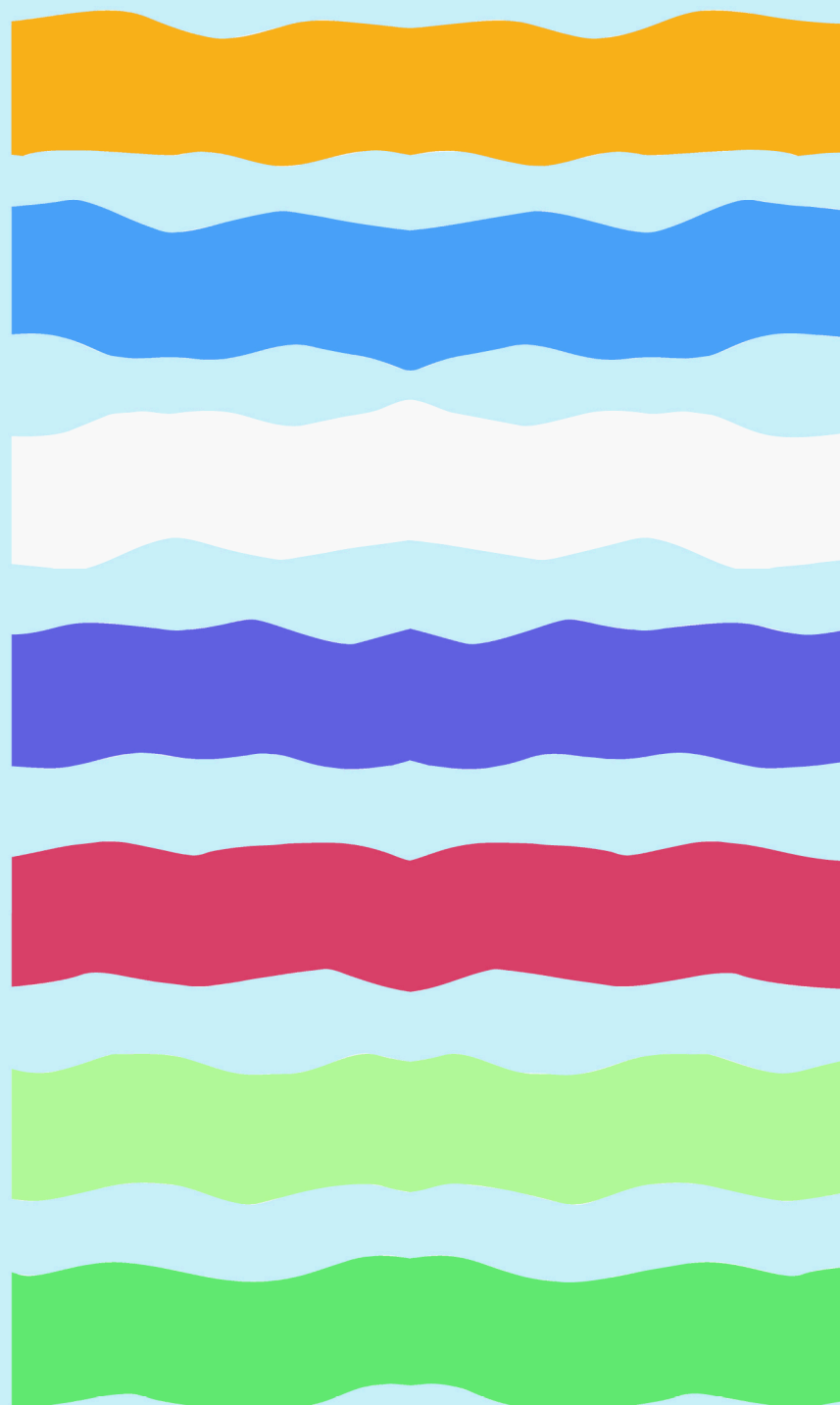


Protecting Workers'
Health Series N° 1

PREVENTING HEALTH RISKS FROM THE USE OF PESTICIDES IN AGRICULTURE

This booklet can be obtained from:
World Health Organization
Occupational and Environmental Health
CH-1211 Geneva 27
Switzerland



Protecting Workers' Health Series n° 1

Preventing Health Risks from the Use of Pesticides in Agriculture

Antonella Fait

Bent Iversen

Manuela Tiramani

Sara Visentin

Marco Maroni

International Centre for Pesticide Safety

Via Magenta, 25

20020 Busto Garolfo (Mi)

Italy

Co-author

Fengsheng He

Institute of Occupational Medicine

Chinese Academy of Preventive Medicine

People's Republic of China

Edited by

International Centre for Pesticide Safety

Cover page layout

Tuula Solasaari-Pekki, Finnish Institute of Occupational Health

©2001 World Health Organization

This document is not a formal publication of the World Health Organization and all rights are reserved by the Organization. The document may, however, be freely reviewed, abstracted, or reproduced or translated in part or in full, but not for sale or for use in conjunction with commercial purposes.

For authorisation to reproduce or translate the work in full, and for any use by commercial entities, applications and enquiries should be addressed to the Department for Protection of the Human Environment, World Health Organization, Geneva, Switzerland, which will be glad to provide the latest information on any changes made to the text, plans for new editions, and the reprints, adaptations and translations already available.

CONTENTS

Pesticides	6
Labelling/Classification	8
Exposure	10
Health problems	12
First-aid	14
Personal protective equipment	16
Transport	18
Storage	20
Mixing/loading	22
Application/spraying	24
Spillage	26
Post-application	28
Disposal	30
Further information	32
Further readings	35

PREFACE

This document is the first in a series of occupational health documents entitled: Protecting Workers' Health. It is published by the World Health Organization (WHO) within the Global Programme of Occupational Health. It is the result of the implementation effort of the Global Strategy on Occupational Health for All as agreed upon at the Fourth Network Meeting of the WHO Collaborating Centres in Occupational Health which was held in Espoo, Finland from 7-9 June 1999.

The text was prepared by the International Centre for Pesticide Safety of Milan (Italy) in close co-operation with the Institute of Occupational Medicine, Chinese Academy of Preventive Medicine of Beijing (China), acting as WHO Collaborating Centres for Occupational Health.

The application of pesticides on crops is necessary to prevent unacceptable losses of the agricultural production. However, their use may pose health risks to the farmers and pesticide workers, often as a consequence of improper or careless handling.

