

Phosphine Fumigation

Changes to Label Requirements

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YOUR HEALTH AND SAFETY... OUR PRIORITY.



Topics for Today

- Health Canada's Role - Registration and Compliance of Pesticides
- Phosphine uses
- Label changes – What's new?
- Training
- Fumigation Management Plan
- Personal Protective Equipment: handling, monitoring, aeration, handling
- Fumigation zone vs fumigation site
- Placarding
- Monitor
- Aeration
- Product list
- Incidents

Health Canada's Role

- Health Canada is the federal department responsible for helping the people of Canada maintain and improve their Health.
- Health Canada's Pest Management Regulatory Agency (PMRA) works to prevent unacceptable risks to people and the environment by regulating products used for the control of pests.
- PMRA applies and enforces the *Pest Control Products Act* (PCPA) and its Regulations

Health Canada's Role

Pest Management Regulatory Agency (PMRA)

- Registration : scientific evaluation of the product before it is marketed. The end result is a registration number and an approved label (use direction)
- Re-evaluation : every 15 years. Allows the PMRA to review studies and data and verify if the current uses do not represent unacceptable risks according to the new norms.
- Compliance Promotion and Monitoring : once the product is registered. Verification of the manufacturing, the storage, the distribution (including publicity) and the uses of the registered products.

Pesticide Registration and Compliance

Compliance:

The *Pesticide Compliance Program (PCP) of Health Canada* is responsible for pesticide compliance in Canada.

The PCP fulfills this responsibility by:

- Performing on-site **inspections** of use and storage of pesticide products;
- Conducting **sampling** of pesticides or things pesticides are applied to, things pesticides are in, or around; and
- **Investigating** the use, sale, importation and manufacturing of pesticide products;
- **Informing** and **enforcing** regulatory requirements.

Pesticide Registration and Compliance



Compliance is an essential component of the regulatory system

Examples of some PCPA prohibitions:

6.(1) - prohibits manufacture, possession, handling, storage, transport, import, distribution and use of unregistered pest control products.

6.(5) - prohibits handling, storing, transporting, using or disposing of a pest control product in a manner inconsistent with the registered product label directions.

6.(7) – prohibits packaging or advertising a pest control product in a way that is false, misleading or likely to create an erroneous impression regarding its character, value, quantity, composition, safety or registration.

6.(8) – prohibits manufacture, possession, handling, storage, transport, distribution, and disposal in a way that endangers human health or safety or the environment.

Pesticide Registration and Compliance

A Pest Control Product is defined in the *Pest Control Products Act*

What is a compliant pest control product?

- Properly registered by Health Canada;
- Is distributed for the appropriate and approved uses;
- Is used according to the label's direction; and
- Is handled in a safe manner, according to the label directions

Phosphine Uses



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Commodity Fumigation

- Raw Agricultural Commodities (grains, nuts, seeds, etc.)
- Processed Foods (sugar, flour, coffee, animal feed, bagged cereals, dried food etc.)
- Non-food commodities (tobacco, furniture, wood, animal hides, natural fibers, etc.)
- **Not registered for use on Flax or Canola**

Phosphine Uses

Burrowing Rodent Control

- Groundhogs (Woodchucks)
- Ground Squirrels, gophers



Phosphine Uses

Space Fumigation/Structural Fumigation

- Tarped areas
- Mills
- Food-Processing Plants
- Warehouses

Phosphine Uses

- **Application Sites / Methods**
 - Mills, food processing plants, warehouses
 - Vertical bins, silos
 - Tarpaulin fumigations
 - In-transit fumigation of shipholds, railcars, containers, trucks, vans, other transport vehicles
 - Rodent burrows

Note: Transport vehicles (trucks, containers, vans, etc.) can travel by rail but, **cannot** travel on public roads **until completely aerated**.

