



## **COMPLIANCE IN TERMS OF FUMIGATION AND PEST CONTROL®**

**AgBiz Grain  
June 2024**

**DR GERHARD H VERDOORN**

**© THIS PRESENTATION IS THE PROPERTY OF CROPLIFE SA AND MAY NOT  
BE ALTERED OR REPRODUCED IN ANY FORM**

# THEMES ADDRESSED DURING THE INFORMATION SHARING SESSION

Regulatory framework for pesticides and pest control in South Africa: Acts, Regulations and SA National Standards

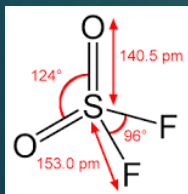
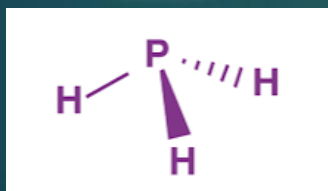
Pest control operator, assistant and general worker safety in terms on fumigation and pest control

Food safety and traceability of successive pest treatments of grain batches

Transportation and storage requirements and safety

Legal requirements for empty pesticide packaging and obsolete pesticides disposal

Pesticides used for grain fumigation and treatment



# Regulatory framework: 1

**The Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947)**

**Pest Control Operator Regulations of 21 February 2011  
Regulations for Agricultural Remedies of 25 August 2023**

## **Important Sections of Act No. 36 of 1947**

**Section 7(1): any product sold as a pesticide must be registered**

**Section 7(2)(a): any person offering pest control for financial gain must be registered as a pest control operator (PCO)**

**Section 7(2)(b): a pest control operator may only (sell) apply a pesticide according to its label instructions**

## **Important Regulations of Act No. 36 of 1947**

**R1716 of 26 July 1991 (use)  
R181 of 7 February 2003 (containers and labels)**

**PCO Regs 21 February 2011 (more later)**

**Regs for Agric Remedies 25 August 2023: restricted pesticides, safety information and training, label directed use**

# Regulatory framework: 2

## The Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) Hazardous Chemical Agents (HCA) Regulations of 29 March 2021

Most pesticides are  
classified as HCAs!

Important Principles  
in Act No. 85 of  
1993

Workplace safety  
Worker safety

Person holding  
registration of HCA

Person selling HCAs

Person employing  
workers to work with  
HCAs

Person applying  
HCAs

Client??

### Important Principles in Regs of 29 March 2021

All pesticide labels in GHS format from 1  
October 2023

All workers must be informed and  
trained on hazards of, and safe handling  
HCAs

All workers must be provided with  
appropriate PPE to work with HCAs  
All workers must undergo scheduled  
professional health checks

All clients must be informed of hazards  
of HCAs and safety precautions



# The Globally Harmonised System (GHS) format labels

## 2. SIGNAL WORDS

DANGER










OR

WARNING

3. Precautionary statements to inform the user about:

- Safe keeping
- Prevention (incl. PPE)
- Response (in case of exposure)
- Storage (requirements)
- Disposal (packaging & left-over stock)

## 1. HAZARD SYMBOLS & associated hazard statements

GHS01 Explosive 	GHS02 Flammable 	GHS03 Oxidising 
GHS04 Gas Under Pressure 	GHS05 Corrosive 	GHS06 Acute Toxic 
GHS07 Harmful / Irritant / Skin sensitiser 	GHS08 Carcinogen / Germ cell mutagen / Reproductive toxin 	GHS09 Hazardous to the aquatic environment 

4. Directions for use remain same as for WHO format labels

# Regulatory framework: 3

The Hazardous Substances Act, 1973 (Act No. 15 of 1973)  
Hazardous Substances (HS) Regulations of 14 November 1997 and Schedules of 12 August 1994

Important  
Principles in Act  
No. 15 of 1973

Scheduling of HS  
Conditions of sale  
Conditions of  
storage  
Conditions of  
record keeping

Licensing

Importer/manufactur  
er

Wholesaler

Retailer

Client??

