty, dirty or if the filter becomes soaked with pesticides, the useful life will be shorter and warrant immediate replacement.

All air-purifying respirators draw the contaminated air through filters to remove the contaminants. Most filters will rely on the user's lung power to pull the air through the filtering devices. For individuals with respiratory problems like colds, allergies or other issues, it will be difficult to wear these devices as strong lung capacity is needed to draw the air through the filtering devices.

## PROPER WEAR

For some pesticides, medical certification is required to ensure that the user is healthy enough to wear the respirator. So, before using a respirator, individuals should have a medical examination to ensure that they are physically fit to wear the respirator. If users ever develop difficulty breathing while wearing the respirator, they should seek medical attention to ensure that a medical condition does not exist that would prohibit them from using the respirator safely and effectively.

Most respirators must fit tightly around the face to work properly and are generally referred to as face-sealing respirators. The tight seal around the face prevents the contaminated air from entering around the edges. Individuals with facial hair or beards will not be able to wear this type of face-sealing respirator as a tight seal will not be formed around the face and surface of the respirator, prohibiting proper air filtering.

Some pesticide labels require fit-testing certification, so each respirator must be fitted to each wearer due to varying facial characteristics. Respirators are not interchangeable among users.

To verify that the respirator is properly fitting, users can perform two types of tests: a fit test and a fit check. These simple tests ensure that the user is being properly protected by the specific respirator being worn.

The fit test should be conducted

# Challenges to replanting citrus groves addressed by CRDF

By Harold Browning



There is mixed enthusiasm in Florida for replanting groves that have suffered debilitating losses from canker and HLB. Methods must be developed and field-tested to protect young trees during the first five to six years following planting, when they are most vulnerable to infection by the HLB bacterium carried by Asian citrus psyllid (ACP). At the same time, horticultural practices must be enhanced to provide for early productivity and yield quality so that groves will provide financial return before being impacted by disease infection.

Research is addressing ACP in mature citrus trees, and some degree of success can be attained through vigilant scouting and application of pesticides. Additional benefit has been derived through cooperation among growers via the Citrus Health Management Areas (CHMAs). Despite these efforts and long-term research to develop disease-resistant plants, we do not have tools available today to fully protect young citrus trees from disease infection, particularly from HLB.

A number of innovative and optimistic citrus growers have undertaken new citrus plantings in the past five years, prepared to incorporate all available tools to be successful in getting trees to productive age. These plantings begin with clean nursery stock and are utilizing intensive practices of fertilization, pest and disease scouting, pesticidal applications, and aggressively roguing infected trees as soon as they are identified. These innovators have adopted all available information and technology, but many are faced with increasing infection levels as young trees grow through the first five years. Panel discussions at recent citrus educational events highlight experiences of growers who are replanting, and convey uncertainty about success in the face of increasing HLB presence.

Research supported by the industry through CRDF is addressing several areas that are vital to success with new plantings, and results are forthcoming in the following areas:

- Expand the availability of soil-applied insecticides to provide season-long psyllid control as trees progress from planting through the most vulnerable stages of growth in years 1-6. The CRDF Commercial Product Development Committee is leading an effort to expand labels for effective materials to allow for increased control as trees advance to produce fruit in years 3-6.
- Improve monitoring for ACP and HLB, including new diagnostics that will locate early infection and allow inoculum management in new plantings.
- Develop psyllid management in young plantings that incorporates attractants, repellents, and other tools complementary to insecticidal suppression.
- Continue to foster expansion of CHMAs to optimize psyllid control across broader areas.
- Evaluate alternative citrus production systems that promise to shorten time to productive yield in new plantings with higher density and intensive irrigation/fertigation practices.
- Manage HLB and other stresses within the context of overall citrus production, focusing on maintenance of long-term health and productivity of the trees.

Florida citrus growers are battling HLB, and many are delaying replanting activities until proven methods emerge that will protect young trees. Improved ability to plant resets and new plantings will significantly restore confidence in the citrus industry to overcome the HLB impacts and to look forward to renewing the production levels necessary to sustain the industry. Ongoing progress with these and other HLB research areas is provided by individual project leaders at frequent grower meetings and Extension events and can be found at our website [www.citrusrdf.org](http://www.citrusrdf.org)

*Harold Browning is Chief Operations Officer of CRDF. The foundation is charged with funding citrus research and getting the results of that research to use in the grove.*



Column sponsored by the Citrus Research and Development Foundation

prior to wearing the respirator for the first time and then periodically thereafter. The fit test procedure is a program approved by NIOSH and the Occupational Safety and Health Administration (OSHA) and has specific operation guidelines. The fit test determines if the wearer can detect a substance by irritation or odor, or assay the actual amount/concentration of the test substance that enters the face piece.

