PART II

The Label
PART II: THE LABEL

This manual has been designed in two parts for easy reading and studying, as well as for a reference tool for easy understanding of the fumigant label in the future. The single most important piece of information to remember is:

Always read and follow label directions.

Part I covered types and characteristics of fumigants, stored grain management, alternatives to chemical fumigants, and laws and regulations. Part II of this manual focuses on the fumigant label. Part II is divided into 5 chapters that cover those corresponding areas of every label. These chapters contain explanations of the label information as well as helpful tips on how to implement this information.

Remember that every pesticide label will have some of the information contained in these chapters, but it will not necessarily be laid out in the same order or with the same exact headings.

Some fumigant labels are better or more complete than others, so it is not wise to simply depend on the label for all information. Studying these chapters on the label and reading the label itself is the best way to gain a complete understanding of the laws and regulations, safe handling, and proper usage of fumigants. A copy of a fumigant label has been included in the appendix to this manual for you to reference while you are reading this section.

Because chloropicrin and methyl bromide use is strongly discouraged, this manual will focus almost completely on phosphine, its application, and safety in handling.
Precautionary Statements

In This Chapter

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**Part II, Chapter 5: PRECAUTIONARY STATEMENTS**

**Learning Objectives:**

- List the steps to take if someone inhales, ingests, or comes into contact with a fumigant.
- List the precautions you need to take to reduce the risk of a fumigant igniting spontaneously.
- List five substances with which fumigants should never come into contact.

**Hazards to Humans and Domestic Animals**

Tablets and pellets of aluminum or magnesium phosphide and the dust that is rubbed off of them in transport and handling may be fatal if swallowed. This is true both for animals and humans. Most farmers are very good about how they handle and store pesticides and have quite a bit of experience in handling toxic chemicals so they are not ingested or swallowed by themselves or their animals. But the handling of phosphine is different from other chemicals on the farm and does not follow the common sense rules of pesticide use. Chapter 3 of this part of the manual will go into more detail about the protective clothing needed when handling phosphine.

Only light cotton gloves and loose-fitting cotton clothing should be worn while fumigating with or handling phosphine so no residues will be trapped against the skin and cause burning.

Since less protective gear is worn while handling phosphine than with other pesticides, there is more of a chance of having the residual dusts cling to hands, lips, hair, and clothing. As long as this dust does not become wet, it will take quite some time for the humidity in the air to cause the reaction that turns aluminum or magnesium phosphide into phosphine gas. **Remember that even sweat or dampness in the clothing from sweat can begin this reaction.** This residual dust can be inadvertently swallowed and may kill if the applicator does not follow these precautions:

- **Do not eat or drink while fumigating or before completely washing up and changing clothing after fumigating.** Even though this makes perfect sense, many applicators forget that after they have left the fumigating area (bin or building) and are out of the immediate inhalation.
danger, they may still contaminate themselves. It is very easy on a hot day to want to have a quick drink of water, or over the lunch hour grab a bite to eat, or even share a cup of coffee with the neighbor who pulls up to see what's going on, before fumigating that last bin. But remember that anything that goes in the mouth is almost always touched by the lips or fingers. Even if you are extremely careful, dust may waft down from the hair, eyebrows, eyelashes, or nose and contaminate what's going in the mouth. All Clothing Must Be Removed Outside (not a good time for the neighbor to pull up to see what's going on), and the applicator must completely wash every part of the body with soap and water before even thinking about having that sandwich or soda. Eat and drink before you start fumigating or after you clean up.

• Do not smoke or chew tobacco while fumigating. Not only does smoking while fumigating increase the chances of a fire or explosion due to the fact that fumigants are highly flammable, but smoking or chewing during or after fumigating may contaminate or even kill you. Remember how each of these activities takes place. To smoke, fingers touch the pack, cigarette touches the lips, and exhalation through the nose may blow particles of the fumigant off of the face and onto the cigarette filter. To chew, fingers dive into the can or pouch and a wad of tobacco is usually placed into the mouth, fingers and all. Also, chewers tend to spit and lick their lips more while they are chewing and this also poses numerous hazards. Tobacco users should always leave their packs, cans, or pouches in the truck or at home while fumigating. Every precaution might have been taken not to smoke or chew while fumigating or even until after cleaning up, but that pack or can that was in the pocket of the shirt or jeans may still be contaminated. If you must smoke or chew, do so before you start fumigating or after you clean up.

• Do not take bathroom breaks while fumigating. Pesticide poisoning most often occurs through the skin, and even though fumigants are more likely to severely burn the skin than to be absorbed into the body, absorption sometimes happens. Regardless of the effect, whether poisoning or burning, the skin tissues in the genital area are the thinnest and most sensitive on the body and are best protected by not being touched during or after fumigating until decontamination has taken place. It is a good idea to monitor fluid intake before fumigating, especially if the fumigation and decontamination will be lengthy, so a break will not be necessary. Use the bathroom before you start fumigating or after you clean up.

In other words, the entire fumigation should be completed in one session with no breaks. Then the applicator should completely decontaminate before doing anything else. It is often very hot inside bins or other grain storage buildings; use common sense in planning your fumigation so heat stroke and dehydration do not take place. These are very toxic chemicals that can be deadly if mishandled, so it is best to be alert, fresh, and comfortable while
handling them. When conducting a large fumigation (several large bins or buildings), it may be a good idea to decontaminate and change to new clothing at the half-way point, so there can be time to rest and recover.