Important Principles in Regs of 14  
November 1997

License required to sell Group I HS  
Double locking away of Group I HS  
Positive identification of buyer of  
Group I HS  
5-Year record keeping of buyers of  
Group I HS

Important Principles in Regs of 12  
August 1994

Pesticides with 6.1 toxicity GHS  
classification are scheduled as HS!

# Regulatory framework: 4

The National Road Traffic Act, 1996 (Act No. 93 of 1996) Chapter VIII, Regulations of 23 November 2005, and Dangerous goods classification according to SANS10231

Important Principles  
in Chapter VIII, Act  
No. 93 of 1996

Licensing of vehicles  
and vehicle safety  
features  
Training and  
certification of drivers  
that transport  
dangerous goods  
Load segregation  
DG declaration, SDSs  
and TREM cards

Dangerous goods  
classification  
SANS10231

Exempt quantities

Exemption for  
farmers



Important Principles in Regs of 23  
November 2005

Licensing of vehicles  
Training and licensing of drivers  
Knowledge and responsibilities of  
competent persons  
Link between consignor, consignee,  
operator and responsible person

SANS10231

Table C.1 with UN numbers, shipping  
names and corresponding primary  
and secondary danger classification

# Regulatory framework: 5

**The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), EPR Regulations of 21 November 2021, and EPR Scheme for the Pesticide Sector Regulation of 23 March 2023**

## **Important Principles in Act 59 of 2008**

**Any left-over pesticides and unrinsed packaging are classified as hazardous waste**

**Nominally empty pesticide packaging is classified as normal waste**

**No hazardous waste may be disposed of in landfill unless a special permit has been granted to do so**

**CropLife SA PRO  
19/7/5/P/PRO/202304  
28/038**

**77 Subscribers that pay waste management fees  
CLSA PRO is responsible for systems and infrastructure to collect, recycle or destroy empty packaging and left-over pesticides**

## **Important Principles in Regs of 21 November 2021 and 23 March 2023**

**All pesticide producers are compelled to register and participate in hazardous waste and packaging management  
Pesticide producers may manage their end-of-lifecycle packaging and pesticides collectively through a Product Responsibility Organisation which must be a not-for-profit company**



# Personal safety: PCOs and assistants

The Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)  
Hazardous Chemical Agents (HCA) Regulations of 29 March 2021 and pesticide product labels compel the use of personal protective equipment (PPE)

Level of PPE is determined  
by the nature of the  
pesticide that is applied

Minimum requirements:

Full body cover

Head cover

Foot cover

Hand cover

Eye protection

Nose/mouth protection

Employers must issue employees  
with appropriate PPE (it is the law)  
*Have a clause in the employment contract*  
Employees *must* wear PPE while  
working with hazardous materials  
PPE is personal and is the  
responsibility of the person who is  
issued with it, to wear it and take  
care of it

Not wearing PPE is one of the most  
severe occupational hazards

# Personal safety: PCOs and assistants



Cotton hat for  
spray operators



Cotton 1-piece or  
2-piece overall for  
spray operators



Tyvek or  
Tychem suits  
for fumigators  
and assistants



Respirator with  
chemical filters for  
fumigators and  
assistants



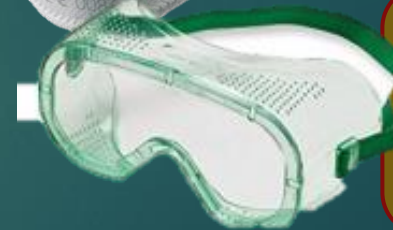
Calf length  
rubber boots  
with non-slip  
soles for all



Long neoprene or  
PVC chemical  
impervious gloves  
for all



Dust mask  
with filter for  
spray  
operators



Safety  
goggles for  
spray  
operators



Duct tape  
for sealing  
off sleeves  
and legs

# Correct fitting of personal protective equipment

## SEQUENCE OF FITTING PERSONAL PROTECTIVE CLOTHING

1. Overall and cotton hat, or suit with hoodie.
2. Boots with trouser legs draped **OVER** the boots and sealed with duct tape.
3. Respirator mask or dust mask and safety goggles.
4. Neoprene or PVC gloves with sleeves **OVER** gloves and sealed with duct tape.
5. Plastic slash proof apron (for mixers).

