



Controlling rabbits with fumigation

INFORMATION SHEET AND MATERIAL SAFETY DATA SHEET

This leaflet has been produced by the Otago Regional Council to provide information on the safe and effective use of fumigants in the control of rabbits.

Magtoxin

Magtoxin is a fumigant used to control rabbits. It can be purchased from rural supply stores, but if more than 3 kg is required then the purchaser must hold a controlled substances licence (CSL). A CSL is not required if the aggregate quantity of substances that contain aluminium or magnesium phosphide is 3kg or less.

Chemical and physical properties

Hydrogen phosphide gas (phosphine) is released by Magtoxin. Hydrogen phosphide is a highly poisonous and flammable gas produced from certain phosphorus compounds when placed in contact with water. The gas is produced by the action of water vapour from the soil and air reacting with the magtoxin tablet.

Magtoxin is a solid fumigant and is easily used if correct procedures are followed. Pellets weigh approximately 0.6 grams and release 0.2 grams of hydrogen phosphide gas. They are about 10mm in diameter and are packaged in resealable flasks containing either 1660 or 166 pellets depending on flask size.

When to fumigate

If used correctly, fumigation will kill all rabbits in a burrow. When rabbits are seen to go to ground during rabbit control operations, such as nightshooting or Dog and Gun, they should be fumigated. Please note that rabbits in situations such as in piles of rocks or under buildings are difficult to control by fumigation and alternative methods should be used.

Methods of use

Magtoxin produces a heavier-than-air gas and the pellets should be placed well down the burrow before blocking the entrance.



Gassing a burrow

When an occupied burrow is located (e.g. rabbits have been seen entering it, a dog indicates it is occupied, or it is obviously in use as depicted by scrape marks and the absence of cobwebs across the entrance, etc) check the surrounding area for other entrances.

Many burrows-especially warrens-have other entrances and if these are not found and covered the rabbits will escape. Spend time checking the area around the burrow entrance.

Be particularly careful to look in long grass for concealed entrances. If you are using dogs, keep them well away and make sure that none, especially small dogs, go down into the burrow.

When you are ready, and all other entrances have been identified, chop back each burrow entrance as shown in the following diagram. Before you place the fumigant in the burrow, have a solid object ready to place in the hole, such as turf or a rock. If this is not available, then newspaper in the hole will also act as a deterrent to the rabbit digging out. It will also stop the fumigant being covered when filling in the entrance.

Estimate the size of the burrow in cubic metres (m^3) and apply pellets at a rate of 2g phosphine (PH_3)/ m^3 (or 10 pellets/ m^3 or 1 pellet per $0.1m^3$), sealing all entrances to burrow.

Quickly close each entrance as you do so. If you are using a turf sod, put the grass side face in, and make sure it is not touching the gas tablet. Chop more earth down into the entrance, firmly tamping to make the covering airtight. Level off the ground to remove as much of the entrance as possible at the end of the job. This assists in preventing the entrance being located and reopened from the outside by another rabbit. This is particularly important when fumigating stops containing kittens (baby rabbits), when the doe may return to the stop and open it up.

If you are using dogs where the main shelter is warrens, cover the area thoroughly first to drive as many rabbits underground as possible, and then systematically fumigate the area.

For closing burrows and filling in holes, a small short handled grubber (trapping grubber) or a small folding spade is most suitable, and should always be carried when you are using gas (see illustration right).

Residue

After decomposition, Magtoxin leaves a grey-white powder composed almost entirely of magnesium hydroxide. Although a slight trace of undecomposed magnesium phosphide may be present in the powder, it is not considered to be hazardous waste.

Hints for more effective use

In dry conditions where the fumigant may be slow to work, pellets can be placed on **damp newspaper**. This will promote a more rapid action.

Precautions

Magtoxin pellets are supplied in a gas tight packaging and the storage life is unlimited as long as the packaging remains intact.

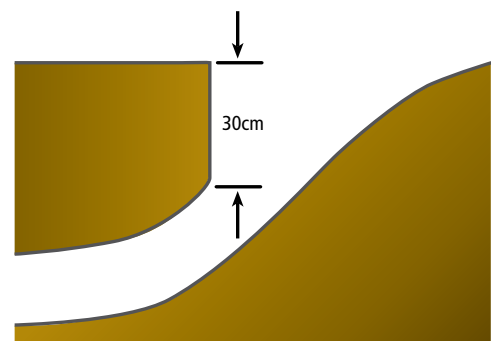
Flasks should be stored in a cool, dry, locked, well ventilated area and away from occupied quarters, A Hazchem warning notice should be fastened to the outside of the storage area.