Toxicity of Phosphine

- Phosphine products are RESTRICTED due to high toxicity
- NIOSH IDLH = Immediately Dangerous to Life or Health
 - concentration for phosphine gas is 50 ppm
- Re-evaluation: Label requirements protect workers and bystanders
- Read the Label:
 - Precautions
 - Toxicological Information
 - First Aid

Label changes since 2017

- 2016 labels amended the 50 m buffer zone to 30 m for all uses, with a 200 m setback for difficult to evacuate zones.
- New data has allowed for revision of how phosphine products are used.
- 3 products have the new label
 - Degesch Phostoxin Tablets (registration number 15736)
 - Degesch Phostoxin Pellets (registration number 15735)
 - Sunzon Fumitoxin Pellets (registration number 19226)
- Other phosphine products expected to have new labels in 2018, if the registrant has submitted an amendment

Use according to the registered label

What Is Changing

Four Major areas:

1. Mandatory Training **NEW**
2. Respirator and/or Monitor
3. Fumigation Zone (varies by site)
4. Aeration

1. New: Mandatory Training For Everyone On Site

NEW*

- Hazards of the product
- Use of safety equipment (respiratory protection and personal monitors)
- Exposure limit of 0.1 ppm
- Procedures when levels of Hydrogen Phosphide gas exceed 0.1 ppm

Training is to be provided annually

These products are Restricted because of high acute toxicity.

It is essential that anyone working in and around areas where they are used be aware of the symptoms of exposure

TRAINING: Responsibilities

APPLICATOR

Inform the person in charge of the facility or farm

- Requirement for annual training of all employees
- Maintenance of training records for 2 years
- How to obtain training material

MANUFACTURER

- Has product-specific training material on request

PERSON IN CHARGE OF THE FACILITY OR FARM

- Develop site specific training
- Provide product-specific and site-specific training to all
- Maintain training records for workers for 2 years minimum

Who Must Receive Annual Training

All Employees In Facilities Where Phosphine is Used

All Employees On Farm Where Phosphine is Used

Training is Mandatory

Product-specific training material supplied by the manufacturer

Symptoms of Mild Inhalation Exposure Include:

- Malaise (Generally feeling unwell)
- Ringing in the ears
- Fatigue
- Nausea
- Pressure in the chest which is relieved by removal to fresh air

Symptoms of Moderate Poisoning Include:

- Weakness
- Vomiting
- Pain just above the stomach
- Chest pain
- Diarrhea
- Difficulty breathing

In its milder to moderate forms, symptoms of poisoning may take up to 24 hours to appear.

Symptoms of severe poisoning include:

- Dizziness
- Blue/purple skin
- Unconsciousness and Death

High exposure may also lead to:

- Fluid in the lungs
- Effects on the liver, kidneys, lungs, nervous system and circulatory system.

Symptoms of severe poisoning may appear within a few hours or up to several days later

Symptoms of Exposure to Phosphine Gas

- Although some of the symptoms are non-specific, and could occur due to other causes, if they occur when there is potential for phosphine exposure, it is imperative that workers pay attention to them.
- Frequent exposure to concentrations above permissible levels over a period of days or weeks may cause poisoning.
-
- In all cases of suspected exposure, workers should remove themselves **immediately** from the source of exposure
- Specific instructions and further information appear in the **First Aid** and **Toxicological Information** sections of the label.

Fumigation Management Plan (FMP)

Prepare FMP before Application

What is the Fumigation Management Plan?

- Requirement for all Fumigations
- Guidance Document on all labels/Applicator's Manual
- FMP Template available from Registrant
- To be completed prior to every fumigation treatment
- To be retained for at least 2 years for verification
- Helps ensure a safe, legal and effective fumigation
- **READ YOUR LABELS**