**WHEN WORKING WITH FUMIGANTS OR SEVERE SKIN IRRITANTS, ALWAYS ENSURE ALL NAKED SKIN IS TOTALLY COVERED**





# Forbidden actions while working with fumigants or other pesticides



Smoking, eating or drinking while working with fumigants or other pesticides is a definite way of introducing pesticides into the body because food, drinks and cigarettes are handled with contaminated hands

For ablutions: remove PPE, wash hands and face, and then use toilet

Correct protocol: plan application operation so that adequate breaks are available in the day's work. Remove PPE, wash hands and face, and then eat, drink or smoke (which is bad for you!)



# Personal decontamination after fumigation or other applications of pesticides



**WASH HANDS AND ARMS  
FOR 2 MINUTES WITH COLD  
WATER AND GENTLE SOAP**



**WASH FACE, NECK AND  
THROAT WITH COLD WATER  
AND GENTLE SOAP**



**FUMIGATORS AND ASSISTANTS  
SHOULD TAKE A COOL SHOWER  
WITH GENTLE SOAP**



**COLD WATER KEEPS SKIN PORES CLOSED AND PREVENTS PESTICIDE RESIDUES FROM ENTERING THE BODY; WARM WATER OPENS PORES AND ALLOWS PESTICIDE RESIDUES TO BE PENETRATE THE BODY**

**REMEMBER: NO PPE MAY BE TAKEN HOME!! IT MUST BE CLEANED AFTER WORK AND LEFT AT THE STORE IN A SECURE LOCKER**



# Health monitoring – both fumigator and assistant responsibility

Ideally undergo health screenings twice a year by a registered occupational health care practitioner

## Physical examination



Alcohol abuse, smoking, cannabis, and narcotics will produce false blood results and can seriously jeopardise ability to operate safely

Employer is obliged by law to withdraw worker from duty if blood samples or physicals show danger signs

## Blood sample analysis



YOU  
ARE  
FIRED

# Safety of other people while fumigating grain

**MAKE 100% SURE ALL PEOPLE HAVE EVAQUATED THE PREMISES!!!**

**No bystanders  
No observers  
No children  
No animals**



**Erect warning signs as required by the PCO regulations**

**If any people are close to the site in buildings or offices, inform them prior to the fumigation operation**

**Ensure all people understand the re-entry interval after fumigation**

**If PCO offers fumigation services to a third party, a pre-treatment notice must be issued in writing to ensure no one is present during and after the fumigation until it is safe**

## Post-treatment residue checks and traceability – food safety i.t.o. residues, fungal and insect pests

Residue analysis should be conducted after each treatment to determine if pesticides residues are within the MRL limits

MRL data (except sulfuryl fluoride) is on [www.agri-intel.com](http://www.agri-intel.com) or check CODEX Alimentarius data

Assign accredited laboratories for analyses that routinely do residue and mycotoxin analyses (repeatability is a key performance area)

Record keeping of treatments through the value chain of the commodity is very important to ensure food safety from MRL, insect pests and fungal infections

Burning question: is the grain storage industry keeping track of pesticide residues that are present on grain delivered at the silos?