This booklet is written to give advice on how these health risks can be reduced. It gives a short introduction on pesticides and labelling/classification systems, a description of how exposure may take place and information on related health problems. It also provides practical advice on proper working procedures for mixing/loading, application, transportation, storage and disposal of the pesticides.

The document is published with the intent to promote health and safety of workers engaged in agriculture. It is targeted for use by workers all over the world, especially for those countries still under development where agriculture is the main source of sustenance and technology. The document is also meant to serve as a tool to help health professionals and pest managers in promoting safe working procedures.

In order to reach a broad and heterogeneous audience, the decision of the editorial team during the preparation was to deliver basic information, to make

extensive use of simple statements, and to provide illustrations as supplements or alternatives to text.

WHO offers special acknowledgement to the authors of the document and to the experts of the WHO Collaborating Centers, who provided assistance in reviewing the drafts of the manuscript. These are listed below:

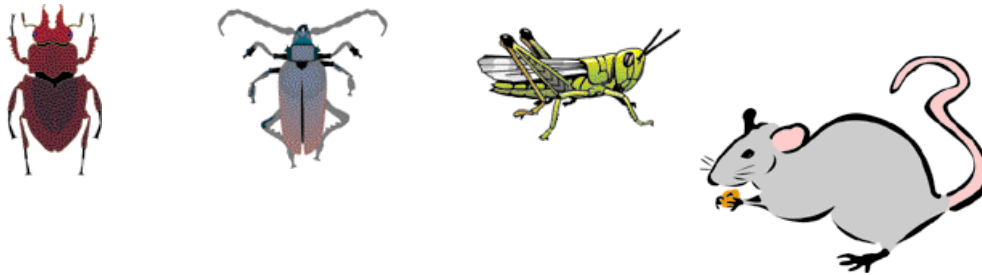
Dr. Paul A. Schulte, National Institute for Occupational Safety & Health, USA; Prof. Alain Domont, Club Européen de la Santé, France; Dr Timothy Wai-Hoong Phoon, Department of Industrial Health, Ministry of Labour, Singapore; Dr. Joop J. Van Hemmen, TNO Work and Employment, The Netherlands; Dr. Rathavuth Sumke, Division of Occupational Health, Department of Health Ministry of Public Health, Thailand; Dr Nikolai F. Izmerov, Institute of Occupational Health, Russian Academy of Medical Sciences, Russian Federation; Prof. Maria Tasheva, National Centre of Hygiene, Academy of Medicine, Medical Ecology & Nutrition, Bulgaria; Prof. Robert F.M. Herber, Coronel Laboratory for Occupational & Environmental Health, Faculty of Medicine, University of Amsterdam, The Netherlands; Dr Fritz Kochan, Federal Institute of Occupational Safety & Health (FIOSH) (BAuA), Germany; Dr. Gustavo Molina, Department of Occupational Health and Environmental Contamination, Institute of Public Health, Chile; Dr Kerr Wilson, Biomedical Sciences Group, Health & Safety Laboratory, Health & Safety Executive, United Kingdom of Great Britain and Northern Ireland; Prof. Michel Guillemin, Institut Universitaire Romand de Santé au Travail (IST), Université de Lausanne, Switzerland; Dr. Srmena Krstev, Institute of Occupational & Radiological Health, Yugoslavia;

Dr Miroslav Cikrt, Centre of Industrial Hygiene & Occupational Diseases, National Institute of Public Health, Czech Republic; Dr. Michèle Paquette, Occupational Health and Safety Commission, Canada; Dr. Jenny Pronczuk, WHO/PCS; Dr. Nida Besbelli, WHO/PCS; Dr. J. Bartram, WHO/WSH.

PESTICIDES

Pesticide is the name used to describe a range of substances or mixtures used to kill, reduce or repel many types of pests. The substances are named according to the type of pest they control, such as;

- Insecticides are used against insects.
- Herbicides are used against weeds.
- Fungicides are used against fungi and molds.
- Rodenticides are used against rodents.
- Molluscicides are used against molluscs.



**MOST PESTICIDES ARE TOXIC AND COULD CAUSE ILL-EFFECTS
IN YOUR BODY !!!!**

IMPORTANT

- Ask for advice to choose the best and least hazardous pesticide.
- Be sure that the pesticide you buy is exactly what you need.
- Try to use less pesticides: it saves money, and reduces health risks.
- Using more pesticide than recommended by the manufactures does not increase the crop yield.
- Crop rotation is very useful to control pests.
- Substitute non-resistant plants with pest-resistant ones.
- Reduce the need for pesticides by using substitutes such as biological control of insects or natural predators which are harmless to the crop.
- In cases of limited pest infestation, traps or manual removal could substitute for pesticides.

QUESTIONS AND ANSWERS

"What is Integrated Pest Management (IPM)?"

"IPM means Integrated Pest Management. IPM contributes to pesticide risk reduction by: reducing reliance on chemical pesticides and encouraging the use of non-chemical alternatives, encouraging the use of reduced-risk pesticides when pesticide treatment is necessary, preventing pest problems through better crop management and maintenance of natural resources, and by increasing farmer knowledge about agricultural pests and ecosystems."

"Are all pesticides liquids?"

"Not at all. Pesticides can be solids, applied either undiluted as dust, granules or from a smoke generator, or diluted as wettable powder, bait concentrate or soluble grain. As liquids they can be applied undiluted as aerosols, or as diluted emulsifiable concentrate or suspension concentrate".

DID YOU KNOW THAT



..there are many classes of pesticides according to use and to chemical composition.

Insecticides	Herbicides	Fungicides	Rodenticides
Organophosphates	Chlorophenoxy compounds	Substituted benzenes	Inorganics
Carbamates	Pentachlorophenol	Thiocarbamates	Coumarins / indandiones
Organochlorines	Nitrophenolic/crenolic compounds	Ethylene bis dithiocarbamates	Convulsants
Pyrethrins and pyrethroids	Paraquat, Diquat	Thiophthalimides	Cholecalciferol
Arsenical compounds and other	Arsenical compounds and other	Organo-metallic compounds	

LABELLING/CLASSIFICATION

Pesticides are classified/labelled by hazard.

European toxicological classification system (1995) of pesticides.

