Unit 7: Safety Equipment

Learning Objectives

After reading this unit, the reader will be able to:

- Choose the most appropriate equipment to perform safe and effective fumigations.
- Test, fit, maintain, and use a respirator properly.
- Recognize danger signals of respiratory equipment failure.
- Select and operate gas detection devices properly.

Fumigants are some of the most toxic pesticides available. Even moderate exposure can be lethal to you and others. Proper use of safety equipment is critical.

This unit describes some of the basic safety equipment used in food and stored commodity fumigation. By reading it, you will learn how these devices work and how to use them properly. When safety equipment fails, consequences can be deadly. This unit will help you recognize danger signals of equipment failure. You will also learn how to prevent these failures by properly selecting and maintaining equipment.

Terms To Know

Aerate – To replace fumigant-containing air or water with fresh air and/or water that contains little or no fumigant. Aeration must follow all fumigation operations.

Air-Purifying Respirator – A device that uses special canisters to remove particles and toxic vapors from the air. The canisters fit on a facepiece and are specific for one type fumigant. Air-purifying respirators are also called gas mask/canister combinations.

Ambient Air Analyzer – A gas detection device that measures the amount of infrared light absorbed by a gas at a selected wavelength. This tells you what gas is present and its concentration.

Antidote – A remedy that may counteract the effects of a pesticide.

Atmosphere – The body of air that surrounds a given area. Breathable atmosphere consists largely of nitrogen and oxygen with small amounts of carbon dioxide and other gases.

Atmosphere-Supplying Respirator – A device that draws air from outside a fumigation area or uses canisters of pressurized air to supply a worker with breathable air.

Calibrate – To measure and adjust a gas detector so that it reads accurately for the fumigant you use.

Exposure – When a person or organism comes in contact with a pesticide by inhalation, ingestion, skin contact, or any other method.

Facepiece – The part of a respirator that fits over your nose, mouth, face, or entire head.

Fumiscope® – A type of thermal conductivity analyzer (TCA) that measures the concentration of specific fumigants. It is lightweight, portable, and operates on 115 volt AC (alternating current) or battery power.

Material Safety Data Sheet (MSDS) – A printed report that details information on the fumigant manufacturer, identity of hazardous ingredients, physical and chemical characteristics, fire and explosion hazard data, reactivity data, precautions for safe handling and use, and control measures.

Neutralize – To counteract the effect of a harmful substance such as a pesticide.

Permissible Exposure Limit (PEL) – An OSHA standard that designates the maximum exposure permitted as an 8-hour time-weighted average (TWA).

Personal Protective Equipment (PPE) – Clothing or devices used to protect the human body from exposure to pesticides and pesticide residues.

PPM (Parts Per Million) – The number of parts of a substance in one million parts of another substance. For example, if a gas detector reads “5 ppm,” it means that there are five parts of fumigant to every one million parts of air.

Respirator – A device that protects the respiratory tract from irritating and poisonous gases, fumes, smokes, and dusts. Respirators may or may not have equipment that supplies oxygen or clean air.

Self-Contained Breathing Apparatus (SCBA) – A type of respirator that supplies fresh air from an outside or portable source. Air enters a mask that tightly covers the entire face.

Supplied-Air Respirator (SAR) – A device that supplies air from a compressed air tank that is located outside of the fumigation area.

Thermal Conductivity Analyzer (TCA) – An instrument designed to measure the concentration of fumigant gases within a chamber or other enclosure during fumigation.

Threshold Limit Value-Short Term Exposure Limit (TLV-STEL) – The concentration of fumigant to which most workers can be exposed continuously for a short period without suffering from:

- Irritation
- Chronic or irreversible tissue damage, or
- Narcosis (drunkenness) that may increase the chance of accident or injury
- Exposures to concentrations at the STEL should not be longer than 15 minutes and should not occur more than four times per day. The STEL is expressed in parts per million (ppm) or milligrams per cubic meter (mg/m^3).

