
# Pesticides

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## Introduction

Agricultural products are vulnerable to various pests that destroy crops. They account to huge loss of crop yields. This results in suffering for both the farmer and the workers. It becomes important for both the farmer and his workers to work together to ensure that crops are not destroyed. It is also important that they both work together to ensure that in the course of work activities workers are not exposed to risks that may cause ill health, injuries and even death. Therefore the knowledge and understanding of pesticides used in agriculture is an important step in applying good health and safety standards.

The application of pesticides affects workers and their families. Most farm workers and their families live on the farms or near the farms. Environmental problems are also caused by use, overuse or misuse of these pesticides.

## What are pesticides?

These are different forms of chemicals that are used in agriculture to kill pests and protect crops. Many people call them poisons. Others call pesticides agrochemicals, crop or plant protection products. The primary aim of pesticides is to control diseases, insects and weeds in agricultural crops. But these pesticides are also harmful to humans.

## What are agricultural pests?

There are different pests that destroy crops in agriculture such as:

- Weeds or unwanted plants
- Insects
- Rodents
- Fungi.

## Types of pesticides

Many different types of pesticides are used on farms. They are grouped (classified) according to their use" or pests they intend to kill. The following are the most common types used in South Africa:

- Herbicides - are meant to kill weeds
- Insecticides - are meant to kill insects
- Fungicides- are meant to kill fungi
- Rodenticides- are meant to kill rats, mice and other pest species of rodents.



These different pesticides are applied in agricultural activities such as weed killing, crop protection, stock protection, soil fumigation, stock disinfection, etc.

## Forms of pesticides

There are three main forms of pesticides. They are:

- Liquids – usually mixed with water and then sprayed
- Solids - usually they are pastes, pellets, dust and powder and may be applied directly as solids. They may also be turned into other forms
- Gases- usually they are tiny particles.

## Effects of pesticides

Use, overuse and misuse of pesticides have effects on humans and the environment. Their effects on humans are either acute or chronic effects causing some of the following:

- Damage to the nerves
- Damage to the lungs
- Cancer
- Sterility
- Birth defects
- Allergic reactions
- Fatal poisoning.

In short, they cause injuries, ill health, death and environmental degradation. It therefore becomes necessary to understand how pesticides enter the human body.

## How pesticides enter the body (routes of entry)

Pesticides enter human bodies through four main ways. Most people call this the chemical route of entry.

### The four routes of entry are:

- Through the skin – It is called absorption or dermal. The pesticides enter the body through the pores used for releasing sweat from the body. It usually happens when a worker mixes or sprays pesticides or becomes exposed without wearing suitable personal protective clothing

- Through the mouth by swallowing - It is called ingestion or oral. This normally happens when eating food and drinks on the field or dust swallowed with saliva or smoking cigarettes. Sometimes chemical containers are used to carry drinking water

- By breathing in fumes or vapours – Most people calls it inhalation. The pesticides are breathed in as dust, fumes, vapours or gasses especially if not wearing suitable personal protective equipment

- Through the eyes- This is called ocular. In mixing or spraying work activities without suitable protective clothing, splashes of dust or vapours may enter through the eyes.



## Prevention and control

Some of the steps that are import in the prevention and control of pesticides hazards are outlined as follows:

The wearing of personal protection equipment (PPE) is of absolute importance at all times when pesticides are used.

### 1. The first step before the use of pesticides is for the employer to do a risk assessment

- Identify potential hazards
- Evaluate the risks
- Work out suitable preventive and control measures.

### 2. Eliminate the risk

- Use another method other than pesticide to deal with pests
- Use a pesticide that is less hazardous.

### 3. Control the risk

Use technical and engineering controls such as:

- Sealed mixing and filling systems for tractor-mounted spraying
- Pesticides with tractor cabs fitted with approved, charcoal-based pesticides filters which absorbs it when it enters into the cab.