Fumigation Management Plan

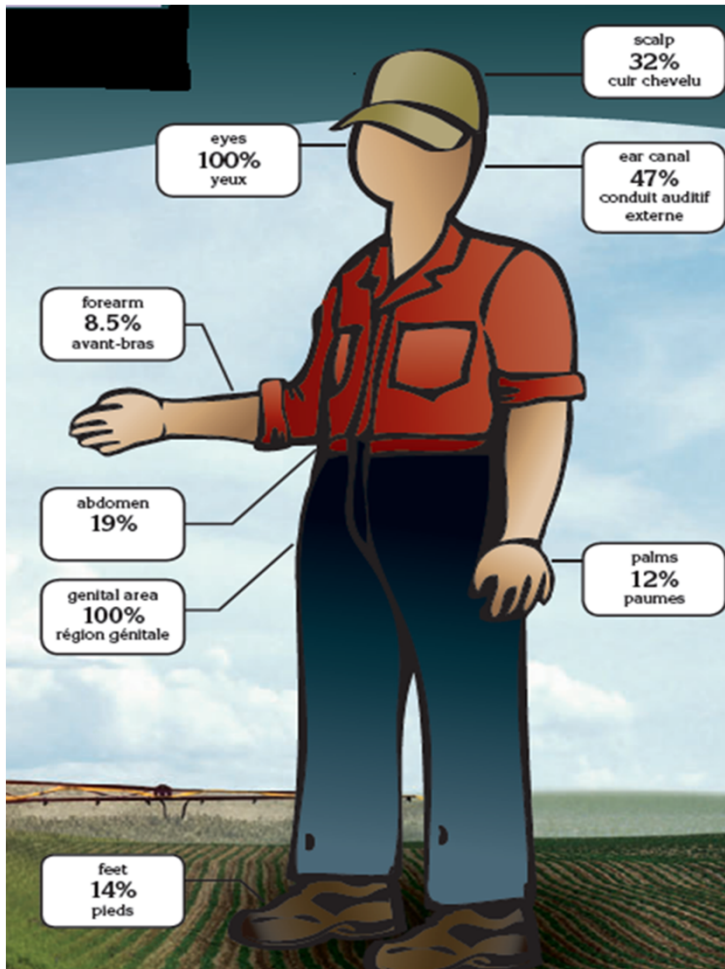
Fumigation Checklist:

- Preliminary planning and inspection of treatment site
 - Commodity, type of structure, dose
 - Find possible leaks.
- Warnings and training of personnel around treatment site
- Monitoring - before, after and during (periodically)

Fumigation Management Plan

- **Fumigation Checklist (cont.):**
- Notifications (local authorities) and Emergency Response Plan
- Sealing procedures and placarding
- Application
- Post-application operations.
 - Ventilation
 - Gas monitoring and leak containment
 - Gas-free and re-entry

Personal Protective Equipment (PPE)



- Dry gloves of cotton
- Loose fitting long sleeve shirt
- Long pants
- Shoes and socks
- **NIOSH approved respirator**
- Monitor calibrated to 0.01 ppm; alarm set at 0.1 ppm

Phosphine: exposure is through inhalation; Wear approved respirator

NEW: Respirator or Monitor

NEW*

In the Buffer Zone

Respirator

Delivery/Dispensing

Spills and Leaks

Deactivation

Monitoring hydrogen
Phosphide Levels

Fumigation

Aeration

In the Fumigation Zone

Respirator or Monitor

Respirator

when Hydrogen Phosphide > 0.1 ppm

Respirator OR Monitor

when Hydrogen Phosphide unknown

Monitor – limit of detection 0.01 ppm
- alarm set at 0.1 ppm

If levels > 0.1 ppm and not wearing a
respirator

MUST VACATE AREA IMMEDIATELY

Required Respiratory Equipment

NEW

Phosphine Level (ppm)	Minimum required Respiratory Equipment
Unknown	Personal hydrogen phosphide monitor or respiratory equipment required for phosphine levels greater than 5 ppm
> 0.1 ppm ≤ 5 ppm (or equal to)	NIOSH-approved air-purifying full face respirator (gas mask) with a chin-style front- or back-mounted canister approved for hydrogen phosphide OR a NIOSH-approved supplied air respirator (i.e., air-line respirator or self-contained breathing apparatus) with a full face piece.
> 5 ppm	NIOSH-approved self-contained breathing apparatus with a full face piece operated in a pressure-demand or other positive-pressure mode OR a NIOSH-approved air-line respirator with a full face piece operated in a pressure-demand or other positive pressure mode combined with an auxiliary self-contained positive-pressure breathing apparatus.
Emergency Use or Immediately Dangerous to Life or Health	NIOSH-approved self-contained breathing apparatus with a full face piece operated in a pressure-demand or other positive pressure mode

Air purifying respirator

- Canister provides filtration of ambient air.
- Secure up to 5ppm of phosphine in ambient air.
- Comes in various styles:
 - Chin mounted canister
 - Front mounted canister
 - Belt or back mounted canister
- Some models have a motorised air intake



Air-Line Respirator

- Also known as SAR (supplied air respirators)
- Offers more protection than air purifying respirators (i.e. canisters)
- Constant flow of air arriving from compressor or other external source.
- No tank to carry around
- Full face mask also protects eyes from spills and chemical exposure.
- Can be tight fitting (fit test required) or loose fitting.