Threshold Limit Value-Time Weighted Average (TLV-TWA) – The average concentration of fumigant to which most workers may be repeatedly exposed 8 hours a day, 40 hours a week without adverse effect. The TLV-TWA is expressed in parts per million (ppm) or milligrams per cubic meter (mg/m^3).

Volatility – The ability of a substance to turn into a gas (vapor) at relatively low temperatures.

Respiratory Equipment

A respirator is as important to a fumigator as a parachute is to a paratrooper. Both are critical to on-the-job safety. If either device is not regularly inspected, maintained, and used correctly, results could be deadly. Remember that fumigants are some of the most toxic pesticides. Breathing even small amounts of some chemicals can be fatal.

Training is crucial for the safe and effective use of respirators. To use respirators during fumigation, you must establish a formal respiratory protection program. Your program must meet all of the requirements outlined in the Occupational Safety and Health Administration (OSHA) Respiratory Protection Standard (29 CFR 1910.134). These include written operating procedures for the maintenance, cleaning, and storage of the respiratory equipment. Your program must also contain guidelines for educating respirator users. The information in this manual is not a substitute for the OSHA requirement.

There are two main types of respirators used in fumigation: atmosphere-supplying respirators and air-purifying respirators.

NOTE: All respirators used by fumigant applicators must be full-face gas masks approved by the NIOSH/MSHA (National Institute of Safety and Health/Mine Safety Health Administration).

Atmosphere-Supplying Respirators

Atmosphere-supplying respirators draw air from outside a fumigation area or use canisters of pressurized air to supply a worker with breathable air.

Fumigators use two main types of atmosphere-supplying respirators: self-contained breathing apparatus (SCBA) and supplied-air respirators (SAR).

Self-Contained Breathing Apparatus (SCBA)

A self-contained breathing apparatus (SCBA) consists of a full-face mask attached to a tank of air carried on the back of the worker. The cylinder of compressed air supplies air to a

regulator. The regulator reduces the pressure and delivers breathable air to the facepiece.

Self-contained breathing apparatus (SCBA)

Because you carry your air supply, you do not need to be connected to a stationary source of breathable air. This gives you the mobility of a canister mask (described later in this unit) and does not restrict movement. One person can carry enough air for up to 60 minutes. However, the weight and bulk of a SCBA often makes strenuous work difficult.

Do not confuse SCBA with SCUBA (self-contained underwater breathing apparatus). These systems are very different. You cannot interchange their uses.

There are two types of SCBA respirators: a demand regulator and a positive pressure regulator.

Demand Regulator

A demand or negative pressure regulator supplies air to the facepiece when the wearer inhales. This creates a vacuum. Facepieces must fit snugly or contaminated air may leak in.

Positive Pressure Regulator

A positive pressure regulator allows continuous airflow into the facepiece. A pump supplies air on demand when you inhale. The constant positive pressure in the facepiece forces any leaks out of the facepiece.

Supplied-Air Respirators (SAR)

Like SCBAs, supplied-air respirators are equipped with a full-face mask that delivers air to the fumigator from a compressed air tank. With supplied-air respirators, however, the air tank is located outside the fumigation area.

The most common supplied-air respirator used by fumigators is the "airline respirator." Airline respirators supply compressed air from a stationary source through a long hose. Airline respirators have demand, pressure-demand, or continuous-flow designs. Air is supplied to a facepiece, helmet, hood, or a complete suit depending on the level of protection needed.

The demand or pressure-demand airline respirator operates much like the demand SCBA respirator. The difference is that the airline system supplies air through a hose connected to a stationary air source. The fumigator carries the SCBA air supply.

Continuous-flow airline respirators provide breathing air continuously, rather than on demand. These are much like the positive pressure SCBA respirators. Instead of a regulator, however, these respirators have an airflow valve that partially controls the airflow. In addition, air is supplied by a stationary source, whereas SCBA air tanks are portable.