	Classification	Shortened form
	Highly toxic	T+
	Toxic	T
	Harmful	Xn
	Irritant	Xi

flammable



corrosive



explosive



IMPORTANT

- Keep always the pesticide in the original container.
- Ensure the label is readable.
- The label normally contains information for the correct and safe use of the pesticide.
- It is always important to read the product label carefully.
- In case of an accident, the information on the label may help you.
- Ask the retailer for a chemical safety data sheet, and get help if you can not understand the information given.
- The label should be in the local language - understandable to users.

QUESTIONS AND ANSWERS

"Do all countries use the same classification system?"

"No, different classification systems are used, and not all labels will be satisfactory"

"What is the classification used by the World Health Organization?"

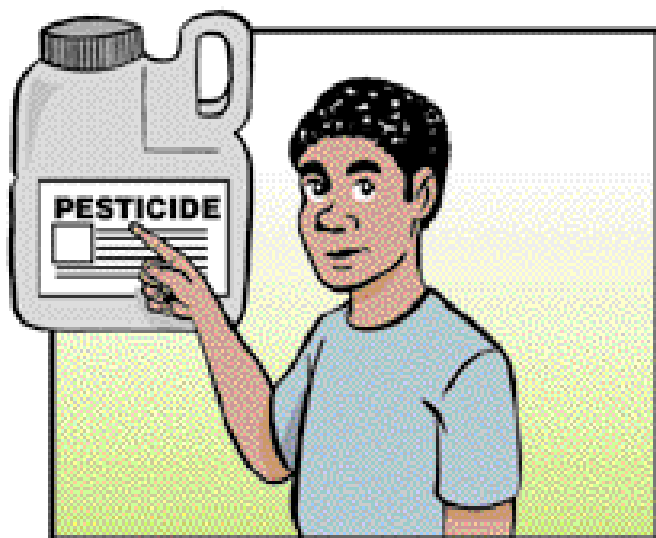
"The WHO classification is widely used, and is given below".

Class	Text
Ia	Extremely hazardous
Ib	Highly hazardous
II	Moderately hazardous
III	Slightly hazardous

DID YOU KNOW THAT

You can find the information about toxicity, symptoms of poisoning, first aid etc. on the product label or on the material safety data sheet (MSDS) obtained from the retailer.

MSDS (Material Safety Data Sheets) - Is an information sheet provided by a pesticide manufacturer describing chemical qualities, hazards, safety precautions, and emergency procedures to be followed in case of a spill, fire, or other emergency.



READ THE LABEL !!

EXPOSURE

Farmers and bystanders are exposed to pesticides in many different situations such as:

- Mixing/loading
- Application (spraying)
- Selling, transporting and storing
- Taking care of the equipment.
- Re-entry into the field
- Spillage
- Disposal

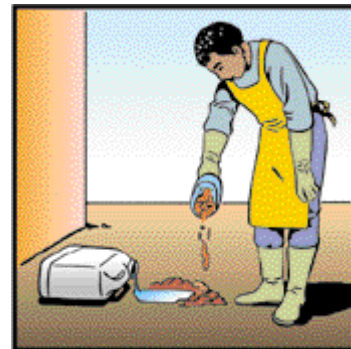
**NOT ONLY YOU BUT ALSO PEOPLE STANDING OR LIVING NEARBY
COULD BE SERIOUSLY POISONED !!!**



Mixing/loading



Application



Spillage

IMPORTANT

- The total exposure of a farmer to pesticides is the sum of all exposures resulting during different working situations.
- No working situation is safe, so precautions to avoid exposure should be taken.
- Exposure, even if it creates a risk of intoxication, may often be unnoticed by the farmer at the time it is happening.
- Stop work immediately if you suspect a hazardous exposure has taken place.
- Pesticides could persist, being dangerous long time after spraying.

QUESTIONS AND ANSWERS

“Which situations have the highest exposure risk?”

“In general the exposure is highest when the pesticide is concentrated, or you are very near to the product

For example,

- *handling the concentrated product;*
- *opening containers;*
- *weighing product;*
- *mixing;*
- *loading*
- *spraying*
- *re-entry.”*

DID YOU KNOW THAT

Frequent applications and use of several pesticides could enhance the toxicity!

When you use pesticides in enclosed spaces, you increase the risk of being exposed to the pesticide by inhalation.

So-called empty pesticide containers are not really empty, there will always be a small residue of pesticides, which represents a risk if containers are re-used (e.g. for carrying water).

A pesticide can enter the body also through the skin.

In hot weather sweating increases skin absorption.

HEALTH PROBLEMS

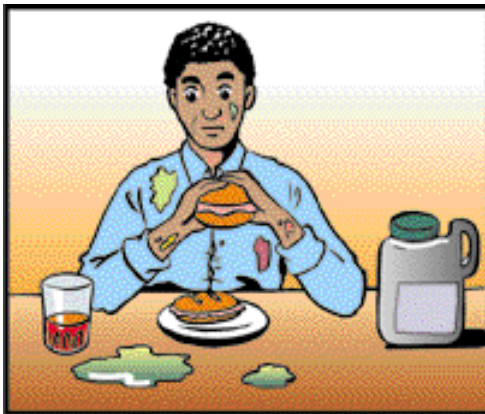
PESTICIDES ARE HAZARDS

The three major routes in which pesticides may enter your body are:

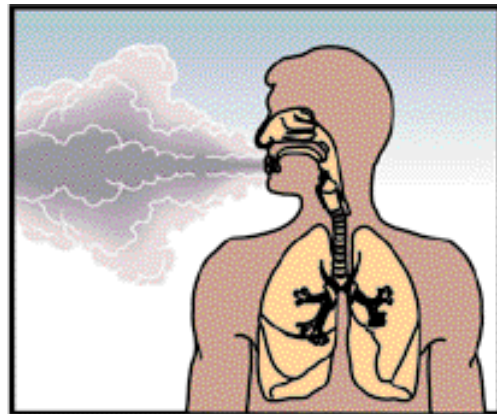
- Through the skin
- Through breathing
- Through the mouth



Pesticides go through the skin



Pesticides can be eaten



Pesticides can be inhaled

PESTICIDES CAN COME INTO YOUR BODY THROUGH THE SKIN, ALSO WITHOUT ANY SIGN ON THE SKIN !!!

IMPORTANT

- See a doctor if you do not feel well. Tell him you work with pesticides.
- Do not eat, drink or smoke in working areas.
- Complaints after exposure could be confused with other illnesses such as flu or heat stress.
- After use, wash at least your face and hands before eating, drinking, smoking or going to the toilet.