Self Contained Breathing Apparatus

- Also known as SCBA
- Supplies positive pressure breathing air to the user
- Composed of an air cylinder, a regulator, a facepiece and a harness
- Depending on the size of the cylinder, autonomy time can vary between 30 min to 90 min.



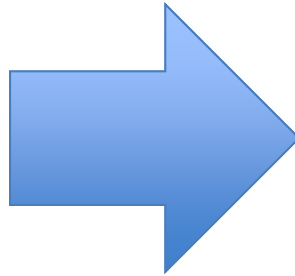
The 0.1 ppm Exposure Limit

Workers **MUST NOT** be exposed to phosphine levels above 0.1 ppm for any duration of time without respiratory protection.

This is not a time-weighted average

3. New: The Fumigation Zone

Buffer Zone



Fumigation Zone

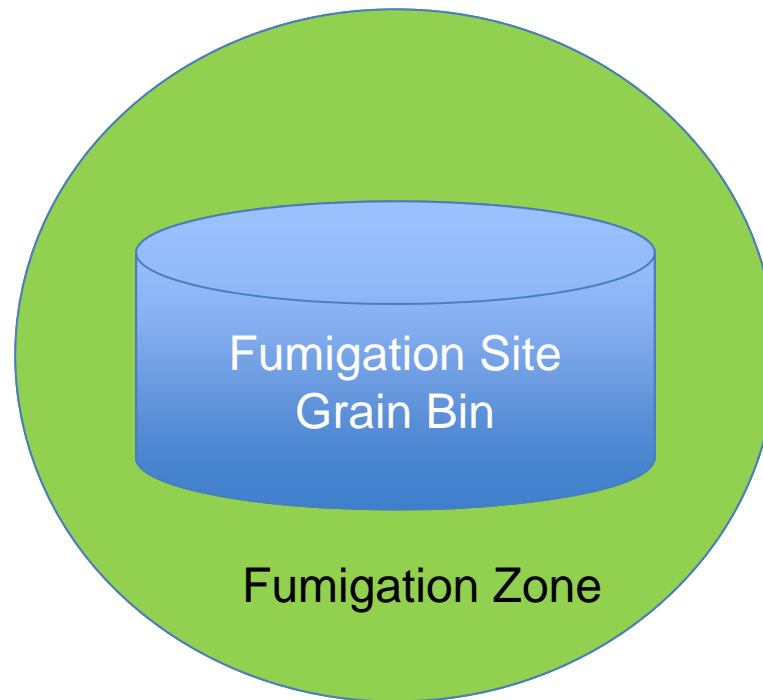
NEW

- 30 metres for all fumigated sites
- Varies with site of fumigation

Fumigation Site / Fumigation Zone

The Fumigation Site is the treatment site (e.g. grain bin)

The Fumigation Zone is the area surrounding the Fumigation Site that is restricted to workers with respirators or monitors



The Fumigation Zone

A fumigation zone must be established for all fumigation sites

NEW*

Site	Minimum Distance of Fumigation Zone	
	During Fumigation Period	Aeration Period
Indoor Application Sites	10 metres or ALL workers in facility MUST wear a personal hydrogen phosphide monitor	Fumigation Zone Determined by licensed/certified applicator
Vessels	Determined by licensed/certified applicator	
Outdoor Application Sites	Determined by licensed/certified applicator	
Tarpaulins	30 metres or boundary of the room	
Railcars	30 metres	

In the fumigation zone

- Entry by unprotected workers into the fumigated site is allowed only when the concentration of PH₃ is ≤ 0.1 ppm