Airline respirator

There are several advantages to airline respirators. Unlike SCBA respirators, airline respirators provide long, continuous use. They are lightweight and offer minimal breathing resistance and discomfort. Airline respirators also have a moderate initial cost and a low operating cost.

Unfortunately, there are drawbacks to airline respirators as well. For example, if something cuts, burns, kinks, or crushes the hose, the wearer has no air. Also, compressors may fail or the storage tank may become empty. For these situations, there are airline respirators with auxiliary air supplies. Airline respirators can also restrict movement. Because the wearer is attached to a long hose, there are limits to how far and in what direction he or she can move.

Air-Purifying Respirators

Air-purifying respirators or "gas mask/canister combinations" remove particles and toxic vapors from the air. When you breathe

in, you draw air from outside the respirator, through air-purifying canisters or cartridges, and into the mask. The cartridges or canisters absorb impurities as the air passes through. Like SCBAs and SARs, gas mask/canister combinations are full-face gas masks.

Canister respirator

Gas mask/canister combinations are approved only for specific fumigants. There are many different types of canisters. Each one is color coded with stripes. The stripes indicate limitations and approved uses for quick and easy recognition. For example, a gray stripe around the top of a canister indicates the presence of a filter that removes dust and other particles. Other color combinations identify canisters for specific fumigants. Before using any air-purifying respirator, make sure the same manufacturer that makes your mask also produces the canister. If not, the canister may not fit snugly and the mask may leak.

How long a canister will last depends on several things:

- The type of canister
- The size of the canister
- The type and concentration of gas in the surrounding air
- The length of exposure
- The rate of breathing
- Whether there is more than one gas present, and
- The temperature and humidity at the time of use

Never use a canister after the expiration date. An expiration date is usually listed somewhere on the canister. Several signs will alert you to an expiring canister. Feel the canister regularly. If it is hot to the touch, you may be in an area richer in fumigant gas than is recommended. An expired canister may feel cool to the touch. If you find it hard to breathe, detect an odor, taste something strange, or experience eye or nose irritation, your canister may be expiring or your mask may be leaking. Return to fresh air immediately. If you start to feel ill (ex., nauseous, dizzy, fatigued, etc.), get medical help right away.

How It Works

When properly assembled and fitted, the gas mask/canister combination is a compact air-purifying unit. It protects against the gases or vapors listed on the canister label. During inhalation, air enters the canister. The canister then physically or chemically purifies the air, neutralizing or absorbing harmful gases and vapors. The purified air then passes through corrugated rubber tubing into the molded channels of the facepiece. Some of these channels direct the purified air to the lenses to reduce fogging.

When you exhale, air expels from the facepiece through a valve designed to permit normal conversation. This valve also serves as a drain for moisture produced by breathing. An inhalation valve at the bottom of the canister prevents the exhaled air from passing out through the canister.

Always read the label information to determine which type of respirator to use. Wearing the proper PPE will protect you and your co-workers. It is also the law.

Care of Respiratory Equipment

All applicators should have their own respirator and canister. Do not share your canisters with others. In fact, it is best if you do not reuse canisters at all. If you must reuse a canister, keep a written record of the date used, length of time used, and gas concentration. Destroy or mutilate the tops of canisters that are no longer usable. Never reuse a canister if it has been used in an emergency.

Clean and disinfect your respiratory mask after each day's use and at least once a month. To sanitize masks, prepare a solution of cleaner-sanitizer (available through your respiratory protection supplier) and warm water. Immerse the mask in this solution. Scrub the interior and exterior of the mask with a sponge. Rinse the mask with warm water and air dry. If you are not able to sanitize the mask immediately, wipe out the interior with a clean cloth, preferably one saturated with isopropyl alcohol.

During cleaning, inspect the mask. Look for any loose connections and rubber deterioration.

Check the integrity of the facepiece seal. Keep a record of all cleanings and inspections.