Before handling, read and understand the directions on the Magtoxin label. Open containers out of doors. Wear gloves when handling Magtoxin pellets. Do not smoke or touch food when handling fumigants. If fumigating in a breeze, ensure that the wind direction is across your

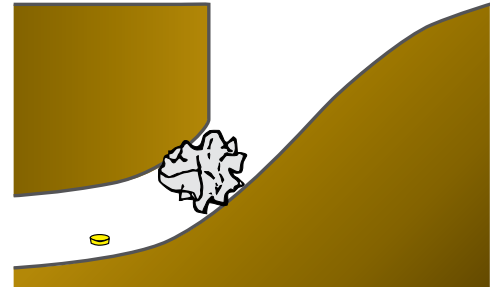
Method of placing fumigant in rabbit burrow.



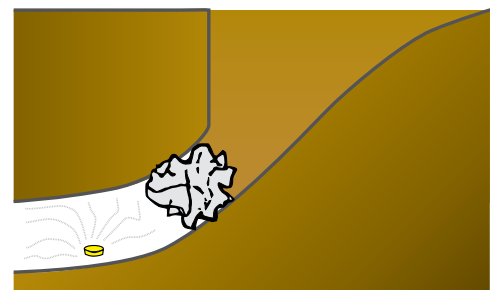
Original opening



Cut back opening



Placement of fumigant tablet and newspaper



Filled in opening

body, rather than directly into your face or from behind. This will help prevent the inhalation of gas from the bottle or burrow.

Flasks of pellets may be tightly resealed for future use if not all of the contents are used immediately. On reopening, avoid breathing the small amount of gas that will have built up.

Before disposing, clean Magtoxin containers by rinsing at least three times with water. Do not attempt to re-use fumigant containers for any other purpose.

Disposal of containers should therefore be in an approved manner, such as flattening and burial. At all times, ensure you wash your hands after use.

WARNING

As Magtoxin reacts with water to produce a poisonous gas, under no circumstances dispose of the dust directly into a toilet or open drain.

Symptoms of poisoning

Poisoning may occur by either inhaling the gas, but also by swallowing the fumigant.

Symptoms of poisoning may vary as they are entirely dependent on the amount of hydrogen phosphide that is inhaled or the amount of fumigant swallowed.

However, some of the symptoms of poisoning which may result when exposed to small quantities are: fatigue, buzzing in the ears, nausea, pressure in the chest and uneasiness, which may pass when the victim is exposed to fresh air.

Greater quantities will quickly lead to: general fatigue, nausea, stomach – intestine symptoms similar to the effects of “food poisoning”: i.e. vomiting, stomach aches and diarrhoea, disturbed balance, strong pains in the chest, and laboured breathing.

Very high concentrations rapidly result in: intense laboured breathing, skin turning blue, agitation, imperfect control of body movements, lack of oxygen, unconsciousness and death. Death can be caused immediately or days afterwards.

First Aid

If Magtoxin is accidentally swallowed give the victim a glass or two of water and induce vomiting by putting a finger down the throat. Repeat until vomit fluid is clear in appearance. Call a doctor.

If any of the described symptoms of poisoning appear, the affected person must be immediately taken into the open air, laid down in a comfortable position and be kept quiet and warm.

In case of slight poisoning, the patient will recover rapidly, i.e. within 1-2 hours. However, under no condition should the patient resume work during the next 24 hours as repeated exposures within short intervals can be dangerous.

For severe poisoning it is recommended that physicians administer a cardiac tonic and a drug to stimulate blood circulation.

**NOTE:
THERE IS NO SPECIFIC ANTIDOTE
KNOWN FOR THIS POISONING.**

Precautions for use

Do not eat, drink or smoke while using.

Wash hands thoroughly before meals and after use of fumigant.

As Magtoxin releases a poisonous gas which can result in permanent lung damage the material should be used only by experienced staff instructed on its use and familiar with the precautionary measures to be observed.

Store in original container, tightly closed, away from foodstuffs and under lock and key.

Do not open container except for immediate usage.

Always open in open air.

Protect from moisture, open flames or heat and keep away from liquid water. Do not breathe dust or fumes. Poisonous if swallowed.

When handling pellets wear waterproof rubber gloves.

Keep a respirator readily available with suitable filter against phosphine for emergency cases.

Rooms under fumigation should be entered under respirator protection only.

Adjacent rooms have to be kept well aired.

Fumigation should never take place in inhabited buildings.

Rinse, crush and bury empty container.



