



**PESTICIDES IN ZIMBABWE**

Toxicity and Health Implications

*Edited by*  
*Charles F. B. Nhachi*  
*and*  
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# Pesticides and the Agricultural Chemicals Industry Association

*Trish Mbangwa*

### Summary

The Agricultural Chemicals Industry Association (ACIA) represents the manufacturers and distributors of agrochemicals and animal health products in Zimbabwe. ACIA is also a member of the International Group of National Associations of Agrochemical Manufacturers (GIFAP). Through GIFAP, ACIA has endorsed the Food and Agriculture Organization's Code of Conduct on the distribution and use of agrochemicals. Members of ACIA are expected to adhere to the legislation and regulations governing the proper use of agrochemicals as stipulated by the Department of Research and Specialist Services and the Drugs Control Council. ACIA also assists in implementing the Code of Conduct on the distribution and use of agrochemicals by training farmers and workers on the proper and safe handling of agrochemicals. Knowledge of the probable health effects of agrochemicals is also a concern of ACIA.

The Agricultural Chemicals Industry Association (ACIA) represents all the manufacturers and distributors of agrochemicals and animal health products in Zimbabwe. All chemicals are brought into the country only after they have been registered with the Department of Research and Specialist Services, a government body which ensures the standards and efficacy of all products entering Zimbabwe are adhered to (Government of Zimbabwe, 1977). In addition, the Hazardous Substances and Articles Control Board, the drug regulatory body in Zimbabwe, exercises strict control on pesticides and ensures that unsafe or substandard chemicals are not registered. A detailed legislative process, careful Government monitoring and committed agrochemical supplier co-operation combine to ensure one of the safest and best regulated agrochemical industries in the world.

Legislation and its effective implementation by the Department of Research and Specialist Services has prevented unwanted agrochemicals from entering the country and has kept highly poisonous pesticides from being used irresponsibly. The legislation further ensures that only pesticides whose efficacy and toxicity have been thoroughly investigated and found effective and safe will be sold. Further safety is ensured by the Agricultural Chemical Input Priority Committee which determines which pesticides will receive a foreign currency allocation and that the correct quantity of each pesticide will be imported.

The purpose of the detailed registration process is to ensure safe and efficient use of pesticides in the interest of the user, the farmer, the consumer and the general public who are concerned about hazards in handling, residues, food, and possible contamination of the environment.

Close co-operation between the Plant Protection Research Institute and the agrochemical companies in Zimbabwe is essential to the entire registration process and ensures its success.

Information on physical properties and toxicology of the product is accepted by the Institute from recognised independent published sources. Claims for the control of agricultural and horticultural pests accepted by the agricultural departments in countries with similar climates to our own are viewed favourably, although there are very few countries falling into this category. Experimental data in support of claims made must be derived from experimentation stretching over at least three seasons with research conducted under varying climatic conditions within the country. Claims for the control of greenhouse and household pests also have this testing requirement.

When crops are sprayed from aircraft, farm workers are sometimes used as ground markers. These workers must wear protective clothing. For purple and red triangle pesticides, a ground marker must wear a waterproof jacket, a pair of waterproof trousers, rubber boots, gloves, a hood and face shield. For amber and green triangle pesticides, a ground marker must wear a long-sleeved overall, rubber boots and a face shield.

ACIA is a member of the international trade organization, GIFAP, of which no private broker can become a member, thus further ensuring the safety of users and consumers. Not only do Zimbabwean suppliers of agrochemicals adhere to the legislation, they also provide a team of responsible professionals, including experienced technicians and scientists, who not only evaluate and sell agrochemicals, but also provide the farmer with much needed, specialized after-sales service.

Through GIFAP, the Association has unanimously endorsed the Food and Agricultural Organization's code of conduct on the distribution and use of agrochemicals and it is now up to all members to adhere to this Code.

The Code aims at setting out the responsibilities and standards of conduct for all public and private entities engaged in or affecting the distribution and use of pesticides. It promotes practices which encourage the safe and efficient use of pesticides, including minimizing adverse effects on humans and the environment and preventing accidental poisoning from improper handling.

The Code further seeks to ensure that pesticides are used effectively for the improvement of agricultural production and of human, animal and plant health. The Code is designed to be used, within the context of national law, as a basis whereby Government authorities, pesticide manufacturers, those engaged in trade and any citizens concerned may judge whether their proposed actions and the actions of others constitute acceptable practices.

Agrochemicals in Zimbabwe are sold in a paper, plastic, glass and steel containers ranging from bottles to drums, and cartons to boxes. It is a legal requirement that all such containers must be completely destroyed after use. The label on every container clearly states that the safe disposal of the empty containers is required by law. Safe disposal is essential and is viewed by ACIA as an important part of the overall responsibility of every person involved in the handling and application of agrochemicals.

All agrochemical containers distributed in Zimbabwe are clearly labelled. The labels are fixed to the containers with the best available quality glue and are designed to withstand washing and exposure to rainfall. However, in the case of the label being removed from the container there is no method, other than in the case of large drums which have the product name stencilled on, to identify the contents of the container. For this reason the public is discouraged from using any container without a label or any container whose contents they are unsure of.