After cleaning and inspection, place the mask in its carrying case to protect it against dust, sunlight, heat, extreme cold, moisture, or damaging chemicals.

If your respirator needs repairs, be sure to use parts designed for that particular respirator. Only experienced persons should repair a respirator.

Fitting and Testing the Respirator

To obtain a firm and comfortable fit of your face mask, adjust the headbands in this order:

1. Make sure the straps lie flat against your head.
2. Tighten the lower or neck straps.
3. Tighten the side straps.
4. Place both hands on the headband pad and push it toward the neck.
5. Repeat steps one and two.
6. Tighten the forehead or front strap a few notches.

The mask should feel comfortable, while forming a tight seal against your face. Facial hair will prevent a tight seal. Workers with beards and/or large mustaches must shave. OSHA requires that respirators fit properly and that you test their facepiece-to-face seal. There are three methods currently acceptable for fit testing: the taste test, the odorous vapor test, and the irritant smoke test. All three tests require you to be exposed to the test agent before putting on the respirator. This ensures that you can detect the test agent.

Taste Test – First, put on the respirator and adjust it until the fit seems tight. Then, place an enclosure over your head and shoulders. Have someone spray a test agent, usually saccharin, inside the enclosure. If you note a sweet taste, the fit is poor and needs adjustment.

Odorous Vapor Test – With this test, banana oil is the test agent. Again, put on the respirator and adjust it until the fit seems tight. In a separate room, have someone release the test agent. If you cannot smell the chemical, the fit is fine.

Irritant Smoke Test – With the respirator on and fitted, have someone direct an irritant smoke such as stannic chloride towards the respirator. These chemicals produce a strong, involuntary reaction, usually coughing or sneezing. If you do not react, your respirator fit is good.

Once you find a respirator with a good fit, testing is not over. You will also need to check the respirator each time you wear it. Here are two quick field tests.

Negative Pressure Test – This test checks gas masks for a tight fit. First, pinch off the breathing tube or close off the inlet of the canister with the palm of your hand. Then, inhale to create "negative pressure." The facepiece should collapse. Then hold your breath for 10 seconds. A respirator with a tight seal will remain collapsed while you hold your breath. If it is leaking, adjust the head straps and repeat the test.

Positive Pressure Test – This test is usually included in the manufacturer's instructions. First, place the palm of your hand or thumb over the valve guard and press lightly. Then, exhale gently into the respirator causing "positive pressure" inside the facepiece. If you do not feel any air leaking out of the facepiece, the respirator fits properly. If it is leaking, adjust the straps and test again. If the leak persists, inspect the respirator for problems. Check the hoses and connections to make sure they are tight and in good condition. A new rubber washer for the mask hose is supplied with each new canister. This washer must be in place when attaching the hose to the canister. Otherwise, vapors can enter through the mask hose. Be sure to check for this washer. If the leak still exists, try installing a new corrugated breathing tube. If this takes care of the leak, destroy the defective breathing tube. If, after removing your hand from the canister inlet, you find you cannot breathe, the canister has a blockage. Destroy and replace the canister. If the respirator is an air-supply type, check the facepiece and breathing tube. If the respirator is a SCBA, check the air tank for amount of air, leaks, and valve efficiency. For SARs, test the valves, connections, and hoses.

Use of Respiratory Equipment

Your respirator should be ready for use at all times. When it is not in use, have it on hand for emergencies. Keep the following list nearby. It will help you to inspect and use your mask properly.

- First, monitor the air quality. If the air contains less than 19.5 percent oxygen, it is deficient. Use an air-supplying respirator and not a gas mask/canister combination. When in doubt, always use an air-supplying respirator.
- If you use a gas mask/canister combination, check the canister for an expiration date. If canisters are used more than once, be sure enough time remains. When in doubt, use a new canister.
- Select the proper canister for the fumigant you plan to use. The canister label will indicate for which fumigants it is approved. Also, make sure the same manufacturer that makes your mask produces the canister. If not, the canister may be loose and the mask may leak.
- If you use a new canister, install the new washer that comes with it.
- Remove the tape that covers the intake port on the bottom of the canister.
- Connect the mask and canister.
- Put the mask on while you are in fresh air.
- Check for proper fit and leaks.
- Check the time. Note when you should be out of the fumigated area.
- Enter the contaminated area slowly. Return to fresh air immediately if you notice irritating gases, odors, or symptoms of distress.