# Transport requirements for dangerous goods

Only *bona fide* farmers who transport less than 1,000 units of pesticides as a mixed or single load, for no longer than 250 kms of which no more than 50 kms are on a national causeway, are exempted from the requirements of Chapter VIII of Act No. 93 of 1996

Commercial transport of pesticides  
All the fumigants are classified as primary or secondary toxic risk (class 6.1 and 2.3 (gas)) according to the SANS10231 with very limited or no exempt quantities

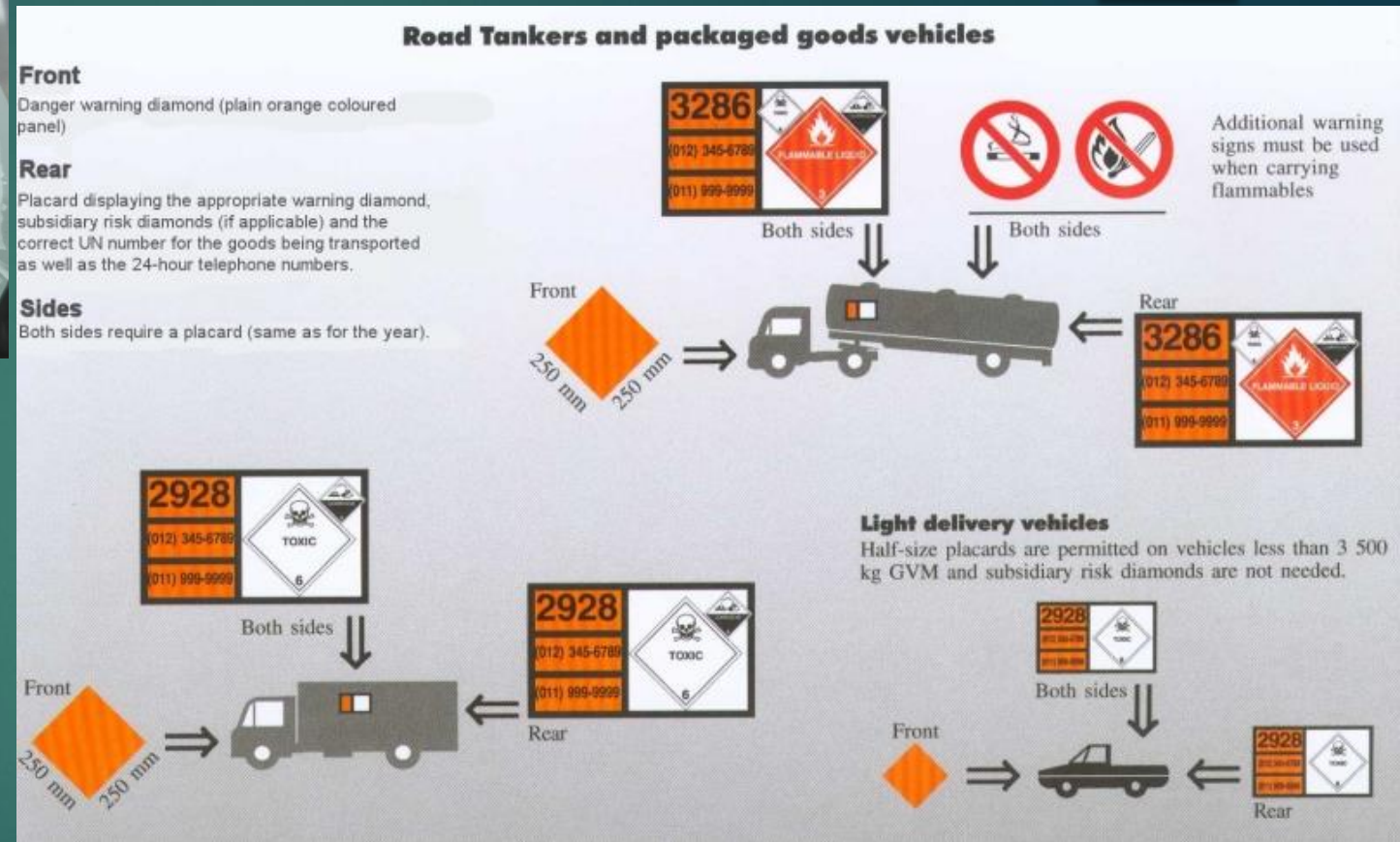
Safest is to have a vehicle licensed to transport dangerous goods and driver certified to transport dangerous goods (think about left-over materials that are automatically classified as hazardous waste)