QUESTIONS AND ANSWERS

"Where on the body does skin absorption take place?"

"Unclothed or unprotected area of the body, such as face and hands, but also through the clothes if they do not protect properly. Skin absorption is the most common route of poisoning".

"When is the risk for intoxication by inhalation greatest?"

"When highly toxic pesticides are sprayed indoor without appropriate ventilation. When fumigants and gases are used. At higher ambient temperatures".

"How can pesticides be ingested?"

"Exposure by ingestion is less common than by skin or inhalation, but it can occur through accidental poisoning or by eating/handling pesticide-contaminated food".

DID YOU KNOW THAT

Signs and symptoms are highly variable for different substances. Health professional in your area should have information about health effects of pesticides, their diagnosis and management.

Health effects could be acute, delayed or chronic.

Many pesticides cause allergic effects.

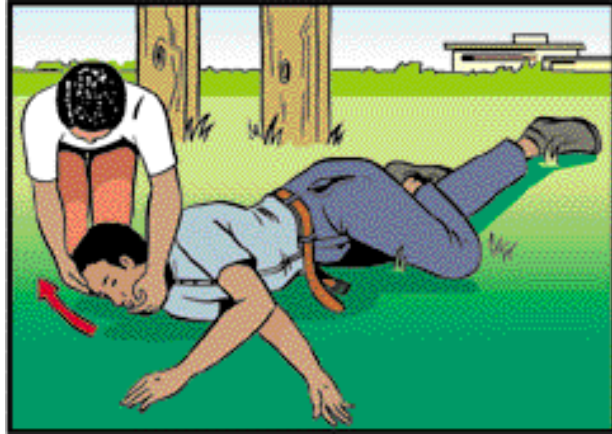
Blistering and peeling of the skin could be the result of direct dermal exposure.

FIRST-AID

STOP EXPOSURE !!!!

First aid has three main objectives:

- to preserve life;
- to prevent the condition from worsening;
- to promote recovery.



If the worker becomes unconscious, place him in the recovery position with the head turned to one side and the tongue forward

CALL:

Doctor

Ambulance

Hospital

IMPORTANT

- Call a doctor or an ambulance. Give the doctor as much information about the pesticide as possible: provide the container and the pesticide label.
- Remove the patient/worker to an uncontaminated and well-ventilated place.
- If the poisoned worker becomes unconscious, place the worker on his/her side with the head turned to the left and the tongue forward so that any vomit or other fluid from the mouth will drain freely.
- Remove contaminated clothing and place them in a plastic bag, avoiding self-contamination.
- Flush contaminated skin with plenty of water. If eyes are contaminated hold the eyelids open and wash them out with fresh clean water for at least ten minutes.
- If breathing stops or weakness, turn the patient's face upwards and ensure that the airway is clear.
- First aid personnel should wear plastic gloves and avoid contamination.

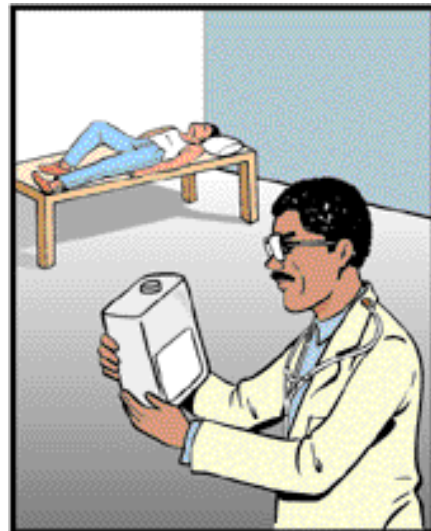
QUESTIONS AND ANSWERS

“Can I use antidotes?”

“Only a few pesticides have antidotes. The label will indicate their use, but only qualified professionals should use them, and know where to obtain them”.



Remove immediately contaminated clothing and wash skin



If possible show the doctor the container and the pesticide label

DID YOU KNOW THAT

In most places it is possible to contact the local Poison Information Centre or hospital (e.g. emergency room), to obtain more detailed information on how to act in case of poisoning.

Oral ingestion is rare, but when it happens is dangerous, and the person should be transported to hospital.

PERSONAL PROTECTIVE EQUIPMENT

You can reduce contamination if you use proper personal protection equipment.

- Head protection
- Eye and face protection
- Respiratory protection
- Protective gloves
- Protective clothes
- Protective footwear



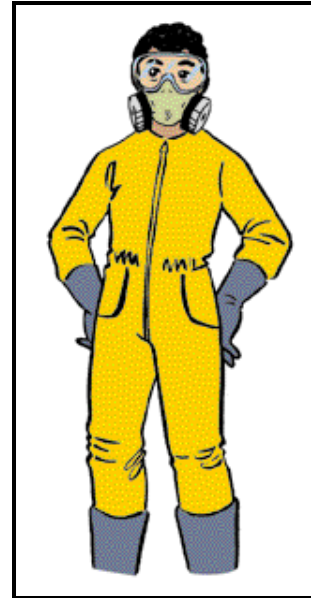
Goggles



Boots



Gauntlet gloves



IMPORTANT

- Respirators should be of a type approved by the responsible authority, and be fitted with appropriate filter or cartridge in good conditions.
- Protective equipment should be in a good condition and fit well.
- Filter or cartridge should be changed at the specified time.
- Gloves must be protective, fit the hands comfortably and be flexible enough to grip pesticide containers firmly
- Gloves and boots should be washed before removal to avoid self-contamination.
- The clothes should be resistant against the pesticides used, ask for advice.
- Garments should be washable, and washing be separated from normal clothes.
- Protective clothing should be stored in a clean, dry and well-ventilated room separated from other clothing or living accommodation.
- Avoid contaminating work clothes by protective equipment.
- Use personal protective equipment even on a hot and humid day!!

QUESTIONS AND ANSWERS

"Are there guidelines for personal protective equipment?"

"Yes, for instance Food and Agriculture Organization of the United Nations (FAO) has provided a Guideline for personal protection when working with pesticides in tropical climates".

"How do I wash my working clothes?"

"Wash them after use but separately from other clothing, the inside of cleaned gloves and boot should be washed with water and detergent, rinsed and allowed to dry".