**Physical and Chemical Hazards**

Aluminum and magnesium phosphide tablets and pellets produce phosphine gas when they come in contact with the moisture in the air. Usually this process takes between a half hour to an hour to produce measurable levels of phosphine gas, but this is not always the case. Chapter 6 of this part of the manual will explain more about how phosphides can be handled safely during application.

Phosphine gas can ignite spontaneously when the levels in the air exceed 18,000 ppm. When this “flash point” or burning point is reached, there is a very energetic burn. **And if the concentration of phosphine gas is high enough around the burn, an explosion may occur that could cause severe personal injury or even death.** When handled properly, it’s very difficult to bring the levels of phosphine up to this flash point. But there are several situations in which this may happen:

- Phosphide pellets and tablets produce phosphine gas when they are exposed to moisture in the air. This process is speeded up when pellets and tablets are exposed to water, oil, acids, and many other liquids and phosphine gas may be produced in quantities high enough to produce an explosion in an isolated area. **For example, pellets tossed into an aeration floor or duct where water or oil leaking from hydraulic hoses leading to a rotary motor has pooled and where the gas may be trapped.**

- Phosphide pellets or tablets that are stacked or piled on top of each other may cause a temperature increase that in turn speeds up the release of phosphine gas. This gas may be confined to the pile, even a small pile, and quickly reach the flash point. Pellets and tablets must be spread out throughout the fumigation area, or when probed into the grain, they must be deposited at various depths. **For example, pellets placed in a heap on top of the grain mass may heat up and explode.**

- Phosphide tablets and pellets usually come in metal flasks with a screw-top lid. Inside these flasks there is always some air, phosphide dust, and some phosphine gas. It is unusual for the phosphine concentrations inside the canister to reach 18,000 ppm, the flash point, but it can happen. **ALWAYS open phosphide flasks outside, or next to a ventilation fan that will direct the fumes immediately outside, and ALWAYS point the flask opening away from your body while unscrewing the canister slowly!**.

“18,000 ppm is phosphine’s ‘flash point’.”
Pure phosphine gas is stable at room temperatures below concentrations of 18,000 ppm. But it may react with certain metals and cause corrosion. This corrosive ability increases with the temperature and humidity.

**These are the metals that phosphine gas corrodes:**

- Copper
- Copper alloys
- Brass
- Silver
- Gold

While these metals aren’t often stored in their raw form inside a grain storage facility, keep in mind that elements of each of them are often found in the following:

- Small electric motors
- Smoke detectors
- Sprinkler heads
- Batteries
- Battery chargers
- Fork lifts
- Temperature monitoring equipment
- Switching gears
- Communications devices
- Computers
- Calculators
- Cell phones

It is a good idea not only to keep these and other electrical devices away from phosphine for the sake of the particular item, but also to make sure that any electrical circuits aren’t damaged and create a fire.

Phosphine also will react with certain metallic salts, and any items that contain them, such as photographic film and inorganic pigments, should not be exposed.

Remember to remove all jewelry, watches, rings, necklaces, bracelets, and keys from the body before fumigating. If they are worn during fumigation, they may be corroded. Also, if they are worn they may trap the gas or dust against the body and cause severe burning.
Practical Treatment Statement (First Aid)

Symptoms of overexposure to phosphine are headaches, dizziness, nausea, ringing in the ears, difficulty breathing, and diarrhea. If any of these symptoms occur to any person in or around a grain storage facility during a fumigation or up to several days after a fumigation, CALL 911 and SEEK MEDICAL ATTENTION IMMEDIATELY! Do not wait to see how the symptoms will develop or if the affected person will recover; CALL 911 and go directly to the hospital. When dealing with fumigants, the old saying, “Better to be safe than sorry” changes to “Better to be safe than DEAD”!

In every case of exposure where symptoms are noted, a hospital visit is in order. But to reduce the risk of further injury before a doctor can be reached, here are the recommended first aid tips:

If phosphine (gas, powder, dust, pellets, or tablets) is:

• **Inhaled** — First move the exposed person to fresh air. Keep the person warm and make sure he or she can breathe freely. If the person has stopped breathing, give artificial respiration by mouth or other means. Do not give anything by mouth to an unconscious person.

• **Swallowed** — Drink or administer one or two glasses of water and induce vomiting by touching the back of the throat with a finger, or by drinking syrup of ipecac if available. But do not give anything by mouth to a victim who is unconscious or not alert.

• **Skin** — Brush material off clothes and shoes in a well ventilated area. Allow clothes to aerate in a ventilated area prior to laundering. Wash contaminated bare skin thoroughly with soap and water. Medical attention is needed only if there is burning or severe irritation.

• **Eyes** — Flush eyes with plenty of water.

Note to Physician

Every pesticide label includes a section called “Note to Physician.” This section is intended to assist the doctor in quickly diagnosing and treating exposure to a particular pesticide. On phosphine labels, the notes to the physician include symptoms normally associated with mild, moderate, and severe poisoning. Some labels may even include the recommended treatments for each of these exposures. But the most important piece of information in the “Note to Physician” section is what chemical the victim has come in contact with, so the doctor can contact Poison Control, whether on the state or national level, for information on the best way of treating the exposure.
It is a good idea for every applicator to carry a highlighted copy of the Note to Physician in his or her pocket when fumigating.

If for some reason, one or both applicators should become unconscious or severely ill during fumigation, this gives emergency personnel information to pass on to the doctor that may limit injuries or even save lives.

**Remember:** The law says you are required to have a label on hand for every restricted use pesticide you are applying.