Fumigant	UN number, P & S hazard class	Exempt quantity
Aluminium phosphide	3048 6.1	5 kg
Aluminium phosphide	1397 4.3 6.1	Nil
Magnesium phosphide	2011 4.3 6.1	Nil
Sulfuryl fluoride	2191 2.3	10 kg
Methyl bromide	1062 2.3	10 kg
Hydrogen cyanide	1051 6.1 3	5 kg

# Transport requirements – nothing other than ensuring safe transport of dangerous goods

The correct dangerous goods classification must be included in the orange diamond!!



Two emergency telephone numbers are required for transport emergencies: they may both be mobile numbers





# Safe storage of fumigants

Act No. 15 of 1973 demands double locking of pesticides classified as TOXIC (hazard class 6.1)



Double locking means a separate lockable facility inside the pesticides store

Storage security is of paramount importance due to the extreme hazards of the fumigants

Only authorised persons may enter storage facility

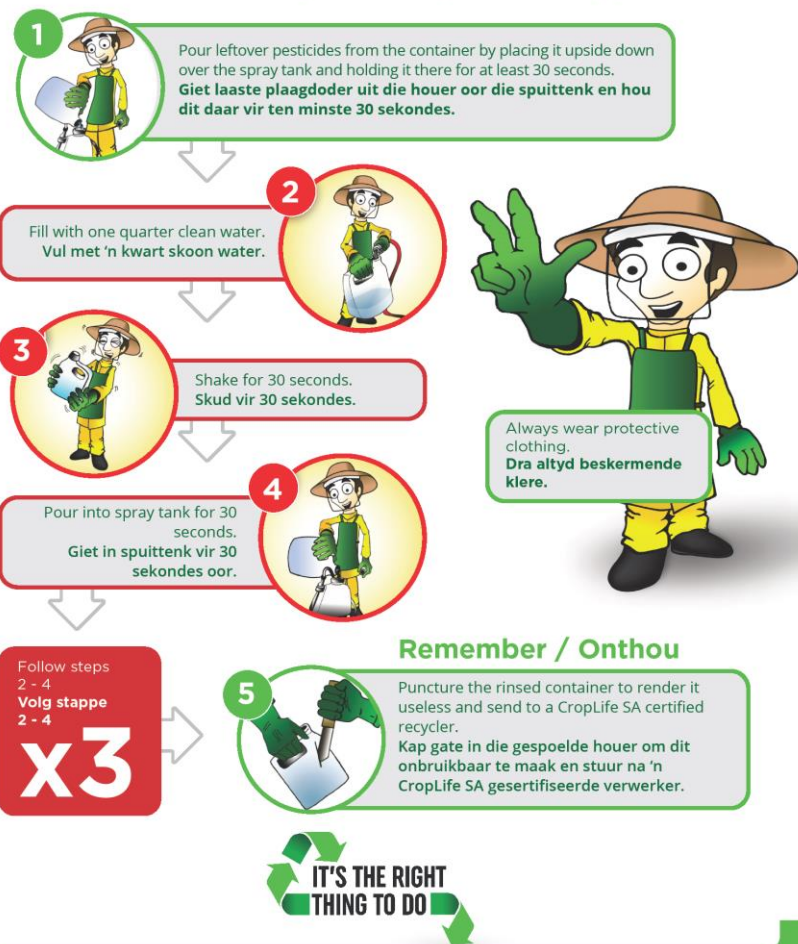
Since most fumigants are flammable or produce flammable gasses upon exposure to moisture, must the store be a flammable store where the fumigants are stored with other flammable pesticides (no other flammables, farm feeds or fertilizers)