After completing the job:

- Clean and inspect the respirator.
- Record the date of cleaning. If you plan to reuse the canister, record how long you used it. Also, indicate the fumigant and its concentration.
- If you used all of the canister's time, mutilate the top so that it cannot be reused. Discard the canister.
- Return the respirator to its carrying case. Place both items in a proper storage area.

Gas Detection Equipment

Gas detectors monitor and record gas concentrations before, during, and after treatment. They are a part of every fumigator's operational and safety equipment. You can use detectors to eliminate some of the common hazards associated with fumigation. Use them to:

- Indicate fumigant levels during treatment
- Detect excessive leaks in a building or poor tarp seals, and
- Determine the dosage requirements for future fumigation

Detectors also measure the success of aeration by monitoring the presence or absence of fumigant vapors.

Be sure the accuracy and range of your detector is suitable for the fumigant you plan to use. Some detectors are more sensitive than others are. Calibrate your detector for each fumigant you use. Be sure you know how to read it.

There are several gas detectors from which to choose. The following are some of the most common used in fumigation.

Halide Gas Detectors

The halide gas detector indicates the presence and approximate concentration of halide gases. It is most commonly used to measure levels of methyl bromide. It reliably measures gas concentrations of 50 parts per million (ppm) or greater.

Halide detectors consist of:

- A fuel tank
- A valve assembly (to regulate fuel flow)
- A burner head assembly (where the fuel and air mix and unite), and
- The reaction place or cone assembly (where the visible flame reacts to halogen gases)

An attached search hose feeds the air mixture to the burner head assembly for testing. The fuels used include kerosene, alcohol, acetylene, and propane. These are available at refrigeration supply dealers.

To operate a halide detector, hold a lit match in the window opening of the burner tube. Turn the valve slowly to the left. After the copper plate or cone turns red, adjust the flame to the smallest size to maintain that color. The detector is now ready to test the air. Hold the open end of the search hose on, in, or near the article or area to be tested. As air passes over the heated plate or cone, the flame color will change if a halogen gas is present. The color and intensity of the flame indicates the concentration of the gas. A color chart with corresponding gas concentrations comes with each detector.

NOTE: If you use a halide detector at night, the flame will have a bluish cast. You must consider this when reading the results.

Unfortunately, no halide detectors are accurate for determining exactly how much gas is present. They will only give you an estimate.

Because halide detectors have an open flame, you must adhere to all safety precautions. Even when the detector is not in operation, do not store it in a frequently inhabited room. The fuel is a flammable gas under pressure and may explode. Do not use halide detectors in the presence of flammable or explosive gases such as gasoline vapors. Do not use halide detectors in mills, elevators, or other enclosures where there is a possibility of a dust explosion. Always read the label to determine the flammability of the product you are using.

Halide detectors need little maintenance. The burner head orifice is very small. Prevent dust and other debris from clogging it. Occasionally, you will need to replace the reaction plate or cone.

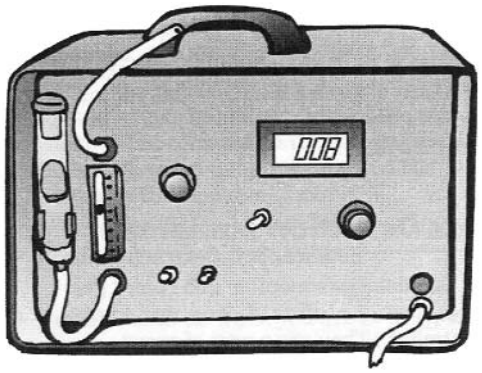
The halide gas detector has been used for many years. It is an operational as well as a safety device. By detecting leaks, it can help you to reduce harmful gas levels outside the treatment area. This will increase the safety and efficacy of your operation. As a precaution, use a halide detector regularly in rooms that house fumigation chambers. This is particularly important when the building also contains offices or other work areas.