NEW

- During fumigation or aeration, all workers in the fumigation zone **MUST** wear *either*
- Appropriate respiratory protection **OR**
- Personal hydrogen phosphide monitor with a limit of detection of 0.01 ppm and an alarm set at 0.1 ppm.
- If hydrogen phosphide levels > 0.1 ppm, workers wearing a monitor but, not respiratory protection
must vacate the area IMMEDIATELY

Placarding

Where

- At the Fumigation site
- At the Fumigation Zone perimeter

When

- Before fumigation starts
- until after Aeration to 0.1 ppm

The Placard is at least standard page size
(21.5x28 cm or 8.5x11 in.)

Placarding

DANGER



Area under



Fumigation

DO NOT ENTER

Fumigation Begins: *date/time* Aeration Begins: *date/time*

Name of Fumigant Product

Contact Info (of fumigator)

24 HR emergency Response Telephone Number

Monitoring the Fumigation Zone

- From the beginning of fumigation until Aeration is complete
- Monitor periodically
- Monitoring schedule determined by the applicator
- Monitor until $[PH_3] < 0.1$ ppm
- If at any time, $[PH_3] > 0.1$ ppm at the perimeter of the fumigation zone → Extend the Fumigation Zone
- If $[PH_3] > 0.1$ ppm and the fumigation zone perimeter cannot be extended, take appropriate action
→ Cease delivery/dispensing; Seal leaks; Limit aeration

4. NEW: Aeration

NEW*

The Licenced/Certified Applicator must be present during aeration until the levels of hydrogen phosphide are below 0.1 ppm.

Explosive Hazard

Chemical Dangers

- Metal phosphide in tablets, pellets, and partially spent dust will release hydrogen phosphide gas (phosphine) if exposed to moisture from the air or if in contact with liquid
- Hydrogen phosphide may ignite spontaneously
- Explosions can occur

Do not confine spent or partially spent metal phosphide fumigants

Do not pile tablets, pellets, or bags

Open flask in open air or near a fan or other ventilation to prevent flash

Phosphine Fumigants Available in Canada

Aluminum Phosphide	PCP Registration #
Phostoxin	15735*, 15736*, 16351, 16438, 20252
Gastoxin	17187, 17188, 23842, 23843
Fumitoxin	19226*, 19227
Weevil-cide	29455, 30013
Magnesium Phosphide	
Fumi-Strip/Fumi-Cel	26188
Magtoxin	26523, 26524
Phosphine	
Eco2-Fume	27684

*Products registered with the new label changes as of January 1, 2018

Incident Reporting

- An unintended or unexpected effect resulting from exposure to, or use of, a pesticide

➤ Effects on:

- Humans
- Domestic animals
- Environment
- Packaging failure

Minimum information required:

- active ingredient or product name
- description of effect

Effects resulting from the misuse of a product **are reportable**.
Incidents do not have to be proven or substantiated.

Incident Reporting

Why declare an incident? To allow the PMRA to:

- Continue monitoring the safety of pesticides once they are on the market;
- Identify potential risks to health or the environment
- Take corrective actions in order to mitigate identified risk

How can I declare an incident?

- Download a Voluntary Incident Reporting Form, fill it and send it to www.healthcanada.gc.ca/pesticideincident
- Enquiries relating to pesticide incidents :
pmra-incident-arla@hc-sc.gc.ca
- Contact the manufacturer and declare the incident: they are required by law to declare all incidents they are made aware of concerning their products.
- General enquiries : 1-800-267-6315 pmra.infoserv@hc-sc.gc.ca

Compliance and Enforcement Actions

Administrative Monetary Penalties

- 2015 – Orkin Canada – fumigation with a phosphine product without a licence and without proper personal protective equipment. **\$8,000 fine.**

Prosecutions

- 2017 Decision: Province of Alberta vs. Orkin Canada, 2015. Treatment of a flour mill with Magtoxin (magnesium phosphide). Some product was left in the mill when the workers arrived Monday morning. **\$150,000 fine.**

Read the label

Follow the label

Keep yourself safe

Keep people around you safe

Questions