MATERIAL SAFETY DATA SHEET

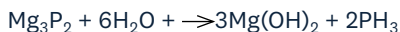
MAGNESIUM PHOSPHIDE - MAGTOXIN

HAZARDOUS INGREDIENTS INFORMATION

Substance Name:	Pellets containing 660 g/kg magnesium phosphide
Trade Name:	Magtoxin
Hazchem:	4WE
Packing Group:	I
UN Number:	2011
ERMANZ Hazard Classification:	4.3A, 6.1A, 6.3B, 6.4A, 6.9A, 9.1A, 9.3A
Maximum Transport Limit:	Without DG docs and placarding – 3 kg for non-approved handlers and 5 kg for approved handlers

Identity:

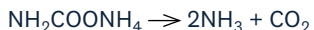
Magtoxin, Magnesium Phosphide, Mg_3P_2 - Reacts with water to produce Phosphine, Hydrogen Phosphide, PH_3



Mg_3P_2 CAS No. 12057-74-8
 PH_3 CAS No. 7803-51-2

Magtoxin is formulated with 66% magnesium phosphide and also contains ammonium carbamate and inert ingredients.

Ammonium carbamate releases ammonia and carbon dioxide as follows:



NH_2COONH_4 CAS No. 1111-78-0
 NH_3 CAS No. 7664-41-7
 CO_2 CAS No. 124-38-9

Magtoxin is available as 0.6 g pellets and 3.0 g tablets. Products are packed in gas tight containers.



INHALATION EXPOSURE LIMITS

COMPONENT	OSHA PEL (ppm)	ACGIH TLV (ppm)	ACGIH TLV TWA (ppm)	IDLH STEL (ppm)
Hydrogen Phosphide	0.3	0.3	1.0	200
Ammonia	50	25	35	500
Carbon Dioxide	5000	5000	30,000	50,000

PHYSICAL CHARACTERISTICS

Boiling Point:

Mg ₃ P ₂	>1.000 °C
PH ₃	-87.7 °C

Specific Gravity of Vapours (Air=1):

Mg ₃ P ₂	N/A
PH ₃	1.17

Vapour Pressure:

Mg ₃ P ₂	0mm Hg
PH ₃	40mm Hg @ -129.4 °C

Solubility in Water:

Mg ₃ P ₂	Insoluble, reacts
PH ₃	26cc in 100ml water at 17 °C

Appearance and Odour:

Magtoxin and magnesium phosphide are a dark charcoal grey. The hydrogen phosphide (phosphine, PH₃) gas produced by these products has an odour described as similar to garlic, carbide or decaying fish.

Specific Gravity:

Mg ₃ P ₂	2.06
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Melting Point:

Mg ₃ P ₂	>1.000 °C	PH ₃ -133.5 °C
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FIRE AND EXPLOSION HAZARD DATA

Flash Point:

Magnesium phosphide and Magtoxin are not themselves flammable. However, they react readily with water to produce hydrogen phosphide (phosphine PH₃) gas, which may ignite spontaneously in air at concentrations above its LEL of 1.8 v/v. UEL of hydrogen phosphide is not known.

Extinguishing media:

Suffocate flames with sand, carbon dioxide or dry extinguishing chemicals.

Special fire- fighting procedures:

Do not use water on metal phosphide fires.

Respiratory protection:

Wear NIOSH/MSHA approved SCBA or equivalent respiratory protection.

Protective clothing:

Wear gloves when handling Magtoxin.

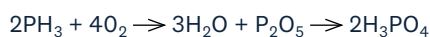
Unusual fire and explosion hazards:

Do not confine partially spent magnesium phosphide or hydrogen phosphide gas at levels above 1.8% v/v. The gas may ignite spontaneously in air above this concentration.

Open containers of magnesium phosphide fumigants in open air only and never in a flammable atmosphere. Spontaneous ignition may occur if large quantities of magnesium phosphide are piled in contact with liquid water.

This is particularly true if quantities of the material are placed in moist or spoiled grain, which can provide partial confinement of the hydrogen phosphide gas liberated by hydrolysis.

Fires containing hydrogen phosphide or metal phosphides will produce phosphoric acid.



REACTIVITY DATA

Stability:

Magnesium phosphide is stable to most chemical reactions, except for hydrolysis. Magtoxin will react with most air, liquid water, acids and some other liquids to produce toxic and flammable hydrogen phosphide gas.

Magnesium phosphide is more reactive than aluminium phosphide and will liberate hydrogen phosphide more rapidly and more completely at lower temperatures and humidities.

Incompatibility:

Avoid contact with water and oxidising agents.

Corrosion:

Hydrogen phosphide gas may react with certain metals and cause corrosion, especially at higher temperatures and relative humidities. Metals such as copper, brass and other copper alloys, and precious metals such as gold and silver are susceptible to corrosion by phosphine.