NOTE: Do NOT use a halide detector to determine whether fumigant levels are safe for reentry. While the halide detector is useful for detecting low levels of halogenated fumigants, it should NOT be used to detect harmful concentrations of these fumigants. The reentry threshold concentrations for a number of fumigants are lower than the detection limit of the halide detector.

Thermal Conductivity Analyzers

Thermal conductivity analyzers (TCAs) measure the concentration of fumigant gases within a chamber or other enclosure during fumigation. Several types of TCAs are available.

The Fumiscope® is one of the most common TCAs. It is primarily used to measure methyl bromide concentrations. The Fumiscope® is lightweight, portable, and comes in a compact cabinet. It operates on 115 volt AC (alternating current) or battery power. In a Fumiscope®, electrical currents pass through a wire exposed to the sampled air. The temperature of the wire is affected by the composition of the air around it. The hotter the wire, the higher the fumigant concentration. The fumigant concentration is displayed on the Fumiscope® meter.



Fumiscope®

When using TCAs, keep in mind that most of them are sensitive to several gases, not just the one for which you are testing. For a true reading, you must eliminate other gases. For example, carbon dioxide (CO_2) may occasionally be a problem. If a prefumigation test indicates high levels of CO_2, place a tube of sorbing material such as sodium hydrate in the sampling line. It will absorb CO_2, allowing the TCA to give you a more accurate reading.

When you run long sample lines into the fumigated area, use a small pump to draw air from the test point to the end of the line. This speeds up the readings.

NOTE: Like the halide detector, TCAs should NOT be used to determine whether fumigant levels are safe for reentry. They cannot measure gas concentrations below 5 ppm.

Glass Detector Tubes

Glass detector tubes or "color diffusion detector tubes" are another gas detection option. Unlike other detectors, glass tubes are disposable. You can only use them once. Glass detector tubes are often more sensitive and more specific than halide detectors and TCAs. They can detect specific fumigants at lower levels than other gas detectors.

Glass detector tube

Glass detector tubes are "fumigant specific." That means you will need to purchase a different set of tubes for each type of fumigant you use. Their operation is simple. Place one tube in the area you wish to test. Break the seal. A sample pump will draw a measured amount of air through the tube. A color reaction will occur indicating the fumigant concentration. A color chart with corresponding concentrations is printed directly on the tube.

Detector tubes are available for many fumigant gases. Both high-range and low-range tubes are available for some fumigants. Use the high-range tubes to determine gas concentrations during fumigation. Use the low-range tubes to assure safe working conditions after aeration and before reentry.

Ambient Air Analyzers

Some ambient air analyzers or "infrared detection systems" use infrared spectrophotometers to detect and measure gas concentrations. This is how they work. When infrared radiation strikes a gas, certain wavelengths of the radiation are absorbed. The spectrophotometer measures this absorption. The amount of radiation absorbed determines the gas concentration. Most ambient air analyzers can be calibrated at the factory to detect a single gas. Others are equipped with a fixed infrared filter.

Portable units weigh about 18 pounds. They are equipped with both AC (alternating current) and battery power. Each unit has two scales. The lower scale is accurate from 0 to 15 ppm. Use it to check fumigation sites before reentry. The upper scale functions as a leak detector during fumigation. It detects concentrations from 0 to 150 ppm.