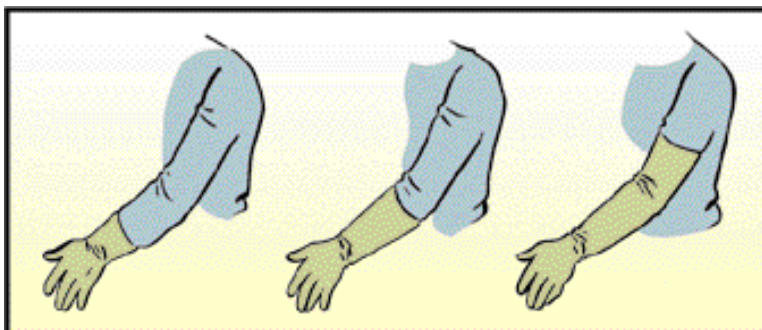
Gloves should be changed at regular intervals.



Wash boots before removal

DID YOU KNOW THAT

There are different types of protective gloves. They could be made of i.e. natural rubber, synthetic rubber, plastic and other materials. Each of these materials has its own characteristics, with varying breakthrough times for agrochemicals. Gloves could easily be damaged by acids or organic solvents. It is therefore necessary to inspect gloves before use, and to be sure that they give the wanted



Wrist length gloves Elbow length gloves Shoulder length

protection. The length of the gloves depends on the work to be done. Dipping plants in pesticides may be done with shoulder length gloves, and spraying of pesticides with wrist-length gloves. Gloves should be changed at regular intervals.

TRANSPORT

The transport of pesticides is a very delicate matter and should be done carefully. The vehicle used should be adapted to this type of transport, and guarantee the safe transportation of the cargo.



If it is not possible to transport pesticides as only load, then keep them away from passengers and the remainder of the load

IN CASE OF A TRAFFIC ACCIDENT CALL:

Police:

Fire personnel

Rescue personnel

IMPORTANT

- Do not transport pesticides with other materials, especially with food.
- Use personal protective equipment and clothing when you load and unload the vehicle.
- Ensure loads are adequately secured.
- Loads should be protected from rain and excessive sunlight.
- Be sure that there is no sharp material which can damage the containers and result in leaching of pesticides.
- Information provided with the pesticides such as labels and data sheets should always be in the vehicle.
- In case of a traffic accident during transport, give necessary information about the products to the police or health authorities, call the police, and keep other people away from the accident.
- Bring along appropriate protective clothing.

QUESTIONS AND ANSWERS

“Are there special rules for the transport of pesticides?”

“Yes, in many countries the transport of pesticides is subject to laws and regulations. So always consult authorities if you do not know the existing law”.



Do NOT buy or transport damaged packs

DID YOU KNOW THAT

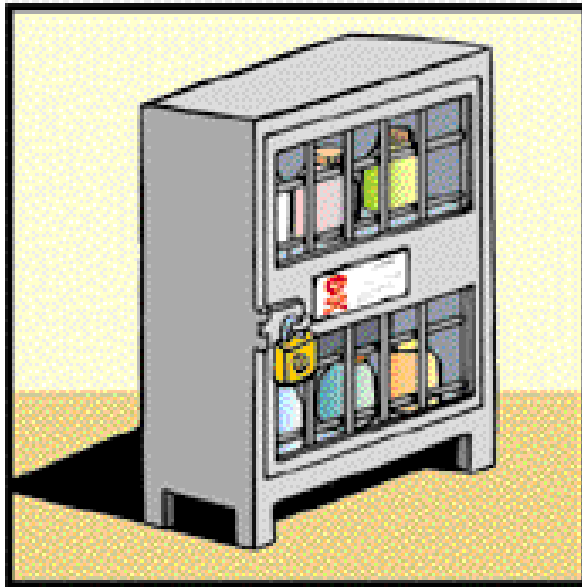
Random stacking can easily cause problems during transport. Containers with liquids should be loaded top-side up on vehicle, and not be subject to high pressure from excessive load which can damage them. It is therefore a good idea to check the pesticide load at intervals during transportation. Be also aware that labels can be rubbed off during the transportation.

After transportation the containers should be checked for leaks and loose lids, and immediately repacked if necessary. Unreadable labels should be replaced.

Children or careless adults could be poisoned if you leave your vehicle unattended when transporting pesticides.

STORAGE

The person who buys and uses pesticides is also responsible for correct storage.



Store pesticides separately and in a secure way, under bay

IMPORTANT

- Buy and store only the smallest amount of pesticide needed.
- Always keep your pesticides in their original container(s) with the label(s) attached.
- Follow storage instruction on the container label.
- Pesticides should be stored in a well-ventilated, cool and dark place. Avoid high temperatures and frost.
- Be sure storage shelves are strong enough.
- Put a warning sign on the door, indicating that pesticides are stored.
- Do not expose pesticides containers to direct sunlight.
- Store pesticides out of the reach of children.
- Prohibit access to unauthorised persons.
- Never store food products and pesticides together.

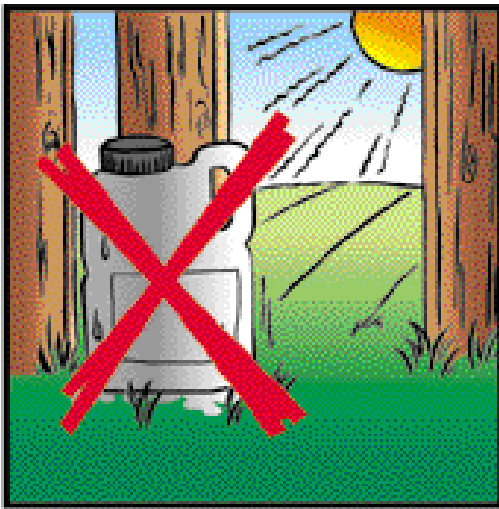
QUESTIONS AND ANSWERS

"How long can I keep pesticides stored?"

"It is explained on the label. If you have any doubt about how to store pesticides and for how long, then ask for advice from the dealer".

"Why is very high temperature a problem?"

"Because it can destroy the containers and degrade the pesticides".



Avoid high temperatures

DID YOU KNOW THAT

Many children and other persons have been severely injured or killed because they ingested pesticides stored in food or drink bottles, or left over in containers that were not appropriate (e.g. soft drink bottles)!



Keep locked out of reach of children

MIXING/LOADING

The type of equipment used depends on the area to be treated and the form in which the pesticide is applied. The risk for poisoning during mixing and loading could be high, because concentrated product is handled.