### 4. Safe system of work

Put in place a safe system of work such as:

- Workers are removed from areas before beginning of spraying
- Re-entry periods are known and adhered to
- The spray equipment are regularly checked to ensure that they are in good working order and properly calibrated
- Ensure effective supervision
- Health and safety legal standards are adhered to.

## 5. Information and training

- Ensure that all workers are trained on occupational health and safety
- Those specifically working with pesticides are given special training on equipment and pesticides they use. They are trained on hazards associated with pesticides and risk prevention/control measures
- Workers should be trained on information on labels and Material Safety Data Sheets (MSDS). Ensure that pesticides are supplied with and are in the language understandable by the user. Labels contain the information:

***Labels, usually stuck directly on to containers have some of the following information:***

1. Product information : trade/brand name; manufacturer/supplier's name; addresses; type of formulation; emergency phone numbers.
2. Hazardous ingredients: active ingredients; other chemical formulation; all identified by a chemical name(s).
3. Toxicological properties: health effects; environmental effects; hazard warning symbols.
4. User information: direction for use; dose rates; mixing instructions; application rates; approved tank mixes.
5. Environmental/crop/pest information: range of crops; types of livestock; pest range; tolerant or resistance species; warning on possible crop damage; harvest intervals.
6. Precaution/preventive measures: technical/ engineering control; other safety information; medical advice or warning; washing and disposal of containers.
7. Operator protective measures.
8. First aid measures.

MSDS can be obtained free of charge from the manufacturer, importer or supplier of the product. They are not automatically supplied with the product.

The main information in MSDS is the following:

1. Product information: trade/brand name, manufacturer/suppliers names and addresses, and emergency phone numbers.
2. Hazardous ingredients: active ingredients by chemical(s) name(s).
3. Physical data.
4. Fire or explosion data.
5. Reactivity data: information on the chemical instability of the product and substances it may react with.
6. Toxicological properties: health and environmental effects.
7. Preventive/control measures.
8. First Aid measures.
9. Preparation information: Who is responsible for preparation and data of preparation of the MSDS.

Does the pesticide pose problems to the livestock and the environment (fish, rivers, birds, bees, or other water sources)?
Is it possible to damage neighbouring crops and/or villages.

### 6. Hygiene and health surveillance

- Provision of suitable washing facilities on the farm/plantation yard where users could wash themselves after spraying
- Availability of First Aid facilities.

### 7. Provision, use, and maintenance/replacement of personal protective equipment

Personal protective equipment (PPE) includes any clothes, material or devices meant to protect exposure to pesticides.

This is the least effective means of protecting workers against risks and it complements other methods of control. These include the following:

- Gloves
- Apron
- Boots
- Face shield
- Head gear
- Respiratory protective equipment (RPE).

## Other key points when working with pesticides

### 1. Transfer/decanting

- Discourage repackaging of pesticides under any circumstances
- In case those pesticides are transferred into another container, it should only be done by trained workers under suitable supervision
- The new container must then be appropriately labelled.

### 2. Transport

When transporting pesticides on the farm, ensure:

- That random stacking is avoided
- Pesticides are separated from other materials and people
- Pesticides are not carried alongside the driver in the vehicle/tractor cab.

### 3. Storage

Pesticides should have a well constructed store that is properly maintained with a safe system of work for those who access it.

The following are key points for storage:

- Site to allow easy access for delivery and loading
- Storage facilities must be constructed away from houses, livestock, flammable materials and water or areas liable for flooding
- Separated from stocks such as fertilizers, flammable materials and crops/food
- Provided with natural ventilation
- Fitted with strong and durable shelving.

### 4. Disposal

Proper disposal of pesticides is encouraged. Leaving pesticides in the field or dumping them in watercourses is not allowed.

Some of the key points in disposal of pesticides:

- All containers should be rinsed out, at least three times and the washings disposed
- Storage of containers before disposal should be well defined in a demarcated area
- Labels should not be disfigured.

Leaving pesticides in the field or dumping them in watercourses is not allowed.

## References


The following sources were used for the development of this pamphlet:

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2. IUF Health and Safety training material.
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4. African Newsletter on Occupational Health and Safety.

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