Because of the variety of agrochemicals available and the variations in the levels of literacy, training and supervision, some farmers may not always be able to read or understand the warnings and advice on the label (Bwititi, 1983). To help overcome these problems, a set of pictograms for use on agrochemical labels has been evolved by GIFAP, in cooperation with the Food and Agricultural Organizations (FAO) and is currently in use in Zimbabwe.

A major constraint to the use of pictograms is the limited space on product labels. Consequently, the number of messages that can be communicated has to be restricted. This has required careful ranking of warnings and advice in order of importance, based on practical experience in the field and on reports in published literature.

The final designs for the pictograms were chosen following a worldwide survey of about 1 000 farmers from 42 countries. This showed that people of various of cultural backgrounds and levels of literacy had a high level of understanding of the messages intended to be conveyed by the pictograms (Nhachi and Kasilo, 1993).

Large quantities of unwanted pesticide stocks have accumulated over the years in various countries. For example, estimates for the African continent alone run into thousands of tonnes. Many of the products are old, deteriorating in quality and occasionally present a potential health and environmental risk from leaking containers. In many instances, inadequate storage facilities have added to the problems of containment and the associated risks (Bwititi and Loewenson, 1987).

To dispose of the materials in a safe and responsible manner, it is first necessary to identify fully the products concerned and to ensure they are safely packed, or over-packed, and are properly labelled.

The clean-up of contaminated storage areas and the removal and disposal of contaminated soil and deteriorated packaging will also have to be considered.

In order to be able to make proper arrangements for transport and disposal, stocks of unwanted products must always be inspected to assess the physical

state of the containers and to identify the contents. As much information as possible should be obtained about the stock before inspection is carried out by experts.

### **Production ownership**

The responsibility for disposal generally resides with the owner or custodians of the unwanted stock and ownership must therefore be ascertained.

Similarly, wherever possible, the original manufacturer of individual products should be identified so that details of composition and a Material Safety Data Sheet be obtained.

### **Production identification**

As far as can be ascertained, the active ingredient and composition of each product should be established using information from the original supplier or manufacturer.

### **High temperature incineration**

Incineration is the preferred method for the safe disposal of the majority of unwanted pesticides which cannot be used or recycled. It is a high temperature thermal oxidation process. However, there are some pesticides which either cannot or should not be incinerated. The former include inorganic materials and the latter include those organic products containing heavy metals such as mercury and lead. Advice on whether a product is suitable for incineration can be found in the Material Safety Data Sheet or can be obtained from the product manufacturer or a reputable incinerator operator.

The primary aims of incineration are to break down the pesticides into inorganic products (solids and gases) and to avoid the formation of new hazardous compounds. Efficient incineration requires both a good supply of oxygen and the three Ts of combustion, namely: temperature, time and turbulence. The higher the temperature at which the pesticide is burnt, the more completely it will be destroyed. Chlorinated pesticides are among the most difficult products to incinerate and temperatures of around 1100–1200°C are required for their destruction.

The longer the time the pesticide is held at high temperature, the greater will be the degree of destruction. The residence time of the gas phase is of particular importance and at least two seconds is generally considered necessary.

The higher the degree of turbulence in the incinerator, the higher is the destruction efficiency. This is because there is more intimate contact between the product and oxygen in the combustion air and a reduced likelihood of significant temperature gradients.

Incineration may take place either in dedicated purpose-built facilities or in suitably adapted existing high-temperature process plants such as cement kilns. Thus, co-incineration of hazardous wastes in existing facilities such as cement kilns may be a practical approach for many developing countries.

Although some members of ACIA have installed incinerators municipal-controlled landfill is the method of disposal currently in practice in Zimbabwe.

GIFAP recently embarked on an exercise to stimulate pesticide associations and companies to ensure that suitable protective clothing is made available to all those who handle pesticides, particularly in hot and humid climates such as our own, in the belief that all companies involved in the production, sale and application of pesticides share a responsibility to help end-users handle and apply pesticides safely.

In conclusion, therefore, one of the responsibilities of the ACIA in Zimbabwe is, *inter-alia*, to assist in implementing the FAO's Code of Conduct on the safe use of agrochemicals.

## References

- Bwititi, T. (1983) Report of a survey carried out on the storage, use and disposal of pesticides. Mimeo. Harare.
- Bwititi, T. and Loewenson, R. (1987) Pesticide safety in farm communities. Mimeo. Harare.
- Government of Zimbabwe (1977) Pesticide Regulations, In: Rhodesia Government, Notice No 10, Government Printers, Harare.
- Nhachi, C.F.B. and Kasilo, O.M.J. (1993) Organophosphate poisoning. In: P. Cheremisinoff. (ed). *Encyclopedia of Environmental Control Technology*, Volume 7. Gulf Publishing Co., Hasbrouk Heights. pp 87-97.





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