Wear personal protective equipment during mixing/loading

IMPORTANT

- Handling of pesticides before application should only be done by trained people.
- Personal protective equipment should be used as specified on the label.
- Read the users' manual before loading the application equipment. Ask for advice if it is not clearly understood.
- Avoid leaking and spilling, but if it happens be ready to clean the area immediately.
- Know what to do in case of emergencies.
- Keep children away.
- Inform people and family members nearby to keep a safe distance.
- Never measure or pour concentrated pesticides without gloves, even if the quantity seems to be very limited.
- Do not eat, drink or smoke during mixing and loading.
- Do not re-pack or transfer pesticides to other containers.
- Never use hands as scoops.

QUESTIONS AND ANSWERS

"Can I mix and load pesticides under all weather conditions?"

"No, if the weather conditions do not allow application of the pesticide i.e. too heavy wind causing spray drift, then the mixing and loading should not be done"

"What is the advantage of closed systems?"

"If the spray tank is filled by a closed system, then the risk of exposure is much lower".

"Should I prepare the pesticide solution indoor?"

"No, absolutely not, you should always mix pesticides outdoor, or in a well ventilated area".



Wash equipment after use

DID YOU KNOW THAT

Many pesticides can be mixed and used together, but ensure that only appropriate pesticides mixtures are prepared.

Ensure that an emergency supply of fresh water is available for washing yourself in case of an accident.

APPLICATION/SPRAYING

Pesticides can be applied in many different ways, depending on the crop, the area and the equipment available. Care should be taken regardless of the method of application.

DO NOT ALLOW CHILDREN TO SPRAY PESTICIDES !!



Do not spray against the wind



Do not use leaking or defective equipment

IMPORTANT

- Only qualified persons are allowed to apply pesticides.
- Children shall not apply pesticides.
- Other workers should not be in the field during application.
- Follow the label instructions and ask for advice if you do not understand them.
- Do not use leaking or defective equipment.
- The equipment should be checked and assembled properly.
- Be aware of the wind. Do not spray against the wind.
- Do not apply pesticides when it is raining.
- Keep people and animals out of freshly treated crops.
- Do not blow the knapsack nozzles if blocked.
- Do not walk through sprayed foliage.
- Never leave pesticides and equipment unattended.

QUESTIONS AND ANSWERS



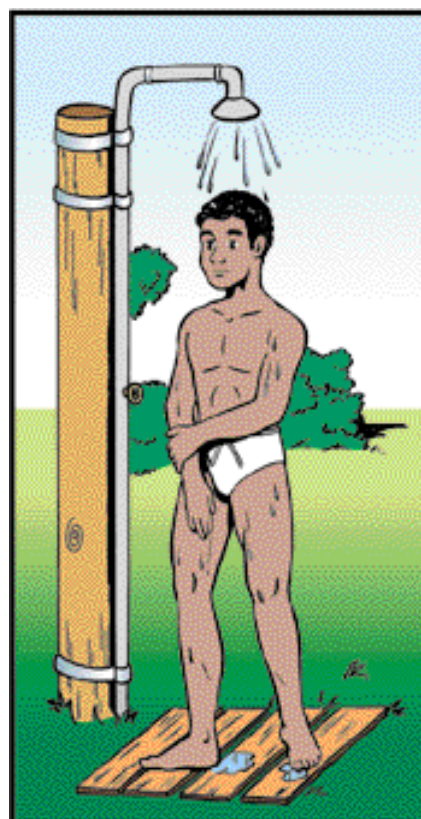
Read the label!

“How much pesticide should I apply?”

“The recommended quantity, depends on the type of crop, timing, frequency of application, the application method and the severity of pests. Look for information on the label or ask for advice. Do not use more than the recommended amount ”.

“Can I use the application equipment loaned to me by another farmer?”

“Yes, but check the equipment and never accept unwashed equipment. You may not know which type of pesticide has been previously used”.



Thoroughly wash exposed parts of the body

DID YOU KNOW THAT

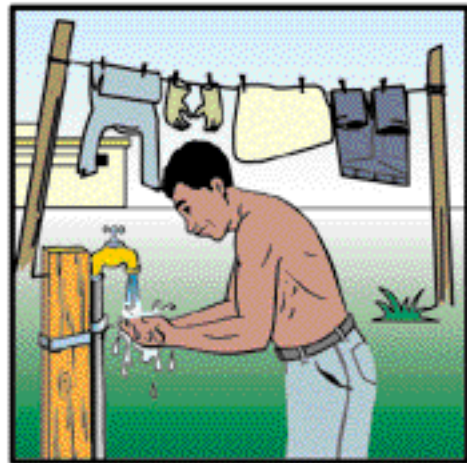
Personal hygiene is extremely important when working with pesticides. So after use, wash at least your face and hands before eating, drinking, smoking or going to the toilet. During work, do not touch the face or other bare skin with dirty hands or gloves.

SPILLAGE

Spillage is hazardous and all possible efforts should be made to avoid it and, if it happens, the problem should be solved immediately through cleaning of the area.



Use absorbent materials and remove it with a brush and shovel



Wash contaminated skin and clothing with abundant water and soap.

IMPORTANT

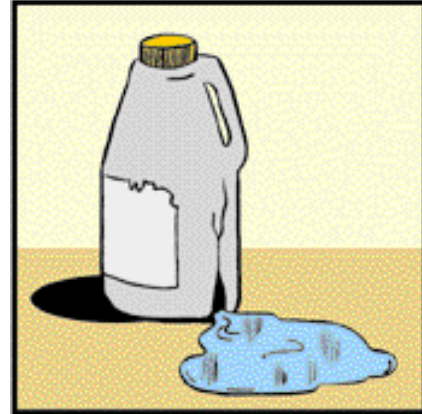
- Spills must be dealt with immediately.
- Always follow the instructions given on the product data sheet.
- Keep other persons, animals and vehicles away from the contaminated site.
- Wear protective equipment.
- Use absorbent materials like dry sand, sawdust or soil to absorb spilled liquids and remove it with a brush and shovel.
- Do not flush away with water.
- Remove a dry powder or granule spillage with a brush and shovel and dispose of it in a safe and approved way.
- Keep sand, sawdust or base soil at hand.

QUESTIONS AND ANSWERS

“How do spills happen?”