Gas Analyzers

Gas analyzers detect leaks during fumigation. They also determine if a site is ready for reentry. Several models are available. The most popular are lightweight and battery powered. Most are designed to monitor concentrations of a particular gas. One model uses a pump to draw an air sample through a tiny furnace. Any fumigant present passes through a sensor that detects how much gas is present. Readings are given in parts per million (ppm).

Other Protective Equipment

Whenever possible, provide two-way radio communication between workers applying fumigants and those outside. Also, keep on hand:

- An emergency air-supplying respirator, especially if canister-type respirators are being used
- Antidotes where applicable
- A safety harness or rescue belt, and
- Basic first aid equipment

Test Your Knowledge

Q. Name the two types of respirators most often used by fumigators. Describe the difference between them.

A. Atmosphere-supplying respirators draw air from outside a fumigation area or use canisters of pressurized air to supply a worker with breathable air.

Air-purifying respirators (gas mask/canister combinations) use special canisters to remove particles and toxic vapors from the fumigated air.

Q. Name two types of atmosphere-supplying respirators. Explain the advantages and disadvantages of each one.

A. A self-contained breathing apparatus (SCBA) gives the operator greater mobility but offers a limited amount of air. One tank of air usually lasts about one hour. The weight and bulk of a SCBA apparatus can also make strenuous work difficult.

A supplied-air respirator (SAR), such as an airline respirator, has the advantages of longer continuous use and a lighter weight. However, because you are connected to a stationary source, movement may be restricted. In addition, if something cuts, burns, kinks, or crushes the hose, the wearer has no air.

Q. What does the stripe around the top of an air-purifying canister indicate?

A. The type of material the filter in the canister will remove from the air.

Q. What can the temperature of an air-purifying canister tell you?

A. If the canister is hot to the touch, you may be in an atmosphere richer in fumigant gas than is recommended. If the canister feels cool, it may be completely expired (no longer able to purify the air).

Q. If an air-purifying canister has expired, what should you do to it before you throw it away?

A. Destroy or mutilate the top so that it is no longer usable.

Q. Describe the procedure for fitting a respirator mask.

A.
1. Make sure straps lie flat.
2. Tighten neck straps.
3. Tighten side straps.
4. Push headband pad downward.
5. Repeat steps one and two.
6. Tighten front strap a few notches.

Q. Describe two "quick" ways you can make sure a respirator facepiece fits properly.

A.
1. Pinch off the breathing tube and inhale so the facepiece collapses. Hold your breath for 10 seconds. The facepiece should stay collapsed for this time. If it does not, the mask does not fit properly and fumigant may leak in.
2. Press your thumb over the valve guard and exhale. Do you feel any air leaking out? If so, the mask does not fit properly and fumigant may leak in.

Q. Describe the three methods currently accepted by OSHA to fit test a respirator.

A.
1. The taste test: With the facepiece on, a test agent with a strong flavor is sprayed around the wearer. If the wearer detects the taste, the mask does not fit properly.
2. The odor test: With the facepiece on, a test agent with a strong smell is sprayed around the wearer. If the wearer detects the smell, the mask does not fit properly.
3. The irritant smoke test: With the facepiece on, an irritant smoke is released around the wearer. If the wearer suffers from involuntary reactions such as coughing and sneezing, the mask does not fit properly.

Q. What information do gas detectors provide?

A. Gas detectors indicate fumigant levels during treatment and aeration. They can detect leaks in structures or under tarps during fumigation. They can help determine the dosage requirements for future fumigation.

Detectors also measure the success of aeration by monitoring the presence or absence of fumigant vapors.

Q. What type of gas is dangerous to measure with a halide detector? Why?

A. A flammable gas, because halide detectors operate with an open flame. Always read the label information to determine the flammability of the product(s) you use.

Q. What is the most common type of thermal conductivity analyzer (TCA)?

A. The Fumiscope®

Q. When using a TCA, how can you avoid a false reading due to the presence of gases other than the one you are measuring?

A. Place some type of sorbing material into the sampling line.

Q. What type of gas detector is disposable?

A. Glass detector tubes