Small electric motors, smoke detectors, brass sprinkler heads, batteries and battery charges, fork lifts, temperature monitoring systems, switching gears, communication devices, computers, calculators and other electrical equipment may be damaged by this gas.

Hydrogen phosphide will also react with certain metallic salts and therefore, sensitive items such as photographic film, some inorganic pigments, etc should not be exposed.

Hazardous polymerization:

Will not occur.

HEALTH HAZARD INFORMATION

Routes of Entry:

Magnesium phosphide and hydrogen phosphide gas from these fumigants are not absorbed dermally.

Primary routes of exposure are inhalation and ingestion.

Acute and chronic health hazards:

Magnesium phosphide is a highly acute toxic substance. Hydrogen phosphide gas LC₅₀ is about 190 ppm for one-hour inhalation exposure.

The acute oral toxicity of the Magtoxin formulation was found to be 9.1 mg/kg of body weight. Magnesium phosphide is not known to cause chronic poisoning.

SPILL OR LEAK PROCEDURES

Spill cleanup procedures:

If possible, dispose of spilled product by use according to label instructions. Freshly spilled material, which has not been contaminated by water or foreign matter may be replaced into original containers.

Punctured flasks, pouches, or containers may be temporarily repaired using aluminium tape. If the age of the spill is unknown or if the product has been contaminated with soil, debris, water, etc, gather up the spillage in small open buckets having a capacity no larger than about 5 litres (1 gallon).

Do not add more than about 0.5 kg (1 lb) to a bucket.

If on-site wet deactivation is not feasible, transport the uncovered buckets in open vehicles to a suitable area. Wear gloves.

Respiratory protection will most likely be required during cleanup of spilled magnesium phosphide fumigants. If the concentration of hydrogen phosphide is unknown, NIOSH/MSHA approved SCBA or its equivalent must be worn.

Small amounts of spillage, from about 2 to 4 kg (4 to 9 lbs) may be spread out over the ground in an open area to be deactivated by atmospheric moisture. Alternatively, spilled magnesium phosphide may be deactivated by the wet method as described in the following:

Wet deactivation:

1. Spilled magnesium phosphide fumigants may be deactivated with water. Do not use detergent for the deactivation of these products. Fill the container in which the deactivation is to be performed with water to within a few inches of the top.
2. The spilled material is added slowly to the water. Add weights or otherwise ensure that they stay submerged until deactivation is complete.
3. Due to the reactivity of magnesium phosphide, additions of spilled product to the water should be made slowly and carefully. This should be done in open air and respiratory protection will probably be required.
4. Allow the mixture to stand, with occasional stirring, for about 24 hours. Do not cover the container. The mixture will then be safe for disposal.
5. Dispose of the deactivated material, with or without preliminary decanting, at a sanitary landfill or other suitable site approved by local authorities. Where permissible, the slurry of spent dust from the tablets or pellets may be poured into a storm sewer or out onto the ground.

Precautions to be taken in handling and storage:

Store Magtoxin in a locked, dry, well-ventilated area away from heat. Signpost as a pesticide storage area. Do not store in building inhabited by humans or domestic animals.

Other precautions:

1. Do not allow water or other liquids to contact magnesium phosphide fumigants.
2. Do not pile up large quantities of magnesium phosphide products during fumigation or disposal.
3. Once exposed, do not confine the fumigant or otherwise allow hydrogen phosphide concentration to exceed the LEL.
4. Open containers of Magtoxin only in open air. Do not open in a flammable atmosphere. Hydrogen phosphide in the head space of containers may flash upon exposure to atmospheric oxygen.
5. See EPA approved labelling for additional precautions and directions for use.
6. Magtoxin is a restricted use pesticide due to acute inhalation toxicity of highly toxic hydrogen phosphide (phosphine PH_3) gas. For retail sale to and use only by certified applicators or persons under their direct supervision and only for those uses covered by the certified applicator's certification.



CONTROL MEASURES

Respiratory protection:

NIOSH/MSHA approved full-face mask with approved canister for phosphine (hydrogen phosphide, PH₃) may be worn at concentrations up to 15 ppm.

At levels above this, or where the hydrogen phosphide concentration is unknown, NIOSH MSHA approved SCBA or equivalent must be worn.

Protective clothing:

Wear gloves when handling magnesium phosphide tablets and pellets.

Eye protection:

None required.

Ventilation:

Local ventilation is generally adequate to reduce hydrogen phosphide levels in fumigated areas to below the TLV/TWA. Exhaust fans may be used to speed the aeration of silos, warehouses, shipholds, containers, etc.

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