“Some typical causes are

- containers damaged by bad handling
- containers punctured by sharp edges during transport
- containers weakened by high temperatures
- not paying enough attention when pesticides are transferred from container to application equipment”.



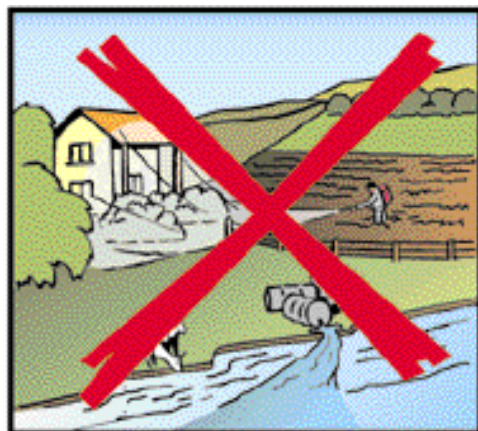
Damaged container



Careless handling

DID YOU KNOW THAT

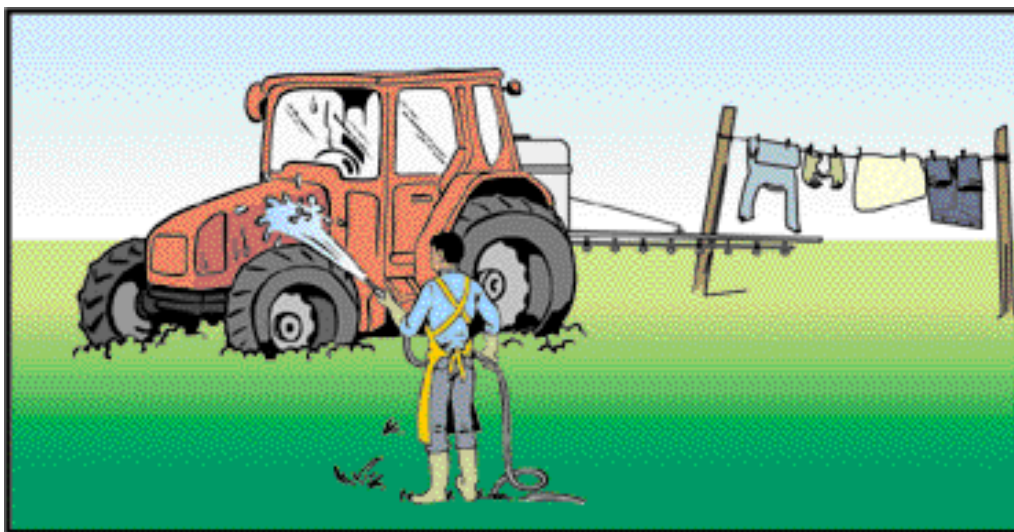
Spillage often causes water contamination because it runs directly into drains, sewers, waterways or ponds. If it happens local authorities should be informed.



Do not contaminate the environment

POST-APPLICATION

The risk of hazardous contamination exists also after the application of the pesticide. Great care is therefore of utmost importance during all the post-application steps, such as cleaning of equipment, disposal of containers and handling of contaminated working clothes.



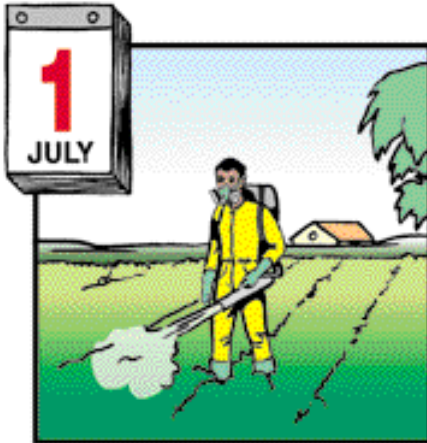
Wash all equipment and clothing after use

IMPORTANT

- Wash the application equipment after use.
- Never rinse pesticides down the drain.
- Wash your working clothes separately from other clothes.
- Do not wash working clothes with other clothes.
- Application equipment should be washed separately from other equipment.
- Take a shower, and use soap.
- In case of skin exposure, wash for several minutes with fresh water.
- Respect the re-entry period.
- Be sure to store unused pesticides safely or return them to the responsible authority.

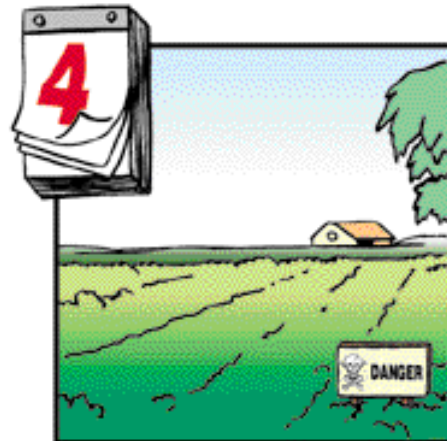
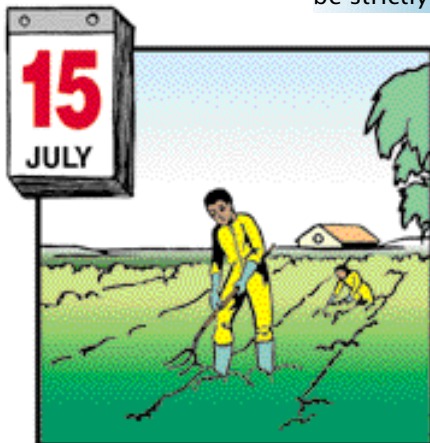
QUESTIONS AND ANSWERS

"What is the re-entry period and the pre-harvest interval?"



"The re-entry period is the time you should wait before entering the field again after the last pesticide application. The pre-harvest interval is the time between the last pesticide application and the harvesting of the crop for eating. Both intervals depend on the pesticide, the application dose and rate and the crop. The intervals may be stated on the specific label or data-sheet."

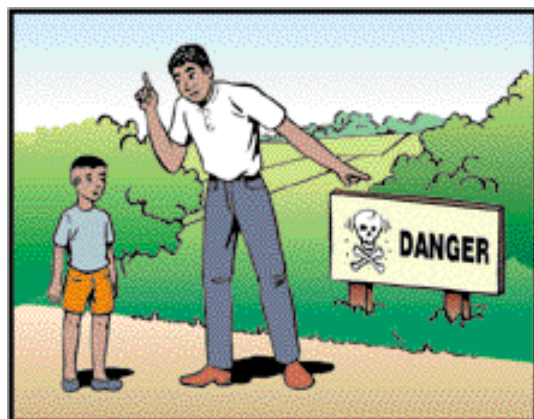
Re-entry period must be strictly observed



DID YOU KNOW THAT

Children may not understand hazard warning signs. If it is likely that they or other persons who are unable to understand the signs may enter the field, other precautions should be taken.