# Decontamination of empty fumigant and pesticide packaging and carrier media

TRIPLE RINSE YOUR  
EMPTY PESTICIDE CONTAINERS /  
SPOEL JOU LEË PLAAGDODERHOUSERS DRIE KEER



Follow these steps | Volg hierdie stappe:



**NEVER REUSE EMPTY CONTAINERS OR BAGS FOR ANY PURPOSE OR GIVE THEM TO ANYONE ELSE**

**Triple rinse empty plastic containers and fuse all phosphides in aluminium containers by leaving full of water or submersing in water for at least four hours**

**Keep triple rinse empty plastic containers at a central point until sufficient numbers are available and arrange to be taken over by a CropLife SA Certified Recycler**

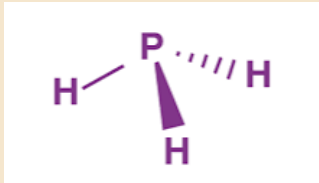



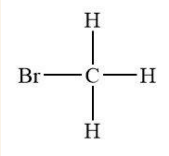




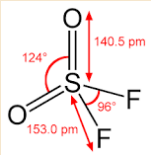








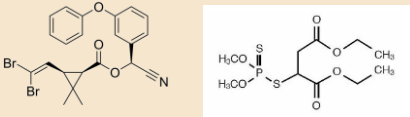


**Flatten decontaminated aluminium canisters at a central point until sufficient numbers are collected and arrange to be taken over by a CropLife SA Certified Recycler or sell to metal recyclers**

**Fuse all phosphides in plates, sheets or blankets by moistening in a properly ventilated area, leaving overnight and drying out in the sun; place in large LDPE bags and store centrally for safe disposal**

**Suppliers who are members of the CropLife SA PRO will provide large LDPE bags to registered PCOs who buy their phosphides from these suppliers (Degesch, Coopers, FarmAg, UPL-Ltd, Enviro Bio-Chem) to bag plates, sheets and blankets for safe disposal**



# Pesticides that are registered for grain treatment including fumigation

Pesticide	Molecule	Hazard class	Additional hazards	Risks (unskilled)
Aluminium and magnesium phosphide (phosphine)		Danger 		Very high 
Methylbromide		Danger 	 	High 
Sulfuryl fluoride (specialised equipment)		Danger 	 	Very high 
Hydrogen cyanide?	<b>HCN</b>	Danger 	 	Very high 
Pyrethroids and organophosphates (private use also)		Warning 		Low to moderate

**Discuss poisoning symptoms**

Steps	Emergency protocol to follow case of exposure to pesticides, especially fumigants
Step 1	Call the poison information centre <b>immediately</b> (e.g. 082-446-8946 or 0861-555-777) for emergency protocol advice AND do exactly as instructed by the specialist on call
Step 2	Do <b>NOT</b> give the patient <b>MILK</b> or anything else to drink or to eat, unless instructed so by the poison information centre; do NOT induce vomiting
Step 3	Take the patient away from the source of poisoning to a cool, safe place, well ventilated place and remove any contaminated clothing
Step 4	If the poison information centre advises to evacuate the patient to a hospital, do so IMMEDIATELY (with own transport or ambulance)
Step 5	Take any containers, labels or safety data sheets with the patient to the hospital
Step 6	Call the hospital beforehand to inform them a poisoned patient is on the way and give them the number of the poison information centre to consult on the pesticide, diagnosis, treatment and prognosis
<b>IMPORTANT</b>	<b>NEVER ATTEMPT SELF REMEDIATION; ONLY REGISTERED HEALTH CARE PRACTITIONERS MAY TREAT POISONED HUMAN PATIENTS</b>

## CONTACT DETAILS

**Dr Gerhard Verdoorn 082 446 8946**  
**[gerhard@croplife.co.za](mailto:gerhard@croplife.co.za)**