The fit check is a check that is usually done on the spot to verify that the respirator is still working correctly. This test should be conducted each time you wear any face-sealing respirator. The fit check can be conducted by two methods. The first method involves closing off the air inlet of the respirator with your hand, then inhaling so that the face piece collapses slightly, and then holding your breath for 10 seconds. If during this test the face piece remains slightly collapsed for the 10-second period, it is working correctly. However, if the face piece does not remain slightly collapsed for the 10-second period and air movement into the face piece is detected, then it is not working adequately enough to properly protect the user. The second method is to exhale while wearing the device by placing your hand over the exhalation port. If pressure builds up inside the respirator without evidence of leakage, the respirator is working correctly.

Detecting an odor or taste, or experiencing sensory irritation while wearing the respirator would indicate that the device is not fitted or working properly and should be immediately checked to ensure proper filtering of the air entering the respirator.

Loose-fitting respirators are a type of respirator powered by a constant pump in which air is forced through a cartridge or canister into a loose-fitting helmet or hood-head covering. The constant outward movement of air from the respirator prevents contaminants from entering the headpiece. These loose-fitting respirators may provide some advantages when working in situations where heat stress is a major concern, as the movement of air provides some cooling to the face, head and neck.

Proper selection, use and care of pesticide respirators will ensure the safety of the user and provide for optimum protection from airborne contaminants.

Source: *Applying Pesticides Correctly*, UF IFAS, Gainesville, FL

Stephen H. Futch is an Extension agent at the Citrus Research and Education Center, Lake Alfred; Tim Gaver is an Extension agent at the St. Lucie County Extension Service, Fort Pierce.

### 'Protecting your respiratory tract when handling pesticides' test

To receive one CORE continuing education unit (CEU), read "**Protecting your respiratory tract when handling pesticides**" in this issue of *Citrus Industry* magazine. Answer the 20 questions on the magazine's website ([www.citrusindustry.net](http://www.citrusindustry.net)) or mail the answers and application information to the address at the bottom of this form. The article and test set will be valid for up to one year from the publication date. After one year, this test will no longer provide a CEU.

1. *The primary area you are trying to protect when wearing a respirator is the lungs.* T F
2. *The pesticide label prohibits you from wearing additional protection during handling or application of pesticides.* T F
3. *The two federal agencies that regulate the type of respirators to be worn are USDA and MSHA.* T F
4. *Prior to using a respirator, you should make sure it fits your face correctly.* T F
5. *Respirators come in two main types: air-supplying and air-eliminating devices.* T F
6. *Air-supplying respirators provide clean and uncontaminated air from an independent source.* T F
7. *Air-purifying respirators remove the contaminants from the air you will be breathing.* T F
8. *Dust/mist-filtering respirators with a single strap will provide adequate filtering in approved situations.* T F
9. *Dust/mist respirators have an approval number of TC-23C.* T F
10. *Cartridge respirators contain devices that remove dusts/mists and/or vapors from the air you will be breathing.* T F
11. *Cartridge respirators will usually contain a pre-filter that is designed to remove dust or mist prior to filtering the air.* T F
12. *Cartridge respirators are available in only one version with a removable filter.* T F
13. *You will find it difficult to breathe while wearing a respirator in all situations.* T F
14. *Canister-type respirators have also been referred to as gas masks.* T F
15. *All air-purifying respirators draw air through filters to remove the contaminants from the air.* T F
16. *Users of respirators should have a medical checkup prior to wearing respirators.* T F
17. *Respirators are interchangeable among users.* T F
18. *A fit check is usually done on the spot to verify if the respirator is working correctly.* T F
19. *Detecting an odor or taste while wearing a respirator would indicate that the device is not working correctly.* T F
20. *Loose-fitting respirators are powered by a constant pump to force air into the helmet or hood covering.* T F

#### Pesticide Applicator CEU Form

First Name: \_\_\_\_\_ Last Name: \_\_\_\_\_

Email: \_\_\_\_\_

Pesticide License Number: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Please mail the answer sheet or a copy of the form to: Steve Futch, Citrus Research & Education Center, 700 Experiment Station Road, Lake Alfred, FL 33850

If you have questions regarding this form, test or CEUs, email Steve Futch at [shf@ufl.edu](mailto:shf@ufl.edu) or call (863) 956-8644.