Put warning signs



DISPOSAL

If the container is damaged or left-over, the pesticide outdated or not necessary anymore, then they should be disposed.

FOLLOW THE LEGISLATION FOR DISPOSAL OF PESTICIDES !

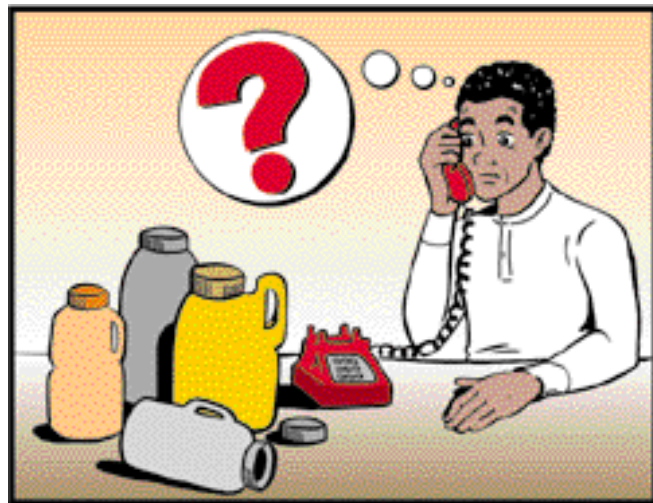
CALL:

Local authority

Address

.....

Phone number



IMPORTANT

- Do not accumulate pesticide waste.
- Do not create risks for people or animals with your pesticide waste.
- Follow label instructions or data sheet to dispose of the materials in a correct and safe way.
- Ask the local authority and the supplier of the pesticide if you have any doubt of how to dispose of the products and their containers.
- All contaminated containers not intended for re-use must be decontaminated and made unusable by puncturing.
- Use protective equipment when disposing of pesticides.
- Keep children away from your pesticide waste.

Contact the local authority for disposal

QUESTIONS AND ANSWERS

"What shall I do with my empty containers?"

"You should destroy or return them"

" Are there any containers which I can not burn?".

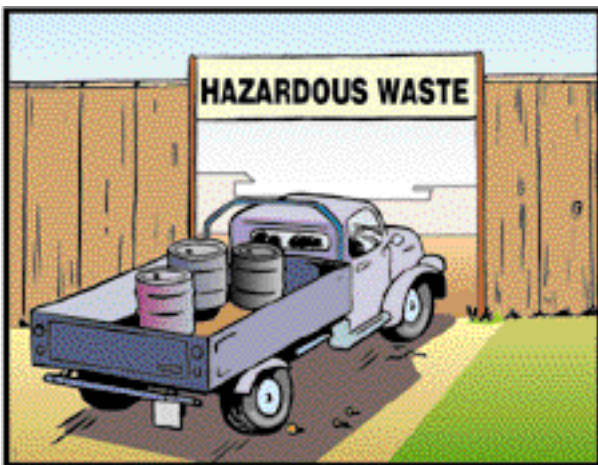
"A range of pesticides are highly flammable and should not be burned under any circumstances. Consult the label, and ask the local authority for advice".

"What shall I do if I can't dispose my containers?"

"Rinse them and store them securely in a way that ensures they cannot be used for other purposes and keep them away from children. Remember an empty pesticide container can never be cleaned completely of pesticide".

DID YOU KNOW THAT

In many countries containers of extremely toxic, toxic and hazardous pesticides, must be disposed of in special places for hazardous waste.



Bring containers to special place for hazardous waste collection

FURTHER INFORMATION

WHO

World Health Organization
Avenue Appia 20
CH-1211 Geneve
Switzerland
Tel: +41 22 791 21 11

ILO

International Labour Office
4, route des Morillons
CH-1211 Geneve 22
Switzerland
Tel: +41 22 799 61 11

FAO

Food and Agriculture Organization of the United Nations
Via delle Terme di Caracalla
I-00100 Rome
Italy
Tel: +39 0657051

ECPA

European Crop Protection Association
Avenue Albert Lancaster 79A
B-1180 Brussels
Belgium
Tel: +32 2 375 68 60

GCPF (formerly GIFAP)

Global Crop Protection Federation
143 Avenue Louise
B-1050 Brussels
Belgium
Tel: +32 2 542.04.10

EPA

Environmental Protection Agency
401 M Street, SW
Washington, DC 20460-0003
USA
Tel: +1 (202) 260-2090

NIOSH

National Institute for Occupational Safety and Health
4676 Columbia Parkway
Cincinnati, OH 45226-1998
Tel: +1-800-553-6847

ICPS

International Centre for Pesticide Safety
Via Magenta 25
I-20020 Busto Garolfo (MI)
Italy
Tel.: +39-0331406611

OSHA-US DOC

Room N3647

Constitution Ave, NW

Washington DC 20210

USA

Tel.: +1-202-219-8021

USDA

14th Independence SW

Washington DC 20250

USA

Tel.: +1-202-720-2791

FDA

National Center for Toxicological Research

5600 Fishers Lane

Rockville MD 20857

USA

Tel.: +1-301-443-3170

FURTHER READINGS

Reigart and Roberts, 1999: Recognition and management of pesticide poisonings. U.S. Environmental Protection Agency.

WHO, 1985: Safe use of pesticides, Technical Report Series 720. World Health Organization.

WHO, 1990: Public health impact of pesticides used in agriculture. World Health Organization.

WHO, 1997: Management of poisoning. World Health Organization.

FAO, 1990: Guidelines - For personal protection when working with pesticides in tropical climates. Food and Agriculture Organization of the United Nations.

Global Crop Protection Federation Guidelines:

- Guidelines for emergency measures in cases of crop protection product poisoning.
- Guidelines for the safe transport of crop protection products.
- Guidelines for the avoidance, limitation and disposal of pesticide waste on the farm.
- Guidelines for the safe and effective use of crop protection products.
- Guidelines for personal protection when using pesticides in hot climates.
- Guidelines for the safe warehousing of crop protection products.